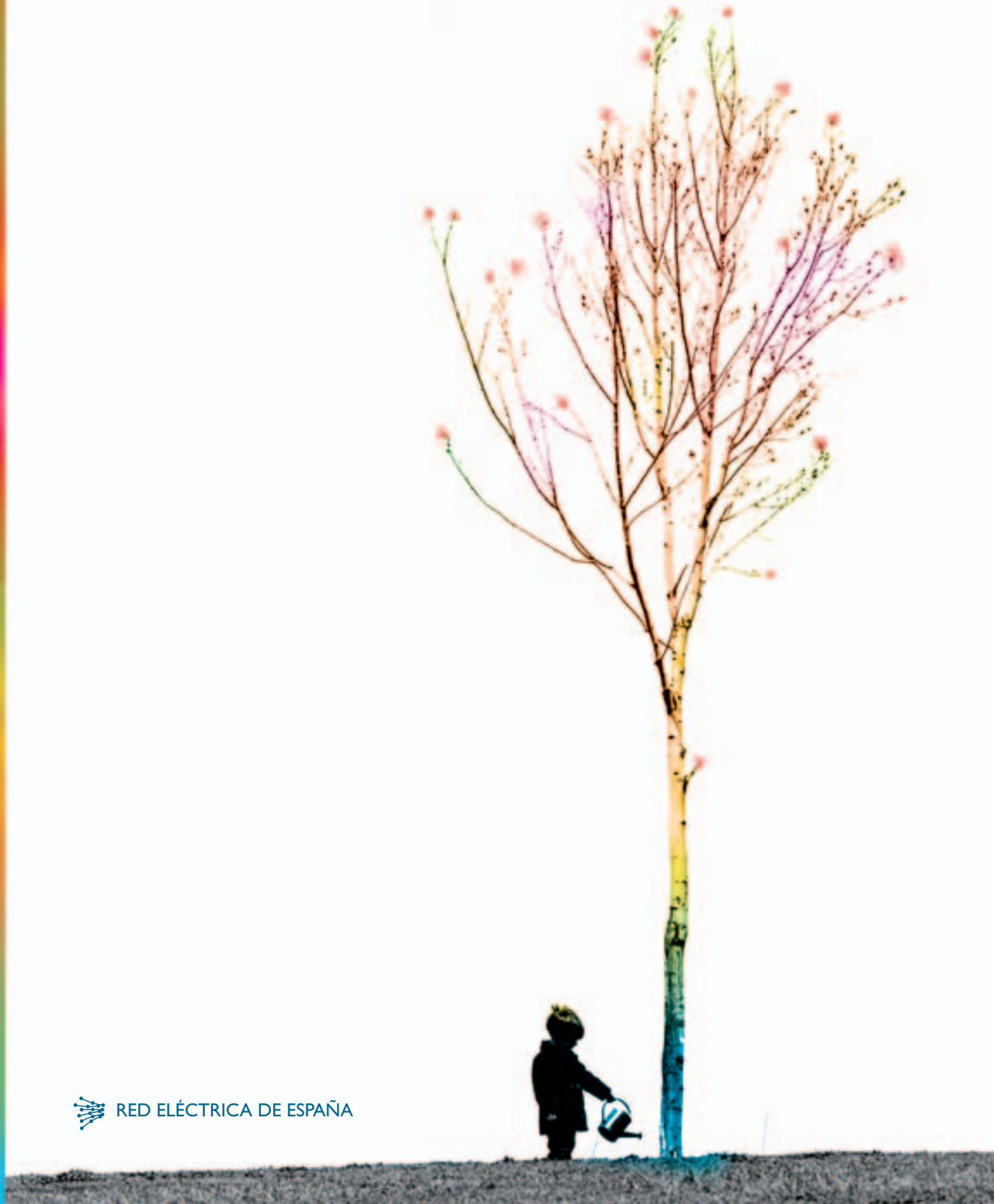
Environment Report ´03



RED ELÉCTRICA DE ESPAÑA

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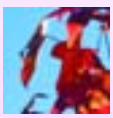
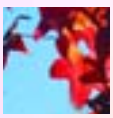
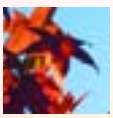




