

Environmental
Report

04



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Environmental
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Letter from the Chairman





The conservation of the environment and the respect for the international environmental protection agreements are two of the main priorities of Enagas' activities.

The Kyoto Protocol, ratified internationally in 2004, entails the reduction of greenhouse gas emissions. Enagas contributes to Kyoto Protocol compliance by providing Enagas users with cleaner fossil fuels and by monitoring the emissions of its facilities.

This approach is the result of the conviction that the sustainable development that guarantees the future of our society is in the hands of those of us who, directly and indirectly, serve as role models in terms of our environmental behaviour and the contributions we make.

In keeping with this commitment, Enagas plans its operations by taking the protection of the environment into consideration in all of its activities by:

- Increasing its pipeline network so that this fuel is available throughout Spain, thus facilitating access to a larger number of users.
- Investing in preventive, corrective and protective environmental measures aimed at protecting the environment and minimising the impact on the environment caused by Enagas projects.
- Implementing the best technology available in all of its facilities.
- Informing employees and raising their awareness of the impact their activities have on the environment.
- Requiring explicit compliance with environmental legislation from its providers and contractors.

A commitment to personal values, along with employees' high degree of skill and dedication has allowed Enagas to position itself as a leading company and proceed to continuously upgrade its activities, endorsed by the environmental management system certification in each of the Company's facilities.

The results of the environmental management system applied to all corporate activities, compliance with applicable legislation and the commitment to the protection of the environment figure in this report, which I have the great pleasure of presenting to you.

Antonio González-Adalid
Chairman





The Enagas
Group



Enagas
Infrastructure Map



↗ The Enagas Group

The Enagas Group

As the gas system technical manager, Enagas is responsible for guaranteeing the supply of natural gas in Spain. This goal is achieved by ensuring the expansion and maintenance of the high-pressure pipeline network (>70 bar) and the proper coordination between entry points, storage facilities, transport and distribution, thus giving continuity to an activity initiated in 1972.

Enagas, as the leading company in gas transport, provides third party access to network services to commercialisation

companies operating in the liberalised market; Enagás is also responsible for the supply of gas to the tariff market.

In order to ensure compliance with its obligations, Enagas has implemented the following infrastructure:

- Three regasification plants located in Barcelona, Cartagena and Huelva, which have undergone continuous expansion in recent years.
- 7,158 km of pipeline, designed to operate in high-pressure transport.
- 11 compression stations with an installed power of 226,946 HP and 291 regulation and measuring stations.

- 29 operation and maintenance centres from which the monitoring and maintenance of transport facilities are carried out.
- The underground storage of gas in Serablo (Huesca), which guarantees gas storage in times of great market demand.
- The Technology Unit located in Zaragoza that supports technological progress, from which the development of research projects, innovation and tests related to gas and control equipment are carried out according to standards and regulations in effect.
- The main control centre, for the operation, supervision and monitoring of the gas system.

The Company's executive bodies are found in its headquarters and are structured around three general areas:

- Infrastructures and operations, safety, supply guarantee and efficiency in technical, commercial and infrastructure operation.
- Technology, engineering and environment, with the mission to develop the new infrastructures planned and ensure that their established construction period and costs are not exceeded.
- Strategy and regulation, which interacts with the administration, shareholders and other interested parties. Its main objective is to guarantee a stable regulatory framework.

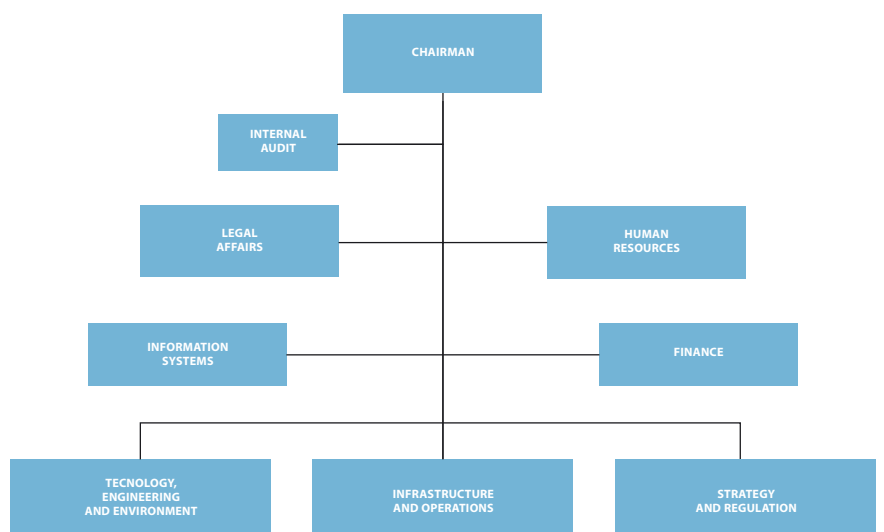
The operation and management of these facilities enabled the transport of 319,599 GWh in 2004, entailing a 16.1% increase compared to the previous year.

The vast majority of gas supplies which are later transported through the net-

work are imported from other countries in the form of:

- Liquid Natural Gas (LNG), which is unloaded in the regasification plants of Huelva, Cartagena and Barcelona.
- Natural Gas (NG) through the Maghreb pipeline and the Larrau international connection.

THE ENAGAS GROUP	
	Stake (%)
Enagás International Finance, S.A.	100.00
Gasoducto Al-Andalus, S.A.	66.96
Gasoducto de Extremadura, S.A.	51.00
Gasoducto Campo Mayor-Leira-Braga, S.A.	12.00
Gasoducto Braga-Tuy, S.A.	49.00

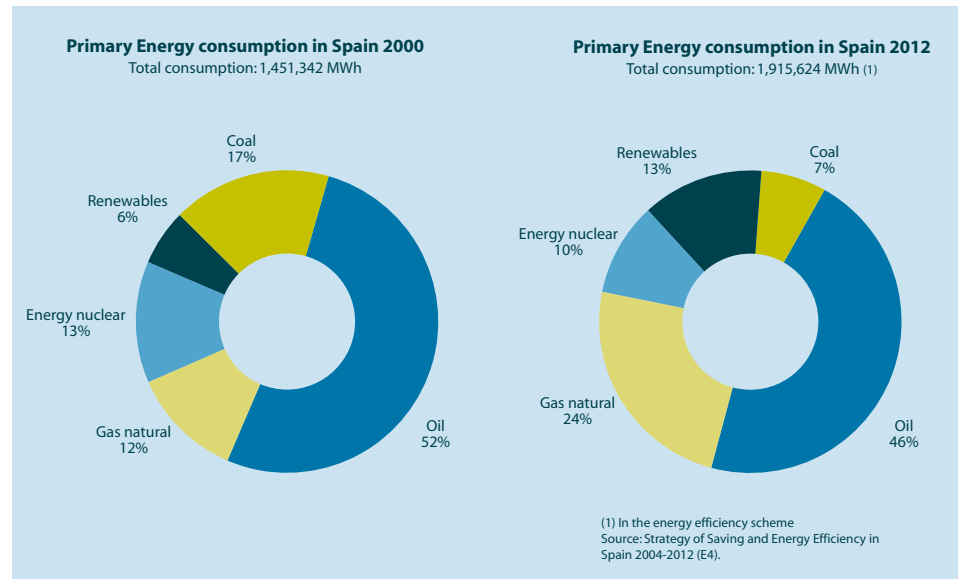
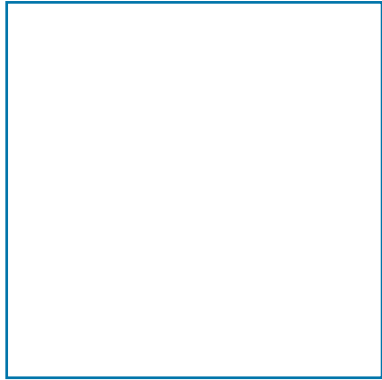






The Energy Demand in the 21st Century





↗ The Energy Demand in the 21st Century

The Energy Demand in the 21st Century

Current economic development is giving way to a significant increase in energy demand. In order to ensure the sustainability of this development, it is necessary to promote the use of primary energy sources which produce the lowest incidence of impact on the environment possible. Natural gas is the fossil fuel that creates the least environmental impact throughout its life cycle and especially during its use. Furthermore, its proven reserves guarantee a supply for a period of 60 years

considering the present rate of consumption, compared to the 40-year supply offered by oil.

For this reason, international efforts aimed at protecting the environment are one of the most influential factors for energy production.

The Spanish Government recently released Estrategia de ahorro y eficiencia energética en España 2004 - 2012 (E4) (Strategy of Saving and Energy Efficiency in Spain 2004-2012), which analyses the current situation as well as its evolution through 2012 and establishes the energy policy.

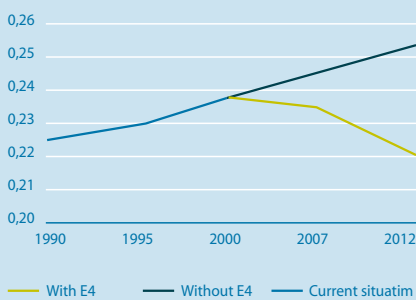
Thus, the demand forecast through 2012 shows no change in nuclear energy figures and illustrates a shift from coal to natural gas, oil and renewable energy sources. The demand for natural gas in 2012 is predicted at some 454,000 GWh, which represents 23.7% of primary energy consumption in Spain.

The strategy of saving and energy efficiency is built upon three fundamental pillars: guaranteeing supply, improving competitiveness by efficiently

This plan seeks to meet the natural gas demand and establish criteria for the efficient development of supply networks, ensuring the availability of this energy resource throughout Spain.

The planning of the electricity and gas sectors involves all agents that participate in these markets.