Introduction

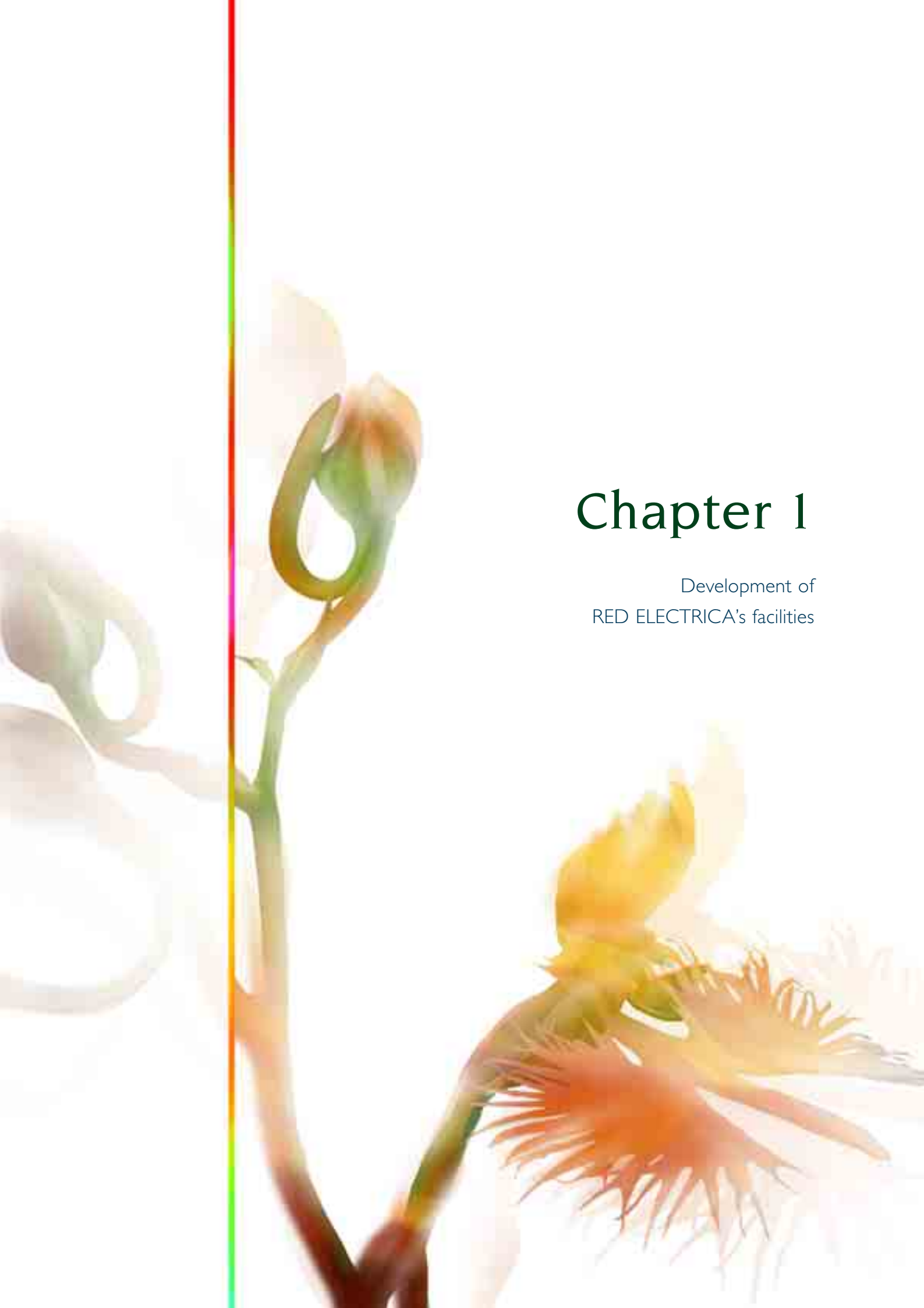
For the fifth year running I am pleased to present Red Eléctrica de España's environmental report. We hope this will –in some measure– answer questions on our activities in the area of environmental management. As in years past, we will attempt to highlight our concern for the environment in the form of a document that explains the year's activities, our policies, the results that reflect our environmental efficiency and the main goals for 2004. This document will demonstrate our commitment to continuous improvement and maintenance of the environment in which we conduct our activities.

As evidence of our endeavours to improve the quality of reporting, Red Eléctrica obtained the 2002 prize for the best environment and sustainability report among Spanish companies. This was awarded by the Spanish Institute of Auditors and the Spanish Accounting and Business Administration Association for the high quality of the report's content and the criteria used in its preparation. This reaffirms our desire to inform our shareholders, customers, suppliers and employees in a clear and transparent manner.

As usual, at the beginning of October, Red Eléctrica organised the 4th conference on Power Lines and the Environment. This was attended by companies from the electricity sector, government authorities, national and international experts, public and private organisations, associations, etc. The aim was to share knowledge and experience, and to discuss and reflect on environmental issues related to the transmission and distribution of electricity and its contribution to sustainable development.

Finally, I can only express my gratitude for the excellent response from our staff, suppliers and partner firms, without which we could not have achieved the ambitious targets we had set in regard to protection of the environment.

Victoriano Casajús Díaz
General Manager of RED ELÉCTRICA DE ESPAÑA



Chapter 1

Development of
RED ELECTRICA's facilities

RED ELÉCTRICA is a leading electricity transmission company. It is responsible for operation of the Spanish electricity system and management of transmission grid.

It operates the Spanish mainland electricity system, ensuring the appropriate technical conditions so that electricity flows smoothly from power stations to the centres of consumption through the grid (which extends all over the mainland).

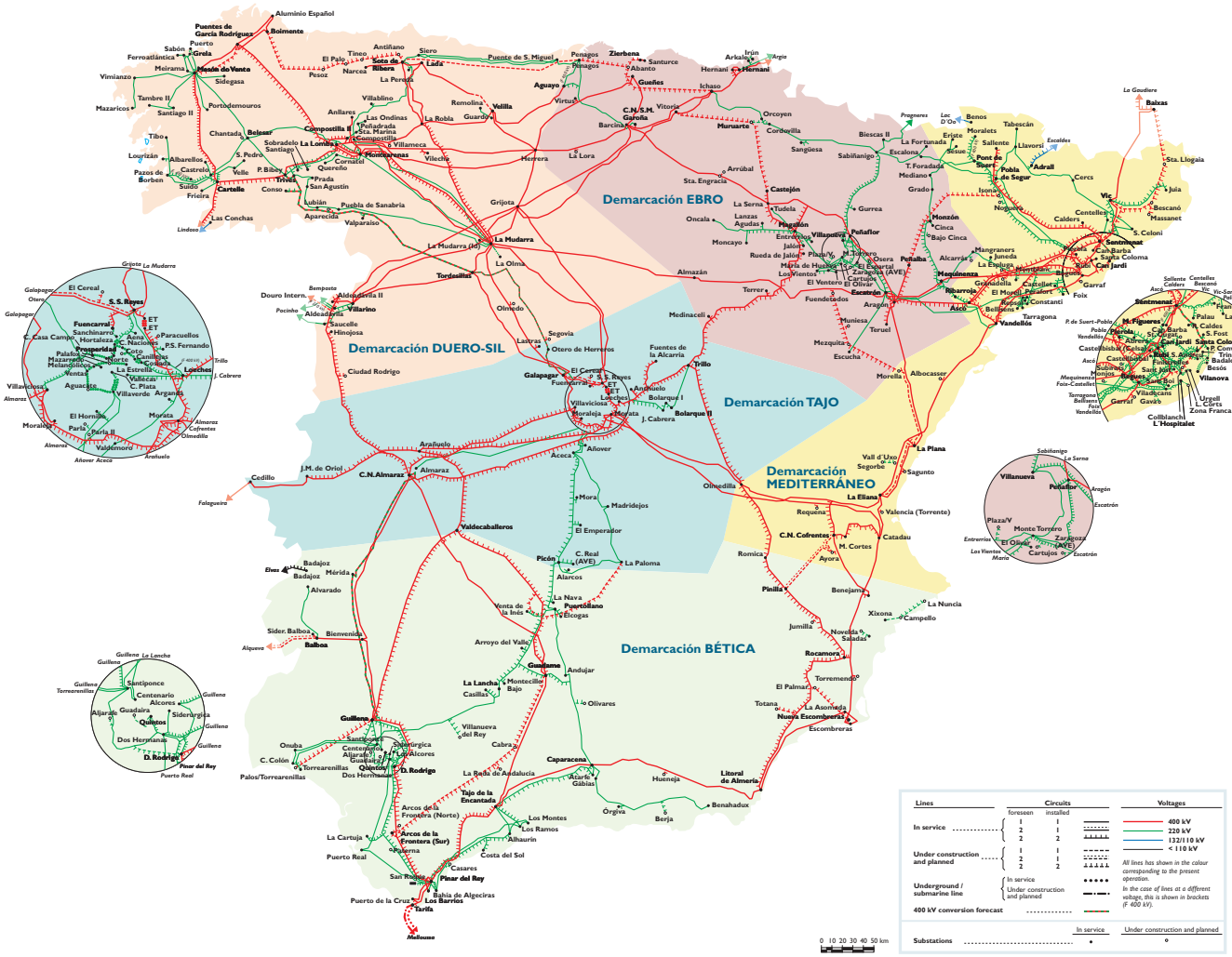
RED ELÉCTRICA owns most of the Spanish high-voltage transmission network. Its facilities comprise the electricity control systems that handle and monitor operation of the system. There are 27,538 km of high-voltage circuits, 1799 circuit ends at substations and 31,616 MVA of total transformer capacity.

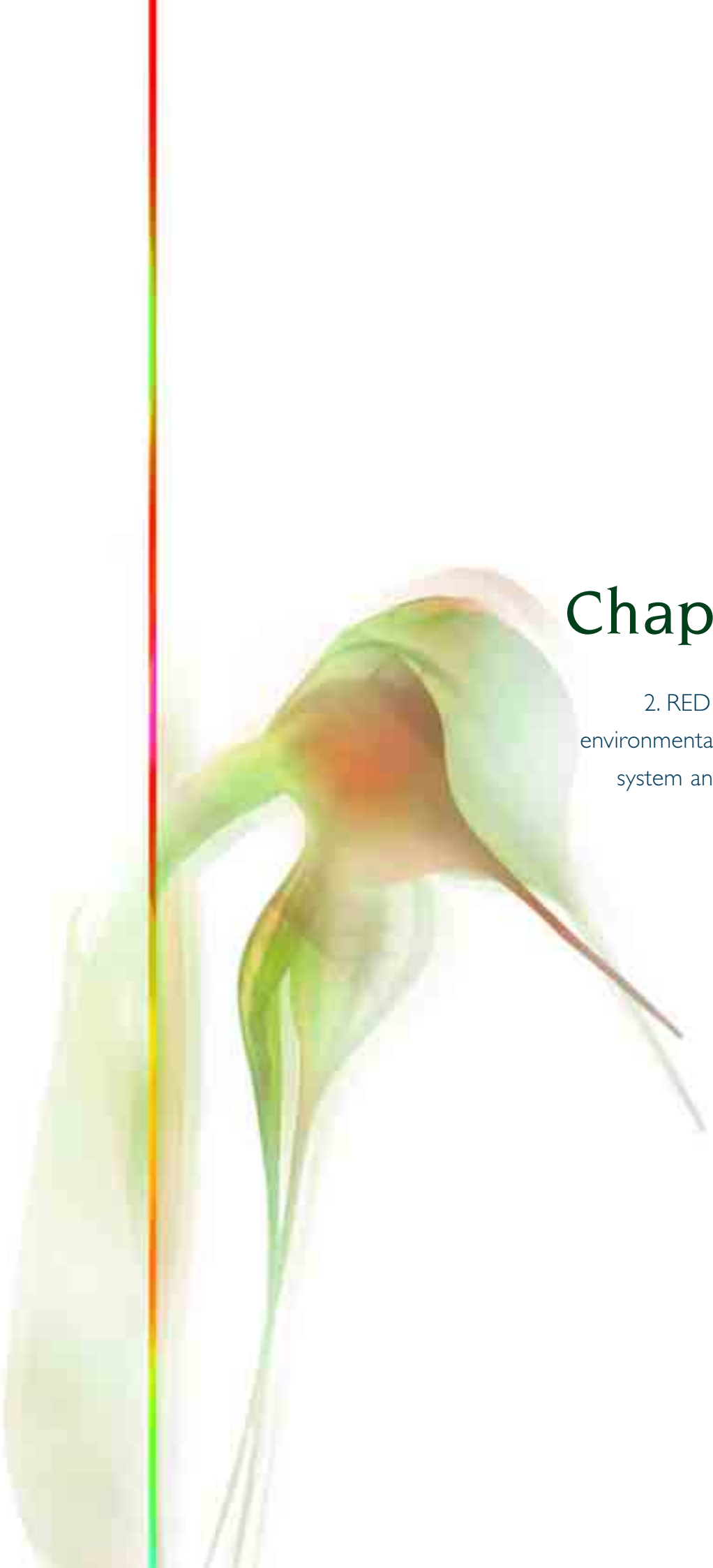
All RED ELÉCTRICA's activities are conducted in accordance with a strict environment policy and with an ethical commitment to society. It integrates environmental protection with its business management to create value in a persistent manner.