In this situation, natural gas is positioned as the primary energy source with the greatest medium-term growth potential. A large part of this growth can be attributed to the increasing use of natural gas in



Source: Strategy of Saving and Energy Efficiency in Spain 2004-2012 (E4).

➤ ELECTRICITY GENERATION PLANNING

Installed power (MW)	2002	2011
Wind	4,600	13,000
Cogeneration	5,500	7,100
Combined conventional and gas turbines	2,800	14,800

Source: Strategy of Saving and Energy Efficiency in Spain 2004-2012 (E4).

employing energy resources and promoting the protection of the environment.

A cumulative energy savings of 813,519 GWh from 2004-2012 as well as a decrease in the country's energy intensity rate is expected. Furthermore, this savings will entail an associated annual decrease of 42 million tons of CO₂.

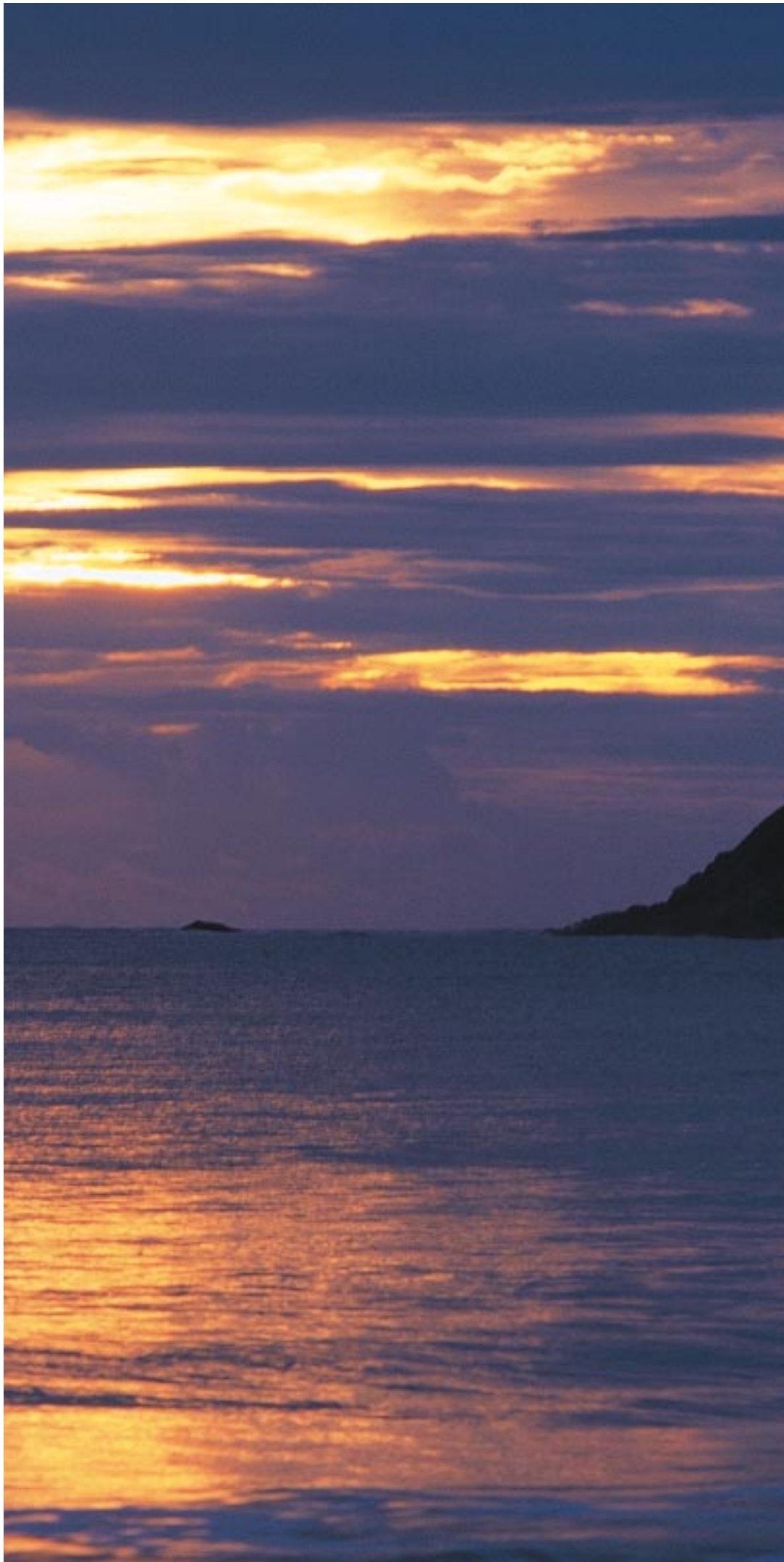
One of the necessary instruments for compliance with the objectives of the aforementioned strategy is the Planificación de los sectores de electricidad y gas 2002-2011 (Planning in the Electricity and Gas Sectors 2002-2011).

combined conventional and gas turbines (CCGT).

Presently, these turbines represent the most advanced technology available in electricity generation and allow a balance between socio-economic growth and the protection of the environment.

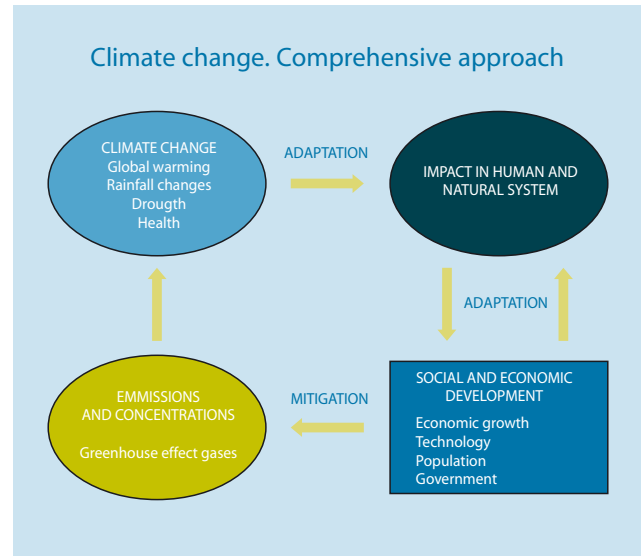
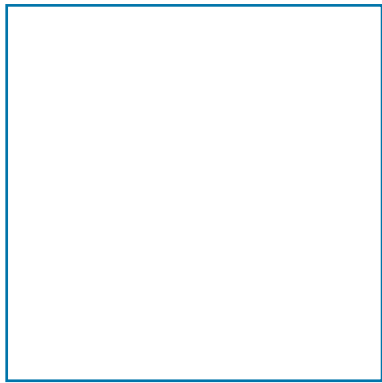




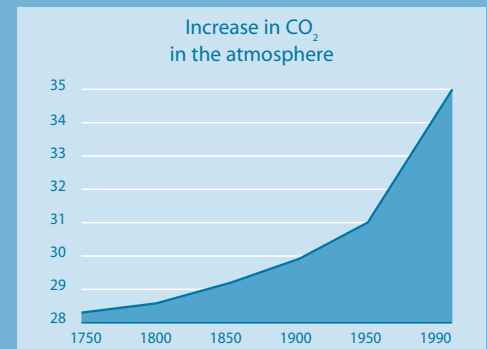


The Kyoto Protocol





↗ The Kyoto Protocol



The Kyoto Protocol

The greenhouse effect is caused by gases in the atmosphere that allow solar radiation to enter and absorb infrared radiation emitted by the Earth's surface, preventing the release of this energy into the atmosphere. The accumulation of these gases in the atmosphere produces an increase in the average temperature of the Earth's surface, affecting global climate; this is known as climate change.

Climate change is one of the most serious threats posed to the environment in our era and entails a major obstacle to the

economic and social development of future generations.

Thus, it is essential to promote sustainable growth models in which energy and industrial policies envisage the most suitable options for limiting greenhouse gas emissions.

The Kyoto Protocol, approved in 1997 and ratified in 2004, holds as its objective the effort to act against climate change by way of international action taken to reduce greenhouse gas emissions.

The protocol introduces three mechanisms which enable the objectives to be met and ensure compliance with the obli-

gations to reduce greenhouse gas emissions:

- *Emissions trading (trading of emissions rights)*: creates the opportunity for developed countries to trade emission units.
- *Clean development mechanism*: a country with a commitment to reducing emissions invests in the execution of a project designed to reduce greenhouse gas emissions in a developing country. The investing party will receive emission credits for the emissions that have been avoided.
- *Joint implementation*: similar to the previous mechanism, but applicable to countries that have commitments to reducing emissions. The investor country obtains emission units and the receiving party deducts these units.

Climate change is considered a priority for action by the European Union and as a

result, its member countries have committed to reducing their greenhouse gas emissions by 8% between 2008 and 2012, as compared to their emission levels in 1990.

Consequently, the European Commission has adopted a series of directives which the Spanish government has incorporated through the enactment of the following legislation:

- Royal Decree Law 5/2004 of 27 August, in which emissions trading regulations are established.



↗ GREENHOUSE EFFECT GASES

Gas	Effects	Main emissions by human activity (*)
Carbon dioxide (CO ₂)	Main responsible for global warming	Burning of fossil fuels
Methane (CH ₄)	More potential of global warming than CO ₂ but lower concentration in the atmosphere	Agriculture, rubbish dumps, etc.
Nitrous oxide (N ₂ O)	High global warming potential although low concentration in atmosphere	Burning of fossil fuels and fertilizers
Fluorogases: - Hydrofluorocarbons (HFC) - Perfluorocarbons (PFC) - Sulphuric hexa fluoride (SF ₆)	Global warming	Aerosols, coolers, production of aluminium

(*) CO₂, CH₄ y N₂O are also generated in natural processes: respiration, vulcans, oceans, etc.