Growth of RED ELÉCTRICA's transmission facilites

			2001	2002	2003
Power lines *(km of circuit)*		400 kV	14.838	15.745	16.270
		220 kV and less	4.402	11.260	11.268
		Total	**19.240**	**27.005**	**27.538**
Substations	Circuit ends	400 kV	521	639	684
		220 kV and less	196	1.091	1.115
		Total	**717**	**1.730**	**1.799**
	Transformer capacity	Total power (MVA)	20.276	26.966	31.616

Transmission grid divided into the Operation and Maintenance Centres





Chapter 2

2. RED ELECTRICA's environmental management system and organisation

RED ELÉCTRICA has a commitment to protect the environment environment that stems from its environment policy.

For this purpose it has an environment management system that was certified in May 1999 under the UNE-EN ISO 14001 standard. This has been registered with the EU Environmental Management and Auditing System (EMAS) since October 2001.

Red Eléctrica also has an environment department with 19 staff who are trained in the different areas concerned. The department provides technical support to any company unit. However, environmental activity is not the exclusive preserve of the environment department. All employees must carry out their work with maximum respect for the environment. They contribute to preservation of habitats, proper waste management and to minimising consumption at work. There is an internal code that defines the corresponding duties.

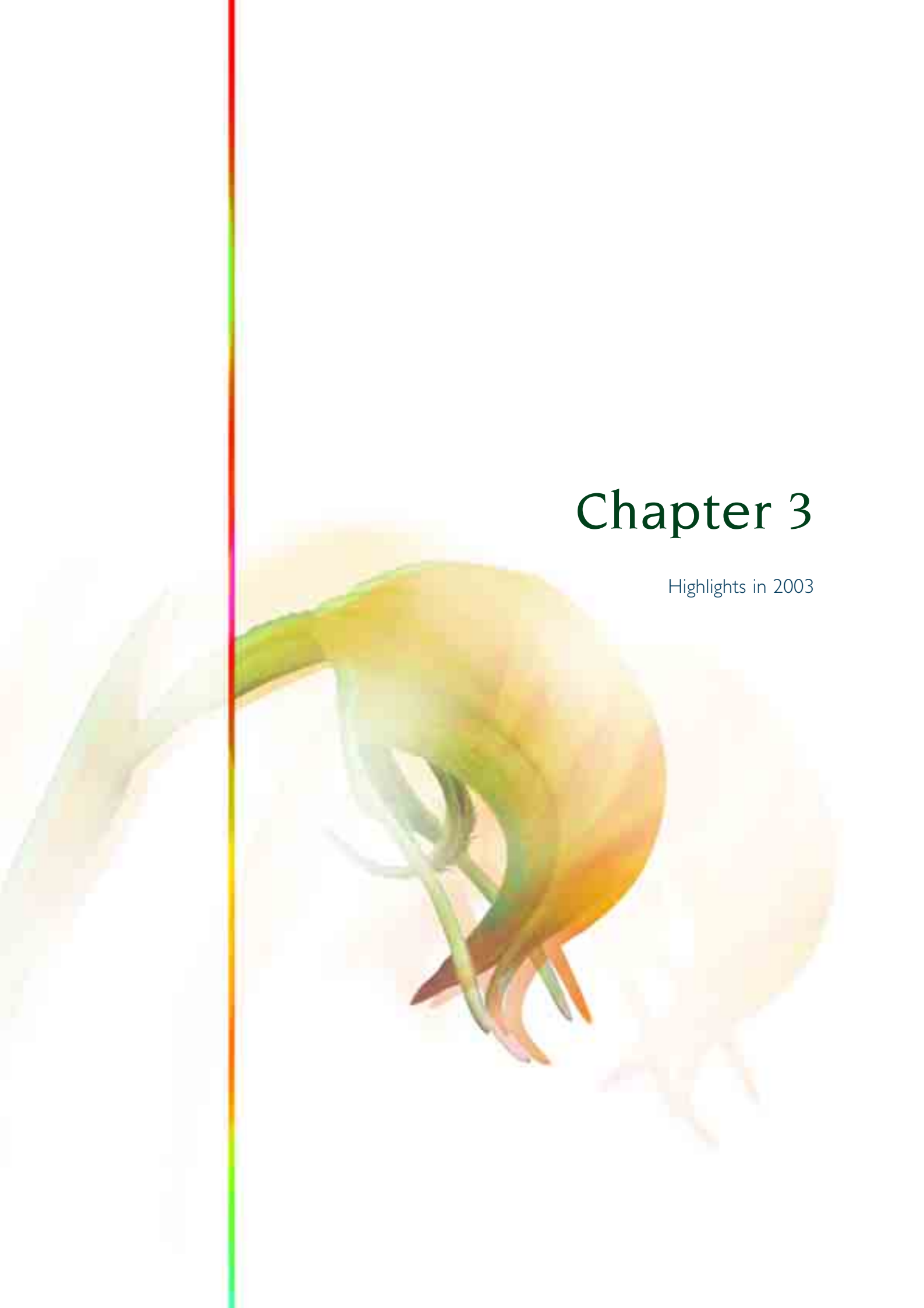
The distribution of the main activities by department, as defined by the system, is shown below:

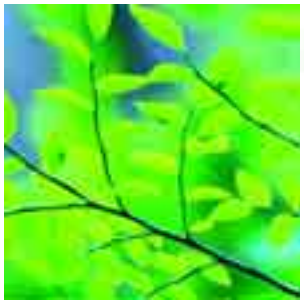
Structure


Chairman's Office
Approval of the environment policy and monitor its application
Legal Department
Support on environmental issues
Communications & Institutional Relations Department
External communication
Technical Secretary
Audits
Documentation
Corporate Accounting and Finance Department
Control of environmental costs
Consumption
Suppliers
Corporate Human Resources Department
Training
Internal communications
Emergency plans
General Manager's Office
System checking
Aspect identificaton and evaluation
Definition of goals and targets
Engineering and Construction Department
Environmental aspects
• Environmental Impact Studies
• Vegetation
• Birdlife
• Landscape
• Electromagnetic fields
• Waste management
Facility Maintenance Department
Environmental aspects
• Vegetation
• Birdlife
• Landscape
• Electromagnetic fields
• Waste management
• Consumption
Technology and Environment Department
Co-ordination of the system
Operations Department
Environmental aspects
• Waste management
• Consumption
Grid Development
Environmental aspects
• Environmental Impact Studies
Territorial Co-ordination Department
Environmental aspects
• External communications

Chapter 3

Highlights in 2003





Milestones in 2003 include the following:

- The **prize for the best environment and sustainability information among Spanish companies.** This was awarded under the best environmental report category by the Spanish Institute of Auditors and the Spanish Accounting and Business Administration Association for the high quality of its content and the criteria used in its preparation.

- **Conference on Power Lines and the Environment** held at the beginning of October. This was attended by companies from the electricity sector, government authorities, national and international experts, public and private organisations, associations, etc. The aim was to share knowledge and experience, to discuss and reflect on environmental issues related to the transmission and distribution of electricity and their role in the challenge posed by sustainable development.

- An agreement with the Ministry of the Environment (the public watchdog on environmental issues) to subject Red Eléctrica's new substation projects to environmental assessment, at our request and from 2003 onwards. This is done to determine whether or not it is necessary to submit the substation in question to the official environmental impact assessment procedure.

- A **positive environmental impact declaration** for three power lines (the Muruarte-Castejón line, the new Escombreras-Murcia Main Supply-Rocamora line and the Palos-Guillena line) and for two substations (Muruarte y Morella). The environmental impact declaration for two more lines and two more substations is pending.

- **Environmental assessment** was obtained for four substations (Fuendetodos, Olmedo, Santa Engracia and Segovia) and approval for four more has been requested.

Chapter 4

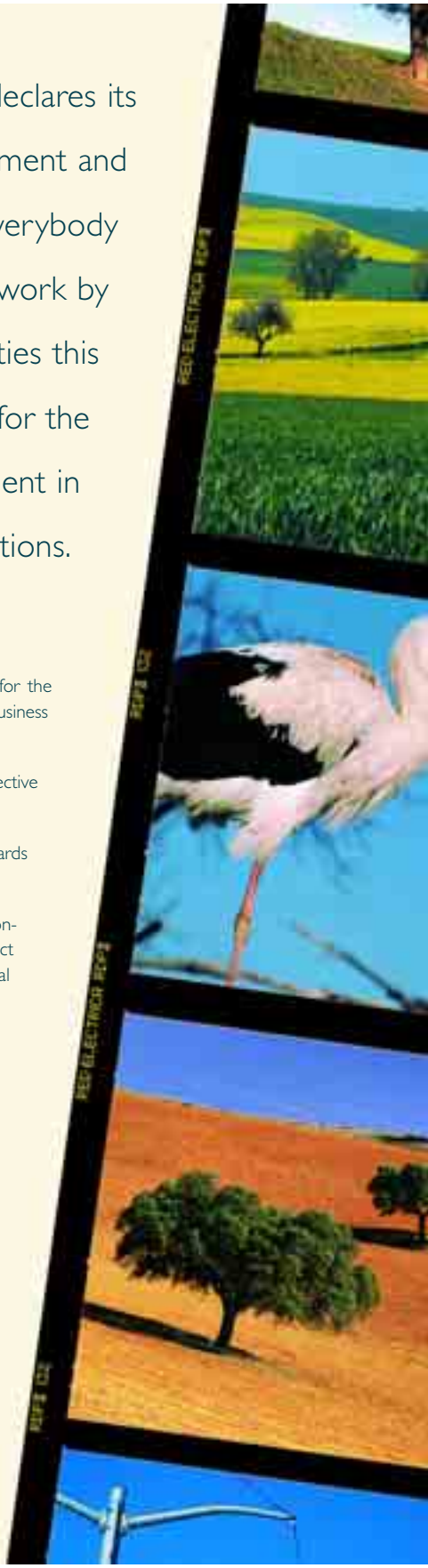
Environmental policy

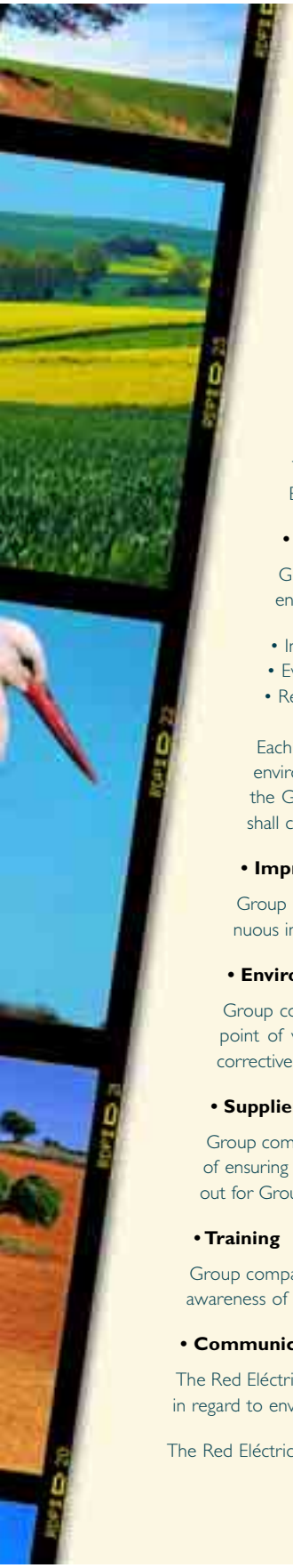
Through its environmental policy, the RED ELÉCTRICA Group declares its commitment to protect the environment. It encourages everyone in the group to carry out his or her work with maximum respect for the natural environment and to display a responsible commitment to society.

The **RED ELÉCTRICA GROUP** declares its commitment to protection of the environment and it undertakes to facilitate and encourage everybody in the Group to carry out his or her work by reconciling the requirements of the activities this entails with maximum respect for the environment through continuous improvement in compliance with her or his duties and functions.