The Kyoto Protocol

- Royal Decree 1866/2004 of 6 September, by which the national emissions trading assignment plan for 2005-2007 was approved. This plan, with a validity of three years, establishes the methodology of individual allocation of emissions trading and has as its objective the stabilisation of emissions at the average recorded during the past few years.

These regulations, along with the Strategy of Saving and Energy Efficiency in Spain 2004-2012 (E4), seek to implement

sustainable economic and social development.

Enagas' commitment

The use of energy sources is a critical element in the economic development of all social groups, as one of the factors which most negatively impacts the global environment, mainly as a result of carbon dioxide emissions.

The use of natural gas as a primary energy source generates carbon dioxide emissions which are 30%-50% lesser than those emitted by other fossil fuels, given that its molecular composition is that of the lowest carbon-hydrogen ratio.

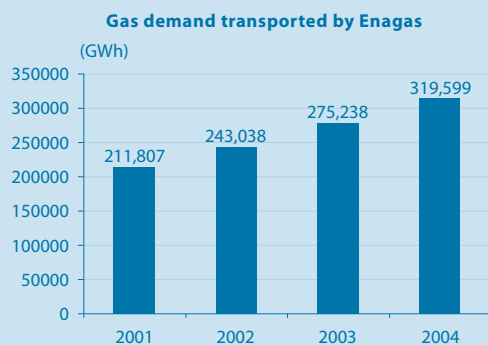
Enagas, in its policy to facilitate the use of this fuel to the greatest number of users, contributes to the reduction of these emissions throughout Spain.

From 2000-2003, primary energy consumption in Spain increased by 9.2% and natural gas consumption experienced a 39.6% increase. This implies the substitution of other fossil fuels with greater carbon dioxide emitting potential for natural gas.

This entailed, considering that coal and oil derivatives are replaced in equal parts, a CO₂ emissions reduction of 6,300,000 tm, representing an 86.88 tm reduction of CO₂ for every GWh of natural gas used.

In 2004, Enagás transported 19,599 GWh of gas, entailing a 16.1% increase with respect to 2003.

58,733 GWh of natural gas were transported for the generation of electrical energy in the CCGT plants, entailing a



the actions necessary to adhere to the commitments outlined in the Kyoto Protocol.

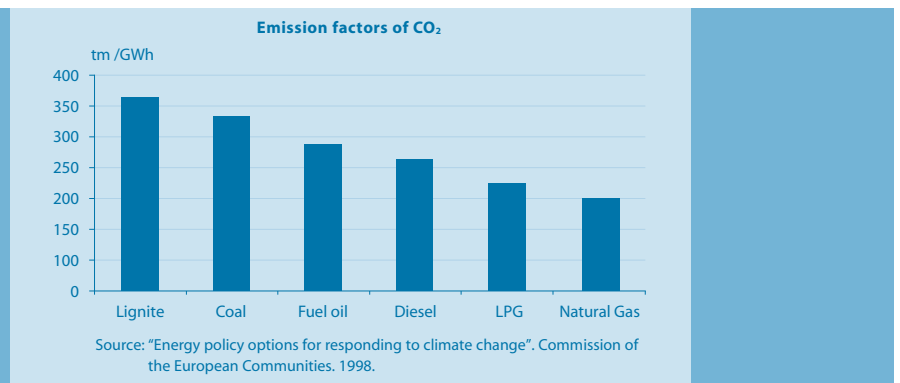
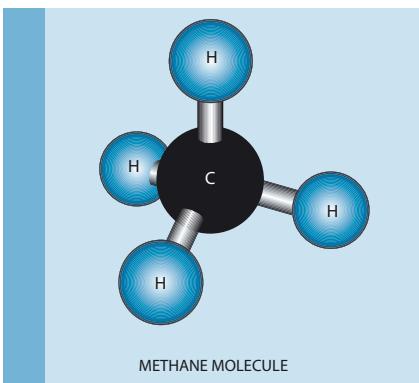
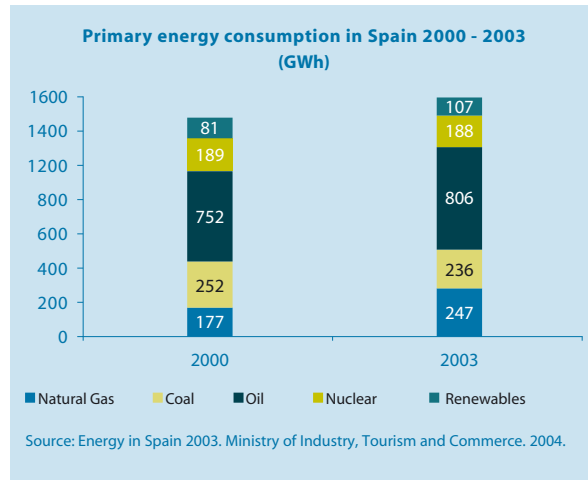
In *Strategy of Saving and Energy Efficiency in Spain*, the use of natural gas is consolidated, due to its composition and efficiency, as one of the main measures enacted to achieve the programmed energy saving objectives.

Furthermore, the increase in natural gas use, particularly in electricity generation by means of CCGT, will enable the reduction of greenhouse gas emissions and will allow for more effective efforts against climate change, thus ensuring

88.8% increase with respect to the previous year.

The increased output of thermal power stations compared to conventional plants involves a carbon dioxide emission reduction of approximately 40%.

However, in 2004, environmental management implemented in Enagas allowed for the reduction of the two greenhouse gas emissions which are present in its activities: carbon dioxide from combustion plants and methane emitted in certain operations necessary to



maintain security conditions in specific facilities.

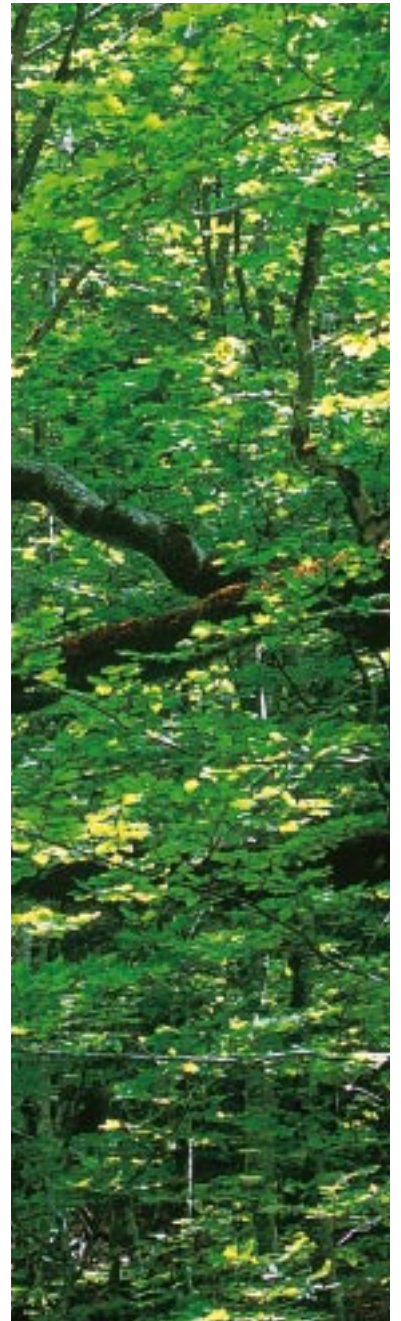
The control and rationalisation of internal energy consumption, the implementation of improved technologies and intensified efforts in maintenance activities in the facilities situated carbon dioxide emissions for 2004 at 301,890 tm of CO₂ per GWh transported. This represents a 13.6% decrease compared to 2003.

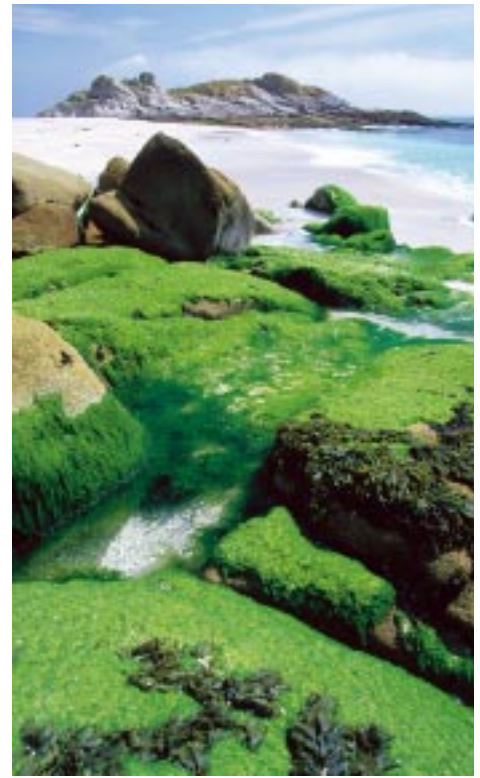
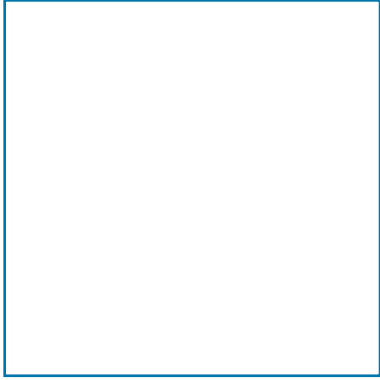
Developments undertaken to control and limit CH₄ emissions have situated these emissions at 19,417 tm, representing 0.085% of the total amount of gas transported in 2004.



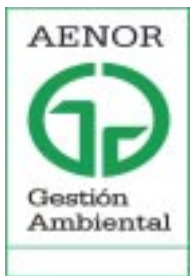


Environmental Management at Enagas





↗ Environmental Management at Enagas



Environmental Management at Enagas

Enagas is committed to incorporating environmental protection measures into its corporate management scheme in order to contribute to society's sustainable development.

As a result, the Company has established an environmental policy which has created an organisation to deal with environmental issues related to its activities, and features an environmental management system in its facilities.

This system has been implemented according to the requirements established in the UNE EN ISO 14001 standard at the following facilities:

- Regasification plants in Barcelona, Cartagena and Huelva
- Underground storage facility in Serrablo
- Department of Transport
- Technology Unit

As of 2002, all of these facilities and every activity undertaken in the same have a corresponding certificate of environmental management granted by AENOR.



Similarly, Enagas identifies and analyses the environmental impact produced by its infrastructure projects and conducts an exhaustive monitoring of this impact during the execution of the projects.

Environmental policy

The conservation of the environment is one of Enagas' operational objectives. Subsequently, Enagas expresses and assumes the following commitments and environmental principles:

Environmental Commitment

To develop its activities in a manner which respects the environment, paying special attention to the protection of the environment, its clients and the general public.

Environmental principles:

Minimise impact

To make a continuous effort to identify and improve the environmental impact resulting from its activities and facilities and to ensure their efficient use.

Continuous adaptation to applicable regulations

To comply with the environmental legislation applicable to its facilities and activities. To take into account international standards and legislative trends when planning those actions which may have a significant environmental impact, especially in those areas where no applicable legislation exists.

Contamination prevention and evaluation of potential risks

To apply the fundamental principle of contamination prevention and evaluation of potential risks, from planning and decision evaluation to the execution and operation of new projects.

Environmental collaboration

To collaborate, where necessary, with different administrations, non-government organisations, and public and private entities to find solutions for the environmental problems posed.

Incorporation of environmental criteria relative to contractors

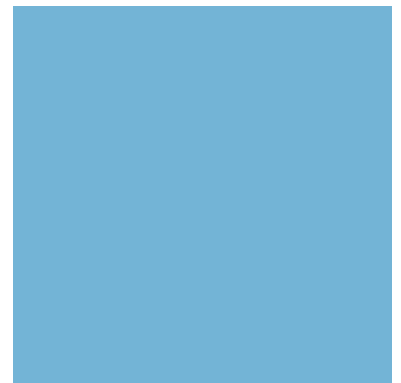
To incorporate environmental criteria when making decisions about the awarding of service and product contracts, as well as to communicate applicable procedures and requirements to contractors working with Enagas.

Environmental communication and information

To assist internal and external environmental communication using the criterion of transparency, informing all employees and the general public of objectives achieved and works in progress relative to the monitoring of environmental issues.

Continuous improvement

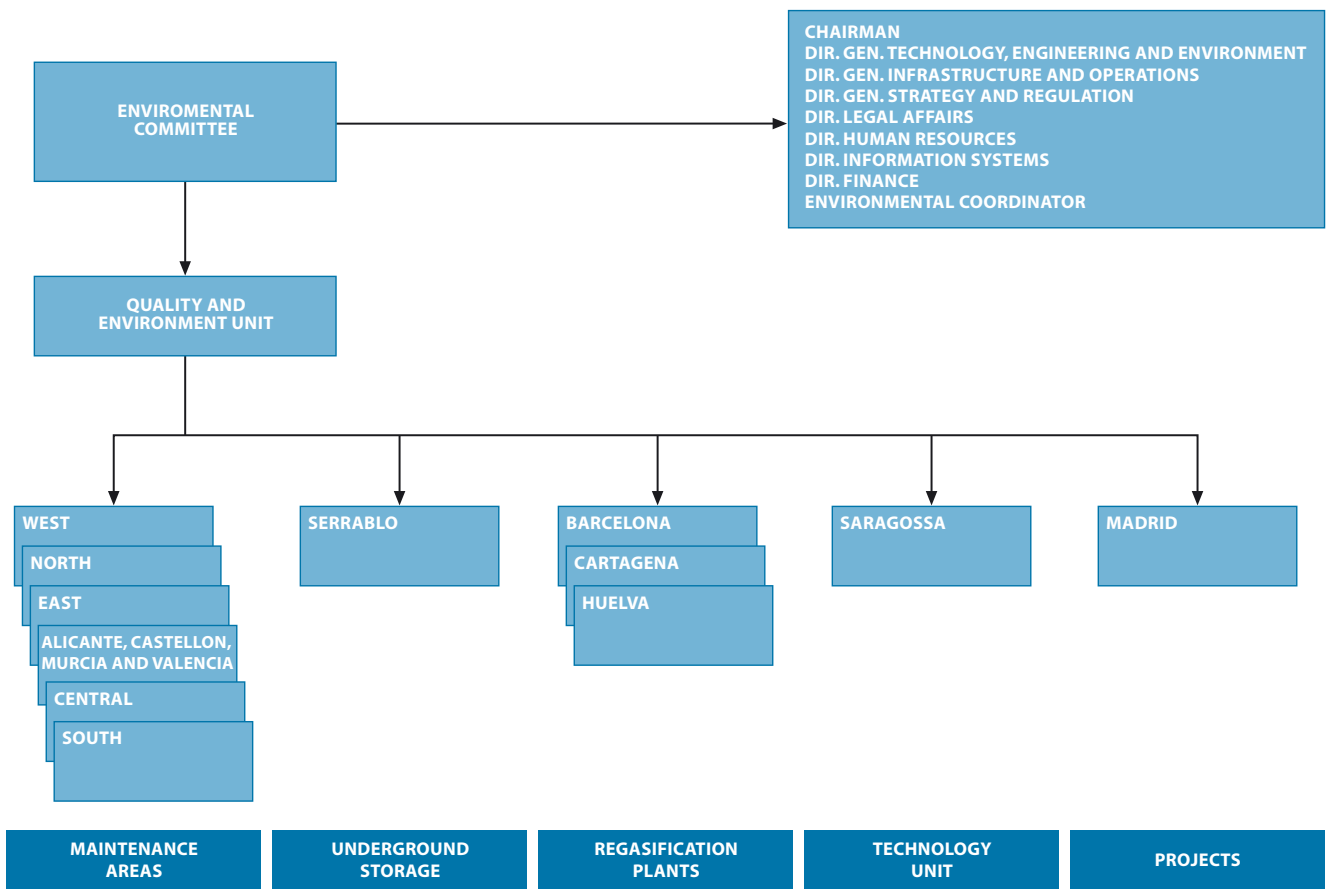
To ensure continuous improvement by systematic and periodic environmental evaluation of the Environmental Management System, for which end the conducting of environmental audits will be considered a fundamental tool.



Environmental Management at Enagas

Organisation

In order to fulfil the commitments stipulated in its environmental policy, Enagas has formed an Environmental Committee, comprised by the Company's executive management, which establishes and approves basic operating regulations, oversees the Quality and Environment Unit responsible for development, implementation and monitoring of the environmental management system, obtains appropriate certificates and ensures compliance with applicable legislation by projects, facilities in operation and environmental groups responsible for implementing these regulations.



Environmental management system

The Environmental Management System is responsible for monitoring environmental issues in operating facilities.

The system is equipped with documentation which enables Enagas to observe, review and update its environmental policy. This documentation is comprised of:

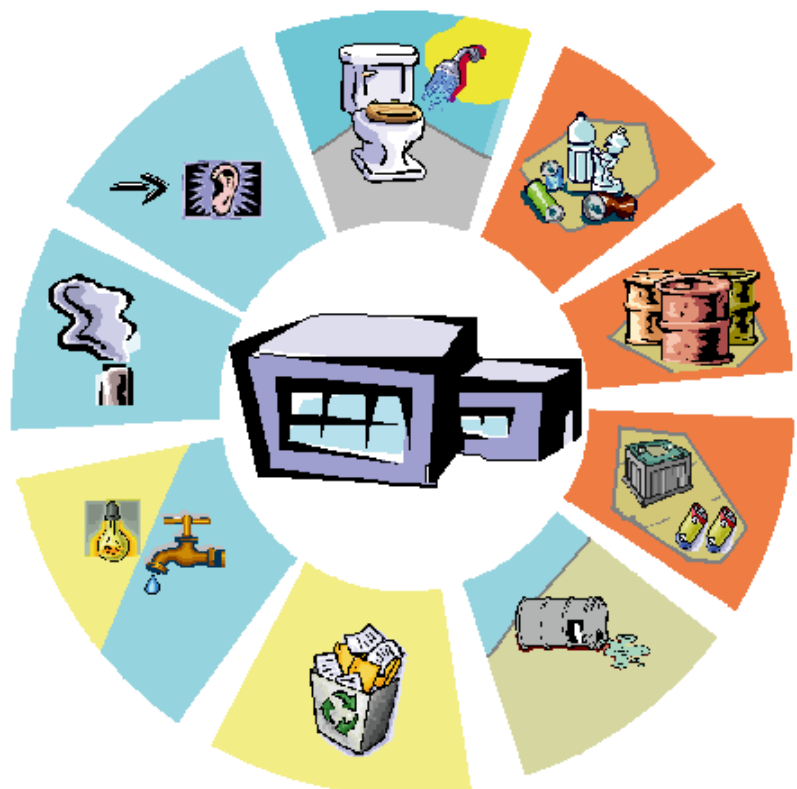
- The Environmental Manual, the frame of reference, which includes basic policy, functions and responsibilities.
- General environmental procedures, which describe the methods to be employed to monitor the environmental aspects of all operations carried out in Enagas facilities.
- Specific procedures and technical instructions, which detail the activities that must be monitored and the responsibilities within a unit or facility.