Principles

- To guide the Group towards sustainable development, combining respect for the environment and the encouragement of progress and social welfare with business aspects and with the goal of creating value in a persistent manner.
- To foster environmental leadership of the Group's companies in their respective fields of activity.
- To ensure compliance with environmental legislation, regulations and standards that apply to Group companies.
- To ensure that the activities carried out by the Group consider the environmental consequences, preventing or minimising possible environmental impact by evaluating and monitoring compliance with the Group's environmental policy and with the environmental management systems.
- To establish goals and objectives in regard to environmental protection that are in accordance with the commitment to continuous improvement.
- To be aware and to apply the latest scientific and technical developments related to environmental protection in the group's areas of operation.
- To carry out environmental studies for all the Group's new installation projects.
- To ensure that suppliers comply with environmental requirements specified by Group companies.
- To set up permanent training systems for Group employees covering awareness and motivation in respect of environmental protection.
- To develop channels and systems of communications which will provide information and dialogue between the interested parties regarding Group action on environmental issues.





Guidelines

• The environment management system

Wherever it considers it necessary to demonstrate a serious commitment to the environment in connection with its activities, the Red Eléctrica Group must obtain certificates for its environmental management systems.

The Red Eléctrica Group shall encourage the design of environment management systems based on the UNE-EN-ISO 14001 standard.

The Red Eléctrica Group progressively aligns its environmental management systems with the EU Environmental Management and Auditing System (EMAS).

• Evaluation and monitoring

Group companies are equipped with tools to evaluate and monitor compliance with the Group's environmental policy and environmental management systems. The main items include the following:

- Internal audits
- Evaluation of environmental aspects
- Reviews of the environmental management systems

Each company's management must check the adequacy of the Group's environmental policy and its environment management system with the Group/company strategy by evaluating compliance with the Group's environmental policy and with its environmental management systems. Following this it shall consider the necessary modifications or improvements.

• Improvement

Group companies shall be equipped with tools to establish and check the goals and targets of continuous improvement with regard to protection of the environment.

• Environmental Studies

Group companies shall analyse in advance the impact which new installation projects will have from the point of view of the ecological, social and economic environment. They shall establish preventive and corrective measures as necessary to prevent or minimise these by means of the corresponding studies.

• Suppliers

Group companies shall have a methodology available to evaluate, qualify and monitor suppliers with the aim of ensuring environmental protection in those activities that affect the environment and which are carried out for Group companies.

• Training

Group companies shall have tools available to set up training activities, to motivate and constantly focus the awareness of its personnel on environmental protection.

• Communication

The Red Eléctrica Group shall develop channels and systems of communication to report the Group's activities in regard to environmental matters.

The Red Eléctrica Group shall set up channels for constant dialogue with interested parties.

Chapter 5

Environmental programme.
Goals and targets

Overall compliance with the 2003 environmental programme was 72.2%.

Overall compliance with the 2003 environmental programme was 72.2%. The table below summarises the goals and targets set for 2003 and the degree of attainment.

A 0% degree of compliance may indicate that these targets were not met in 2003 and will become part of the environmental programme for 2004 as having been carried out in 2003 but outside the time set.

Environmental targets and goals in 2003

Areas	Goals	Targets	Target Achieved	Target Weighting	% Goal met	Goal Weighting
Improvement in environmental management	Improvement of the environment management system	Improvement in environment management processes	(1)0 %	50 %	50 %	8
		Integration and improvement of environmental standards	100 %	50 %		
	Improvement in processes	Procedure for control of SF6 emissions	(2)0 %	70 %	30 %	8
		Specifications for the preparation of environmental impact studies in html	100 %	30 %		
Protection of birdlife	Reduction of danger to protected birdlife	Agreement with the Doñana Biological Station (CSIC) for preservation of the common kestrel	100 %	25 %	100 %	8
		Agreement with the Agriculture, Water and Environment Council in the Murcia region on marking of power lines	100 %	25 %		
		Agreement with the Agriculture And Environment Council in the Extremadura region on marking power lines	100 %	35 %		
		Tracking the collision study on the Guadame-Tajo line	100 %	15 %		
Protection of the landscape	Analysis and reduction of the visual impact of installations	Graphic simulations for seven substations and one power line	(3)50 %	30 %	15 %	12
		Landscape improvements for nine substations	(4)0 %	70 %		
Prevention of contamination	Incorporation of new assets in SIGMA	Environmental inventory and proposed preventive and corrective measures for all facilities incorporated in telecontrol	100 %	100 %	100 %	12
	A reduction in the risk of accidental spillage of oil from transformers and reactors and of fuel from generator sets	Loss of water from three oil collection pits at one substation	(2)0 %	20 %	80 %	8
		Analysis and proposal for preventing the loss of water from three collection pits	100 %	30 %		
		Overhaul and checking of fuel leaks from generator sets at five substations (5)	100 %	35 %		
		Analysis of possible solution and proposal to prevent leaks from fuel tanks in one region (6)	100 %	15 %		
Reduction of consumption	Reduction of consumption of electricity and water (7)	Analysis of electricity consumption at head office and at control centre 2.	100 %	100 %	100 %	4
Control of suppliers	Training and environmental qualification of suppliers	Supplier training	100 %	50 %	50 %	8
		Revision and improvement of the supplier environmental qualification system	(2)0 %	50 %		
Training	Training of personnel on environmental matters	Preparation of medium-term training plan	(1)0 %	30 %	70 %	6
		Course on treatment of right-of-ways, trimming and pruning	100 %	30 %		
		Course on environmental aspects of construction and waste handling	100 %	40 %		
Communication	Improvements to communications	2002 environment report	100 %	20 %	100 %	12
		2002 sustainability report	100 %	30 %		
		4th Conference on Power Lines and the Environment.	100 %	25 %		
		Agreement with the College of Physicists for the design of a web site	100 %	25 %		
Design and construction	Design and construction of power lines and substations	Environmental impact declarations for three power lines	100 %	50 %	100 %	12
		Positive environmental assessment from the Minisrty of the Environment for eight substations	100 %	50 %		
		Total			72,2 %	

(1) Target achieved after time set
(2) Target which ends in 2004.
(3) Five substations and one line finished.
(4) Improvements 100% completed at 3 substations and 50% completed at 2 others.
(5) Overhaul and control of fuel leaks was carried out at one substation more than planned.
(6) Apart from the analysis and proposal of solutions, in 2003 the proposed items were carried out.
(7) As result of the analysis of comsumptions is decided to eliminate the goal covering a number of years. This goal is considered fulfilled because the annual target has concluded.