The following are the environmental aspects monitored:

- Emissions to the atmosphere: natural gas and gaseous pollutants emitted at the combustion source. Periodic maintenance programmes are established for the control and reduction of these emissions. These programmes ensure the proper operation of the facilities that generate these emissions, and conduct measurements and inspections for quantification purposes.
- Residual water discharges: this consists of sewage water, cooling water and rainwater. Programmes designed to monitor the optimal operation of the treatment systems are drawn up yearly, thus guaranteeing minimal environmental contamination.

Environmental Technical Instruction CARTAGENA REGASIFICATION PLANT ENVIRONMENTAL MONITORING PLAN 2004							
ANNEX 1							
EMMISSIONS MONITORING PROGRAM							YEAR 2004
Emission source	Classification	Process	Parameters to control	Type control	Due Dates	Ext/Int Inspection	Methodology equipment
Foco 1	C	Caldera 1 (YGNIS n.º serie 4420048)	CO NO _x				
Foco 2	C	Caldera 2 (YGNIS n.º serie 4420048)	Opacidad	Autocontrol	4.º trimestre 04	Externa	–
Foco 3	C	Caldera 3 (YGNIS n.º serie 4420047)	CO ₂ O ₂ CO				
Foco 4	B	Vaporizador PA-216	NO _x				
Foco 5	B	Vaporizador PA-226-A	Opacidad	Autocontrol	4.º trimestre 04	Externa	–
Foco 6	B	Vaporizador PA-226-B	CO ₂ O ₂				

- Waste: separated into reusable, recyclable, hazardous, urban and assimilable and inert. Each type of waste, according to the conditions established by law, is delivered to an authorised manager through a collection and transport service. Similarly, quarterly inspections are conducted in order to check the adequacy of storage conditions.
- Energy consumption: mainly from electricity and natural gas. This consumption is measured and recorded, and actions are defined for its reduction.
- Noise: generated by the operation of the facilities. A programme is developed yearly to determine the impact of noise levels produced by the facilities



Environmental Management at Enagas

and, as appropriate, corrective measures are formulated.

- Soil contamination: this is a potential issue which may originate from spills, leaks or escapes of hazardous substances. In order to prevent these episodes, hazardous materials are located in impervious, preferably covered, areas which detail containment measures and establish guidelines for the correct handling of these substances.

The results obtained from the monitoring of all of these environmental issues assist in the establishment of objectives designed to improve the different units. These objectives, along with the more general corporate targets and the assignment of responsibilities and resources to meet this end, constitute the strategic environmental plan.

These objectives, defined in a series of activities, enable Enagas to improve its environmental behaviour and comply with environmental policy.

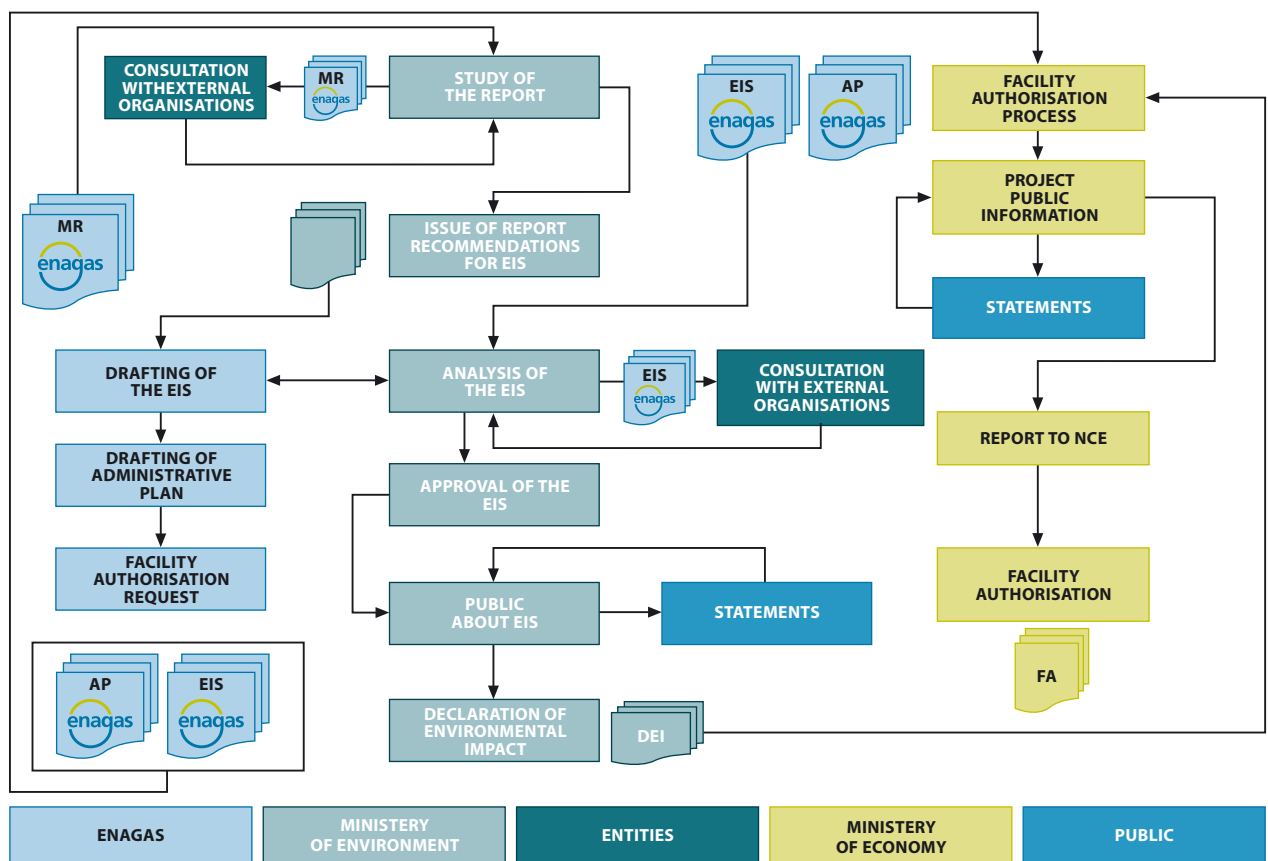
Environmental management in projects

Enagas plans, designs and builds its infrastructures taking environmental conservation into consideration. This requires in-depth knowledge of the impact that may be produced. Once these repercussions have been identified, preventive, minimising and corrective measures can then be defined in the different project phases.

Basic plans and alternatives are studied in the planning phase and the option that presents the least environmental impact is selected.

The environmental impact study is completed with the corrective measures plan that defines specific actions which will be employed to minimise impact during the construction of the project.

Once the general scope of the project is determined, the impact is then studied and corrective measures aimed at mini-



missing environmental repercussions are identified. The impact study is presented to the environmental body and impact evaluation commences for those projects for which applicable legislation establishes this criteria.

Additionally, an environmental monitoring plan is established to ensure compliance of all activities outlined in the corrective measures project.

During the project execution phase, Enagas ensures the protection of the environment through the presence of a technician who monitors environmental issues. This technician is responsible for the proper execution of the preventive and corrective measures, paying special attention to stipulation of the environmental impact declaration. Additionally, he or she maintains pertinent contacts with the Administration, informing it of the most relevant events that occur during the course of the construction work.



Enagas insists that its contractors adhere to the environmental project requirements and also requires them to draft an environmental management plan.

Finally, the Quality and Environment Unit periodically conducts audits in order to guarantee compliance with the environmental requirements applicable to each project.

Once construction is completed and the land is restored to its original state, replanting of the affected natural areas commences. In subsequent years, monitoring is carried out to ensure both the success of the planting that was done and the effectiveness of the corrective measures implemented.

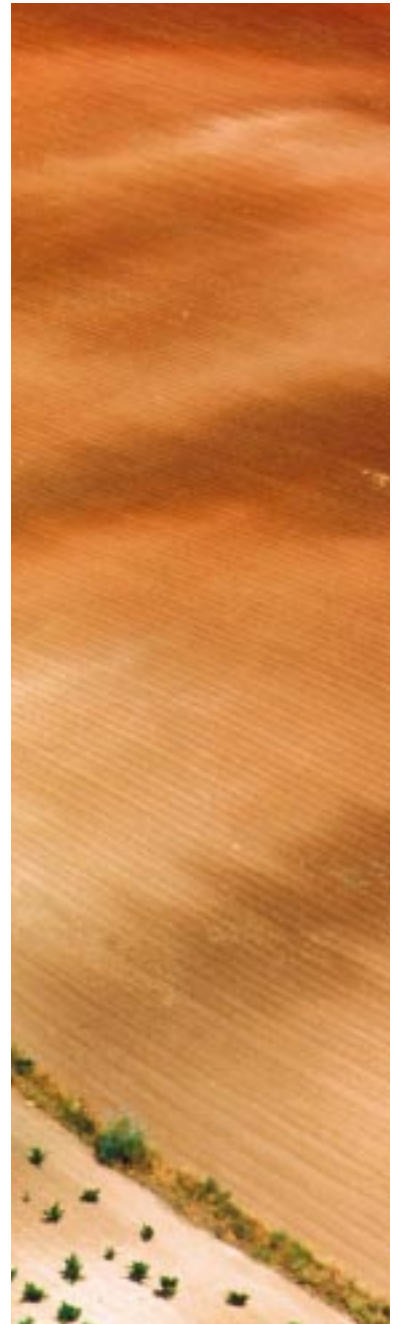


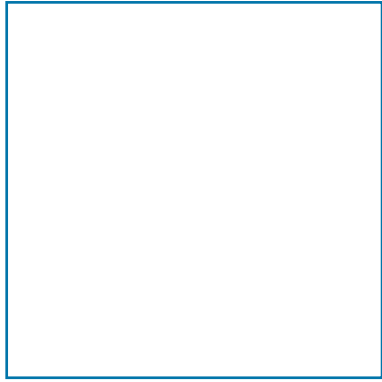
		PK 0,00	TARAYACOMA			PK 10,00
SITUATION	PROY					
	TIPO		LA BARRERA		LA ALBUJAMA	
PIPELINE	UBI	Ø 20"				
	POS	1000				
	PSIA	FLUJO				
HYDROLOGY	CRSO		1 ^a de la Fuente	2 ^a de la Fuente	3 ^a de la Fuente	4 ^a de la Fuente
	REG		Subsuelo	Subsuelo	Subsuelo	Subsuelo
	CRCE		Subsuelo	Subsuelo	Subsuelo	Subsuelo
PROTECTED AREAS	ESPE					
	CRP					
	SLC					
	EXPA					
	BR					
REMAINS	ARQUEOL		Sant Rafael (21 m)	El Talamallo (21 m)		
	PSIA					
RESTRICTIONS	ÉPOCA					





Main Actions and Highlights





↗ Main Actions and Highlights

Main Actions and Highlights

Strategic environmental plan

Each year, a series of actions is performed to comply with the company's environmental objectives.

These goals, a product of the commitment to continuous development in environmental behaviour, are classified as general and specific objectives in the units. This year, the advancements in the general objectives have been the following:

- Reduction in natural gas emissions to the atmosphere at the regasification

plant in Barcelona: detail engineering was developed and equipment was purchased. The project will be executed in 2005.

- Noise reduction in the regulating and measuring stations: the facilities in which it is necessary to reduce noise emissions were selected, and a pilot test of different types of regulation valves was conducted in Cigales to determine the level of noise emission.
- Reduction of the impact on birds around power lines and pipelines: the design of 5 power lines situated near Special Protection Areas for Birds (SPA)

have been evaluated and shortcomings relative to the protection of birdlife were identified; a budget item was added for 2005.

Regarding unit objectives, the following, among others, were achieved:

- Implementation and improvement of waste separation and recycling systems in the Barcelona plant; improvement in the area of maintenance was also recorded in the west, south, east and central areas. The waste involved included scrap metal, paper, cardboard, plastic and toner.
- Installation of leak containment systems in the Barcelona plant and the adaptation of odourisation systems in pipeline positions to prevent spills.
- 17.9% reduction in natural gas consumption due to measures implemented in the basic pipeline network facilities, in the Cartagena and Huelva plants and in the Technology Unit.
- 57 dBA reduction in sound emissions from the supply treatment plant at Serрабо.
- Installation of low-emission NOx systems in 10 gas turbines in the Cordoba, Bañeras, Paterna and Crevillente compression stations.

Training

The training of personnel and efforts to raise awareness among employees are critical to the incorporation of environmental protection into their work activities and are key to the proper operation of the environmental management system.



Main actions and highlights

The following were activities carried out in 2004:

- Course on environmental management in projects aimed at engineering personnel.
- Distribution of an informative leaflet on the environmental management system to all employees.
- Distribution via intranet of a manual on good environmental practices at the workplace.

Additionally, documentation relative to a course geared toward the coordinators of the environmental management system at the work centres has been created, along with informative environmental materials for new hires.

Audits

Audits conducted on the environmental management system and construction activities serve as the main source of information about Enagas' environmental behaviour.

Environmental system management audits evaluate the system's degree of implementation. These audits are either **internal**, carried out by specialised companies, or for the purpose of receiving **certification**, conducted by AENOR.

During this year, both internal and certification audits were conducted in the following facilities and units:

- Regasification plants of Huelva, Cartagena and Barcelona.
- Serrablo underground storage facility.
- Technology Unit.
- 15 maintenance, operation and control centres, 3 compression stations and 4

maintenance centres with compression stations.

Quality and Environment personnel conduct audits corresponding to projects in construction, in order to verify compliance with environmental requirements for projects.

These requirements are found in the corresponding environmental impact declaration, applicable legislation and in commitments adhered to by Enagas in its environmental policy.

A total of 20 audits were conducted in 2004 for the following projects:

- Huelva - Madrid pipelines
- Castelnou - Tamarite de Litera pipeline
- Campo de Gibraltar pipeline
- Cartagena - Lorca pipeline. Phase II
- Compression station in Alicante
- Compression station in Cordoba
- Compression station in Seville
- Compression station in Almendralejo
- Third storage tank in the Cartagena plant
- Emission increase in the Cartagena plant
- Fifth storage tank in the Barcelona plant

Developments in infrastructure projects

Environmental studies

Enagas undertakes studies in which environmental values for projects are considered in order to design a set of measures which guarantee the proper protection of the environment in which its projects are carried out.

In 2004, environmental studies were performed on the following projects:

- Lorca - Almería pipeline



- Alcázar de San Juan - Villarrobledo pipeline
- Villarrobledo - Albacete pipeline
- Albacete - Montesa pipeline
- Undersea pipeline to the Balearic Islands
- Compression station in Navarre
- Compression station in Zaragoza
- Compression station in Denia

Protective Measures

In the construction of its projects, Enagas adopts a series of protective measures to mitigate the impact produced.

These measures seek to achieve the highest level of protection of the affected re-

sources. Among these measures are activities designed to protect soil and vegetation, the marking of roads, the conservation of plant life and the formulation of a fire prevention plan.

Notable among measures enacted for the protection of fauna are visual checks to locate nests or burrows prior to moving machinery, seasonal restrictions for construction works during mating or offspring-rearing seasons, periodic inspections of trenches and the covering of the end of pipelines to ensure that no animals become trapped.

The protection of watercourses is achieved by crossing the bodies in high water

VEGETATION PROTECTION MEASURES

Measures introduced

Use of existing corridors in the execution of works.

Installation of Working restricted areas
New accesses to working areas

Adjustments in layout of pipelines to save plants and trees

Areas affected

Natural Parks of Doñana and Los Alcornocales
Community Important Sites
"Dehesa del Estero and Montes de Moguer", "Cuencas del Rumblar, Guadalén y Guadalmena" y "Cascada de la Cimbarra"

Natural Park of Los Alcornocales
Community Important Sites
"Cuencas del Rumblar, Guadalén and Guadalmena", "Sierra Morena", "Los Monegros", "Serreta Negra" and "Saladares del Guadalentín"

Birds Special protection area
"Areas esteparias del Campo de Montiel", "Las Retuertas and Saladas de Sástago", "Valcuerna, Serreta Negra and Liberola" and "El Basal, Las Menorias and Llanos de Cardiel"

Important Areas of Birds
"Campaña de Carmona", "Campaña alta de Córdoba" and "Aldeaquemada-Dañador"

Natural Park of los Alcornocales
Community Important Sites
"Cuencas del Rumblar, Guadalén and Guadalmena", "Sierra Morena" and "Río Guadajoz"

Rivers
Arroyos Cañetejo, Levante and Salado de Lopera

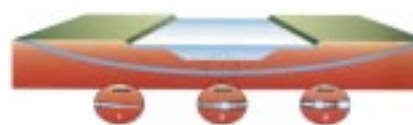
Main actions and highlights

season by means of protective coverings through which water passes, ensuring flow volume and the flux of solid retention systems; excavation material is also used for the restoration of the riverbed.

The river-crossing technique used is done by means of directional drilling which protects the watercourse as well as vegetation flourishing on the bank. The following are a few of the bodies of water crossed this year with this system: the Ebro, Guadaira, Genil, and Almodóvar and Hondo Rivers.

Monitoring Plans

Environmental monitoring seeks to minimise and correct the impact of the project on the environment. Additionally, it enables the identification and quantification of repercussions not originally foreseen, thus facilitating the adoption and implementation of suitable corrective measures.



➤ FAUNA PROTECTION MEASURES

Measures introduced

Temporary restrictions of works to avoid impact over the fauna in critical periods

Protected species include:

- Iberian Lynx, wolf and other
- Iberian Eagle and other birds

Measures to avoid birds accidents with electricity lines

- Special desings of instalations

Areas affected

Naturals Parks of Doñana and de Los Alcornocales "Dehesa del Estero and Montes de Moguer", "Doñaña norte y oeste", "Corredor del río Guadiamar", "Bajo Guadalquivir", "Río Guadajoz", "Cuencas del Rumblar, Guadalén and Guadalmena", "Sierra Morena", "Cascada de la Cimbarra", "Río Cinca and Alcanadre", "Los Monegros" and "Serreta Negra"

Birds Special protection areas "Areas esteparias del Campo de Montiel", "Las Retuertas and Saladas de Sástago", "Valcuerna, Serreta Negra and Liberola" and "El Basal, Las Menorcas and Llanos de Cardiel"

Important Areas of Birds "Campaña de Carmona", "Campaña Alta de Córdoba" "Aldeaquemada-Dañador", "Ballobar-Candasnos" and "Sierras de Cardó, Tivissa and Llabería"

Community Important Sites "Cuencas del Rumblar, Guadalén and Guadalmena"

Birds Special protection areas "Areas esteparias del Campo de Montiel" and "Saladares del Guadalentín"

Important Areas of Birds "Campaña Alta de Córdoba", "Aldeaquemada-Dañador", "Sierras de Cardó, Tivissa and Llabería", "Los Monegros Sur", "Ballobar-Candasnos" and "Sotos de los Ríos Cinca and Alcanadre"

Monitoring is conducted by specialised technicians who work under the project management, and is performed by means of visits to the work areas. Furthermore, regular contact is maintained with the organisations involved in the administration of the project. The results of the monitoring are reflected in corresponding follow-up reports.

In 2004, environmental monitoring entailed an investment of 0.25 million euros in pipelines under construction.

cies found in the zone. These efforts are performed in the autumn following the conclusion of construction; more than 94,472 m² of land were restored in 2004. Landscape restoration entailed an approximate investment of 5.5 million euros this year.