Lastly, a table is shown below with a summary of the environmental goals and targets planned for 2004.

Environmental targets and goals in 2004

Areas	Goals	Targets
Improvement in environmental management	Improvement of the environment management system	Improvement in the facility construction process
		Integration and improvement of environmental standards
Protection of birdlife	Reduction of effect on birdlife	Launch of a R&D&I project on the effectiveness and useful life of the birdsaver devices
Protection of the landscape	Reduction of the visual impact of installations	Landscape improvements at two substations
Prevention of contamination	Incorporation of new assets in SIGMA	Environmental inventory and proposed preventive and corrective measures for all remaining 2003 facilities
		Research on possible environmental liabilities
		Construction of pits for power machines lacking these items
	Reduction in the risk of accidental spillage	Overhaul three collection pits at one substation
		Overhaul and check leakage for three fuel tanks at one substation
		Inventory of 50% of the expansion tanks on machines and proposed preventive measures
		Inventory of 30% of auxiliary transformers and proposal of preventive measures
		Review of preventive measures and procedures for spillage
	Prevention of contamination	Procedure for control of SF6 emissions
		Measurement plan for electromagnetic fields and noise
		Review of management of waste generated by maintenance and proposals for improvement
Control of suppliers	Environmental qualification of suppliers	Revision and improvement of the supplier environmental qualification system
Training	Training of personnel on environmental matters	Carry out courses in the 2004 training plan
Communication	Improvements to communications	Prepare a web site with the Official College of Physicists
		Publication of the book on the 4th Conference on Power Lines and the Environment.
		Publication of the bi-monthly Environment Bulletin.

Chapter 6

Environmental aspects

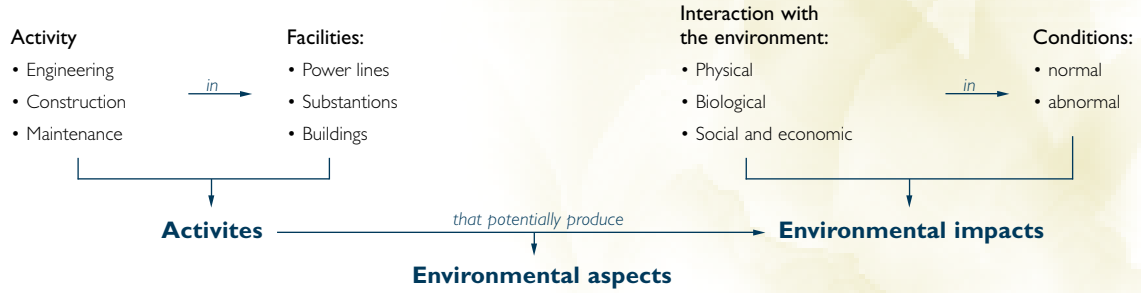
RED ELÉCTRICA identifies all those environmental aspects

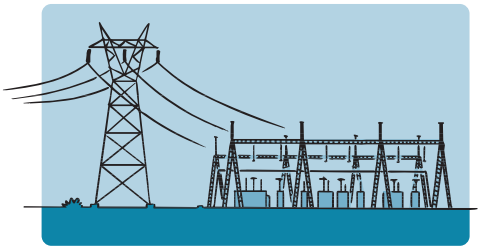
of engineering, construction and maintenance activities at the different facilities (power lines, substations and buildings) that might interact with the environment and produce some sort of negative impact. This process considers normal conditions as well as abnormal conditions of operation.

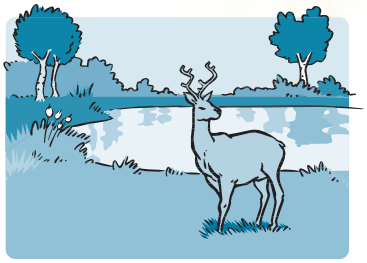
In order to establish the importance of this interaction with the environment and act in the most environment-friendly manner possible, RED ELÉCTRICA's identifies and evaluates the environmental aspects using various methods. The method for engineering and construction aspects is different to the one used for maintenance aspects.

Once the aspects are identified and evaluated, those found to be significant are analysed. This leads to a definition of preventive and corrective measures as well as the appropriate environmental goals and targets.