Archaeological Protection

The protection of cultural heritage sites in areas where infrastructures are situated is as important as the conservation of the

RESTORE SURFACE AREA

Community	m ²
Andalusia	8,340,850
Aragon	973,978
Castile-La Mancha	686,400
Murcia	714,300
Total	10,715,528

Landscape Restoration

One of Enagas' foremost objectives in project construction is integration into the surrounding environment, achieved by restoring the affected area.

The corresponding restoration works are divided into two phases: land restoration and revegetation.

The first phase seeks to restore the soil on which corporate structures lie, replacing plant life, watercourses and infrastructures that have been traversed, such as roadways and livestock tracks.

The second phase consists of the revegetation of affected areas using plant spe-



Main actions and highlights

environment. To this end, archaeological studies are conducted in the projects' design phase as well as in site prospecting during project construction, in order to avoid adversely affecting items of cultural heritage.

This year, the investment in archaeological protection amounted to 1.4 million euros.

The most important archaeological finds have been discovered near Seville – Córdoba – Santa Cruz de Mudela near Huelva-- Madrid, of which the following were the most significant:

- *Hazas Cortadas*

The remains of an oven, bedroom structures, tombs of young people and the remains of ceramic articles were found at this site, all from the Islamic period.

- *Cortijo Ruiz Díaz I and II*

The identification of the first of these graves, during the design phase, prompted a modification of the pipeline plan so as to not disrupt the site.

In the subsequent excavation of the grave, silos were found as well as five tombs of adults belonging to the community that had settled in that area.

The following material was recovered in the second site discovered in the area: several structures from the Phoenician period, a water pipe and a washtubasin.

This collection of articles most likely formed part of a domestic structure of a settlement from Roman times.

- *El Altico I and II*

Archaeological prospecting efforts have given way to the unearthing of 10 tombs from different types of burials and what may be a settlement related to tombs from the late Roman period.

Only two of the tombs have remained in good condition. In one of these tombs, hand-made ceramic was recovered as well as remains of a flint file; the stonework of the other tomb has been documented with great precision.

Other Developments

During 2004, Enagas performed other activities designed to protect the environment, among which were the following:

- *Improving the Iberian Imperial Eagle's Habitat in Sites of Community Importance "Cuencas del Rumblar, Guadalén and Guadalmena"*

This project, initiated in 2003, seeks to increase the chance of survival of imperial eagles located in the area, acting against factors affecting the endangerment of the species.

To achieve this goal, habitat protection and improvement measures have been adopted; actions have been taken regarding those factors that encourage the creation and maintenance of a self-suffi-



cient mountain rabbit population, power lines which pose the greatest risk of electrocution to birds have been located and the measures which should be adopted to correct this situation have been identified.

Efforts carried out to fulfil these objectives have consisted in the generation of grasslands, the control of predators, the building of warrens, feeding and drinking troughs and the repopulation of specimens gathered near the project site.

The following actions were completed in 2004: the clearing of 26 hectares of land, the planting of 21 hectares of grain and 20 hectares of grass and leguminous plants, the building of 90 warrens and the release of 984 rabbits.

These activities took place in Chortal and the Palancas.

- *Reduction of the impact on the vegetation in the Parque Natural de los Alcornocales (Los Alcornocales Natural Park)*

The Campo de Gibraltar pipeline partially crosses areas of the Los Alcornocales Natural Park and affects regions populated by plant species emblematic of this space. In order to avoid and minimise this impact, the affected flora specimens have been identified by means of satellite positioning techniques. Works carried out were directed toward the location of trees, bushes and narcissus of the species *viridiflorus*.

This species of narcissus is native to the Cadiz coast and is classified as endangered in the *Libro rojo de la flora silvestre amenazada de Andalucía* due to its limited geographic distribution.



Coinciding with the flowering period of this species and before commencing any projects, 89 specimens distributed in two areas were located, thus enabling the installation of a special work track and the reduction of the number of directly affected specimens to 8.

Several of these specimens were collected and delivered to the botanical garden of the Los Alcornocales Natural Park upon commencing construction work. Upon discovering that the depth at which the bulbs were planted was between 10 and 20 cm, it was decided that roughly 35 cm of earth would be extracted and conserved. In the restoration phase, this stretch of plant life was spread out on the ground, and this area was marked so as to avoid its disruption by machinery.

Additionally, during the replanting of the land used for work activities, trees and bushes which should have been pruned, cut down or transplanted were identified and labelled, under the supervision of park officials.

41 wild olive trees, 3 cork oaks and 4 mastic trees were found.

16 wild olive trees were pruned and 8 were transplanted. All of the transplants have been successful due to the special care taken in their removal and subsequent watering once they had been



Main actions and highlights

transplanted. One mastic tree and 2 cork oaks located on the work grounds were saved.

Environmental figures in Enagas facilities

Emissions to the Atmosphere

Monitoring of atmospheric emissions generated from Company plants is conducted yearly. This monitoring is carried out for two types of emissions: natural gas

The results of the combustion facility monitoring programme have enabled the verification of both the elevated degree of compliance with emission limits established in applicable legislation and the proper operation of these facilities.

CO₂ emissions were 13.6% lower than in 2003, with an average of 945 kg for GWh transported.

For CO and NO_x, average emissions are 164 and 234 grams per GWh of gas transported, respectively.

Sound Emissions

The measuring of noise levels generated by facility operation enables the evaluation of noise impact on the environment and facilitates the adoption of measures to correct this phenomenon.

In 2004, continuing with measuring campaigns enacted in previous years, noise was measured in 27 facilities, and results showed a high level of compliance with applicable legal requirements.

Additionally, efforts have been furthered for the development of a computer programme capable of predicting noise emissions generated by the new regulation and measurement stations once operational.

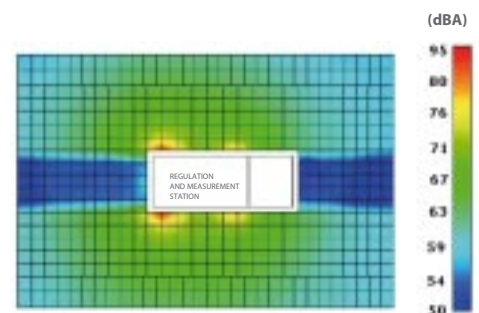
NATURAL GAS EMISSIONS

Areas of activity	Volume m ³ (n)
Regasification plants	21,259,748
Serrablo storage facility	93,350
Basic pipeline network	1,310,182
Total	22,663,280

emissions and those produced at combustion points.

Natural gas emissions correspond to the start-up and stopping of the compression stations, the introduction of gas into new sections of gas pipeline, and, mainly, the operation of the Barcelona regasification plant.

A volume of 22.7 million m³(n) of natural gas was emitted into the atmosphere in 2004, representing 0.085% of the total amount of gas transported. This amount entails an emission of 14,417 tons of methane, involving an average emission of 46.11 kg per GWh of gas transported.



Residual Water Discharges

Enagas centres generate sewage water discharges resulting from lavatories, showers and seawater used in the vaporisation of liquid natural gas in the regasification plants.

These discharges comply with requirements stipulated by applicable legislation; the degree of compliance with discharge conditions is evaluated yearly through the execution of the corresponding monitoring programmes which furnish information about treatment systems.

Analyses were undertaken in 2004 to characterise discharges in 9 centres of the basic pipeline network; additionally, relevant monitoring was carried out in order to comply with the respective discharge requirements for cooling water in regasification plants.

Waste Management

Approximately 2,826 tons of waste were produced in 2004 and delivered to the corresponding authorised managers for treatment or recuperation.

Energy Consumption

An exhaustive monitoring of electrical and natural gas energy consumption is performed each year in the Company's different facilities for the purpose of identifying possible energy saving and efficiency measures that enable a more moderate use of energy resources.

Energy consumed throughout the facilities in 2004 rose to 1.542 GWh, a 14.1% decrease with respect to data recorded for 2003. This consumption represents 0.48% of the total gas trans-



EMISSIONS FROM COMBUSTION POINTS

Areas of activity	CO ₂ (t)	CO (t)	NO _x (t)
Regasification plants	50,165	21	12
Serrablo storage facility	44,850	6	5
Basic pipeline network	206,875	26	58
Total	301,890	52	75

HAZARDOUS WASTES MANAGED

Type	Amount (t)
Spent lights	2.6
Used batteries	7.8
Alkaline, saline and button batteries	2.8
Used oils	22.3
Empty chemical containers	6.1
Contaminated rags and absorbents	6.9
Methanol water	2,480.8
Oily water	50.6
Other wastes	16.7
Total	2,596.6

RECOVERED WASTE

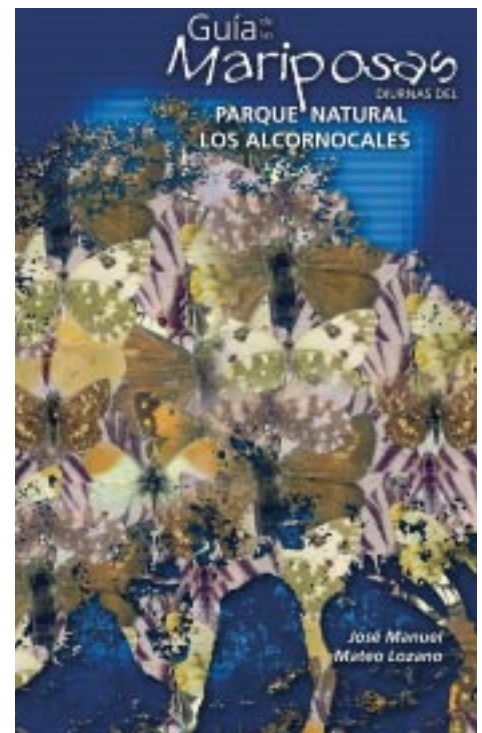
Type	Amount (t)
Paper and cardboard	77.1
Scrap metal	148.8
Plastics	2.0
Wood	2.3
Total	230.2

Main actions and highlights



Other developments of interest

This publication, fruit of the commitment to collaborate with different public administrations, seeks to educate the visitors to this important natural space on the most significant and representative species of this group of insects in the natural park, a symbol of the conservation of the Mediterranean forest in the Iberian Peninsula. The guide contains an atlas of approximately 100 species present in the park and includes a collection of descriptive cards and images of these species.



ENERGY CONSUMED

Areas of activity	Amount (GWh)
Regasification plants	379
Serrablo storage facility	121
Basic pipeline network	1,042
Total	1,542

ported, compared to 0.65% the previous year.

This marked improvement in energy consumption and efficiency is the result of improvement measures enacted in 2004 and the more efficient use of regasification facilities and transport.

Natural gas represents nearly 86% of the total amount of energy consumed, while the remaining percentage corresponds to electrical energy.



Environmental investments and expenditure

Environmental activities carried out by Enagás in 2004 entailed investments and an expenditure that amounted to 14.1 million euros, of which investments allotted to revegetation for landscape restoration and directional drillings were notable.



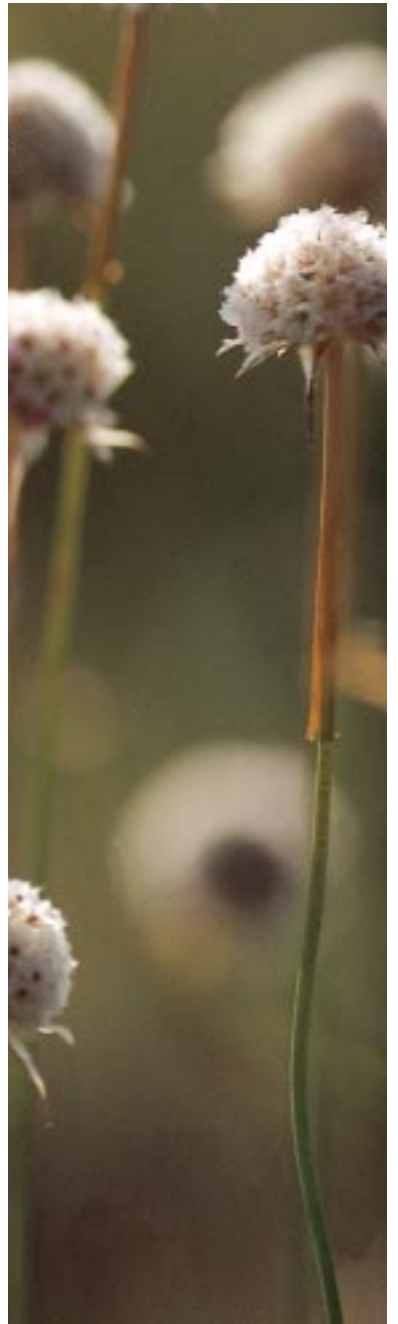
➤ SUMMARY OF EXPENDITURE IN INVESTMENTS

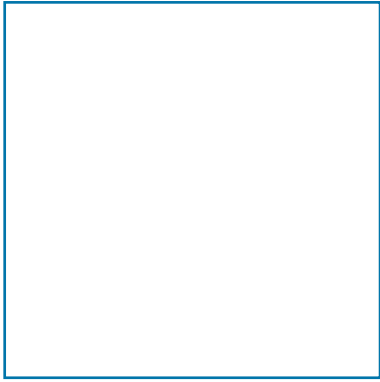
Activity	Amount (€ million)
Development, implementation monitoring the environmental management system	0.201
Monitoring campaign and control of noise, emissions and discharges	0.073
Waste management	0.600
Environmental monitoring in constructions activities	0.247
Landscape restoration	5.482
Directional and horizontal drillings	5.526
Archaeological protection and recovery	1.397
Other environmental improvements	0.593
Total	14.119





Glossary
of Terms





↗ Glossary of Terms

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

Important Bird Area (IBA): list of important areas for the bird species that figure in Appendix I of Directive 79/409/EEC. In Spain, the list has been compiled by Sociedad Española de Ornitología (Spanish Ornithology Society - SEO).

Environmental audit: systematic, documented verification process to determine if an organisation's environmental management system corresponds to the refer-

ence 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.



Environmental behaviour: measurable results of the environmental management system.

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 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.

Emission right: entitlement to emit one ton of carbon dioxide during a specific period.

Sulphur Dioxide (SO₂): gas produced in the combustion of fossil fuels with a high content of sulphur (carbon, fuel oil, coke etc.). It is one of the pollutants responsible for acid rain.

Carbon dioxide (CO₂): colourless and odourless gas, heavier than air, which is generated in the fossil fuel combustion processes, in animals' respiration, in the decomposition of organic material, etc. It is the principal cause of the greenhouse affect.

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 must be able to utilise and transform them into useful energy. This concept includes

hydroelectric, wind, solar, biomass, tidal, geothermal and wave energy.

Natural Gas: a mixture of gases from a fossil origin, primarily composed of light hydrocarbons whose principal component is methane (CH₄).

Liquid Natural Gas (LNG): natural gas in liquid phase. At atmospheric 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 hexafluoride, perfluorocarbons and hydrofluorocarbons.

Halocarbons: non-toxic halogenated hydrocarbons that contribute to the greenhouse effect and the destruction of the ozone layer.

Energy intensity: ratio of energy consumption to Gross Domestic Product (GDP).

m³(n): the volume of gas contained in a cube with a side of 1 m, at 1 atmosphere of pressure and at a temperature of 0°C.

Site of Community Importance (SCI): areas which feature the natural 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 14001:2004 Standard: international standard for environmental management systems modified in 2004. It is the reference standard for the Enagas system.

Environmental objective: environmental target of a general nature, which originates in an organisation's individual envi-



ronmental 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.

Global warming potential: amount of carbon dioxide that would have to be emitted to the atmosphere to produce the same effect as the emission of one unit of given gas, in a determined period of time.

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

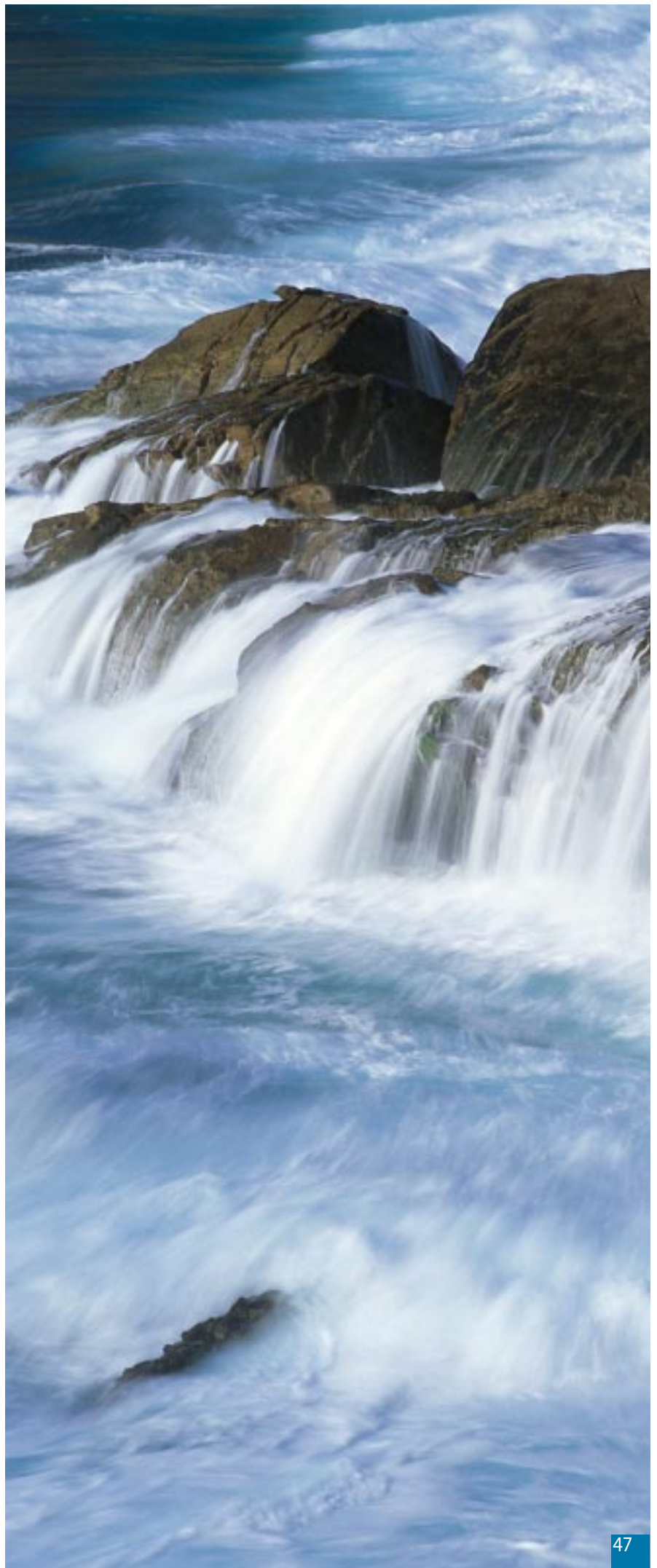
Hazardous waste: those materials which have been classified as such by relevant legislation.

Environmental Management System (EMS): 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.

Carbon dioxide equivalent ton (t CO₂ equivalent): a metric ton of carbon dioxide or an amount of any other greenhouse effect with an equivalent global warming potential.

Ton of oil equivalent (toe): unit of energy equal to 11.63 MWh.

Special protection area for birds (SPA): territories designed to ensure the survival of the species listed in Appendix I of Directive 79/409.



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