Identification of environmental aspects





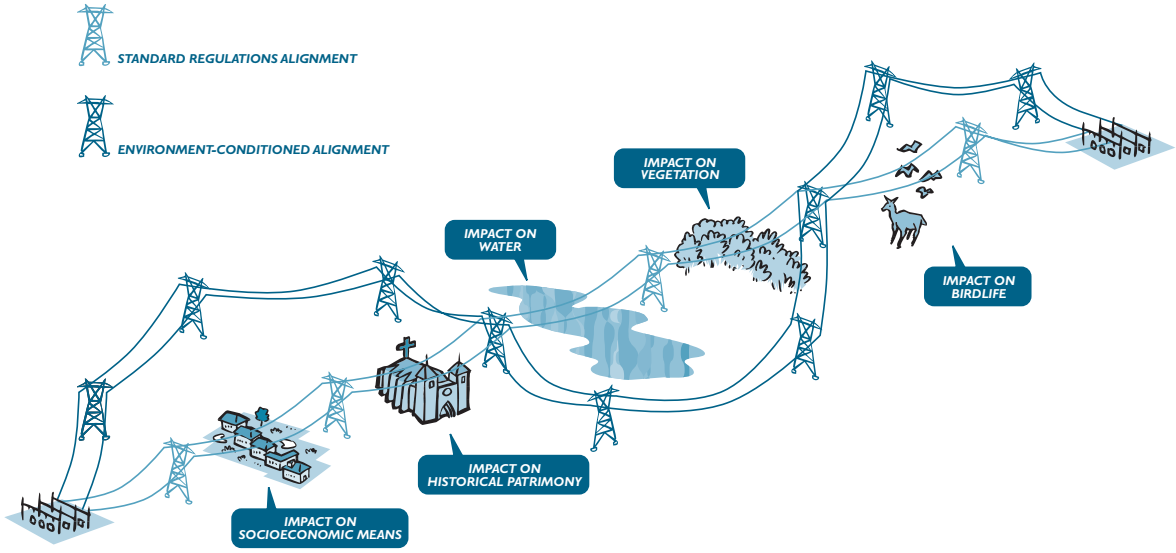


6.1 Aspects related to engineering and construction

The identification and assessment of environmental aspects of engineering and construction activities is carried out separately for each project in each environmental impact study and for each environmental monitoring programme and/or environmental specification.

RED ELÉCTRICA conducts environmental impact studies for all power lines and substations that it promotes or builds regardless of whether they are subject to environmental impact assessment in accordance with the Environmental Impact Assessment Act (Law 6 of May 8th 2001). The schedules in the act list the types of installation subject to this procedure. They do not include electrical substations.

The main goal of an environmental impact study is to find the alignment or location

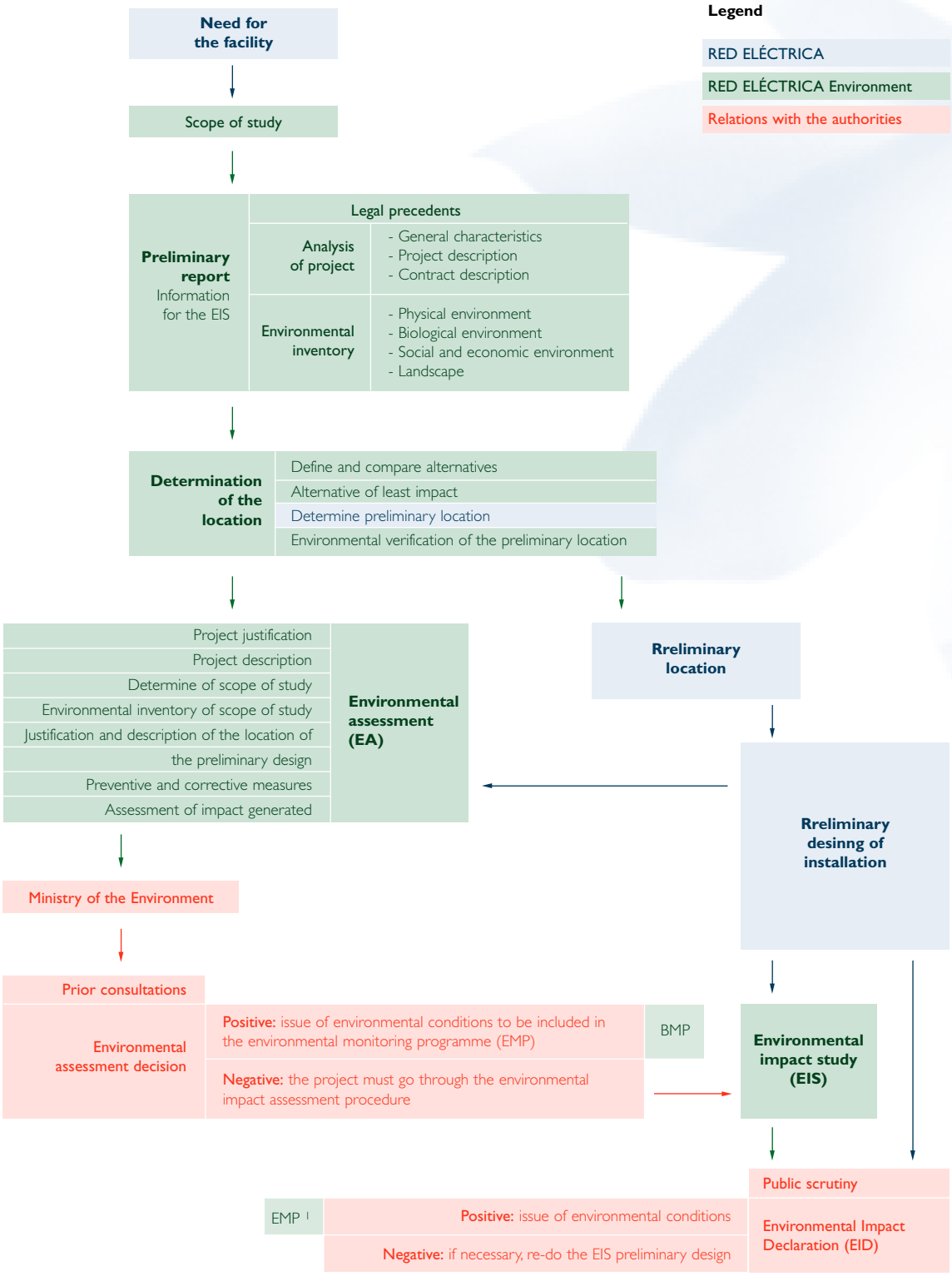


that will have the smallest impact on the natural and social environment – and still be technically and economically viable.

It should be noted that, from 2003 onwards and at Red Eléctrica's request, the Ministry of the Environment (the public watchdog on environmental issues) subjects our new substation projects to an environmental assessment procedure. This is done to determine whether or not it is necessary to submit the substation in question to the official environmental impact assessment procedure. The environmental assessment of substations consists of an analysis of the environmental study for the substation, which is a summary of the environment impact study that is carried out in all cases.

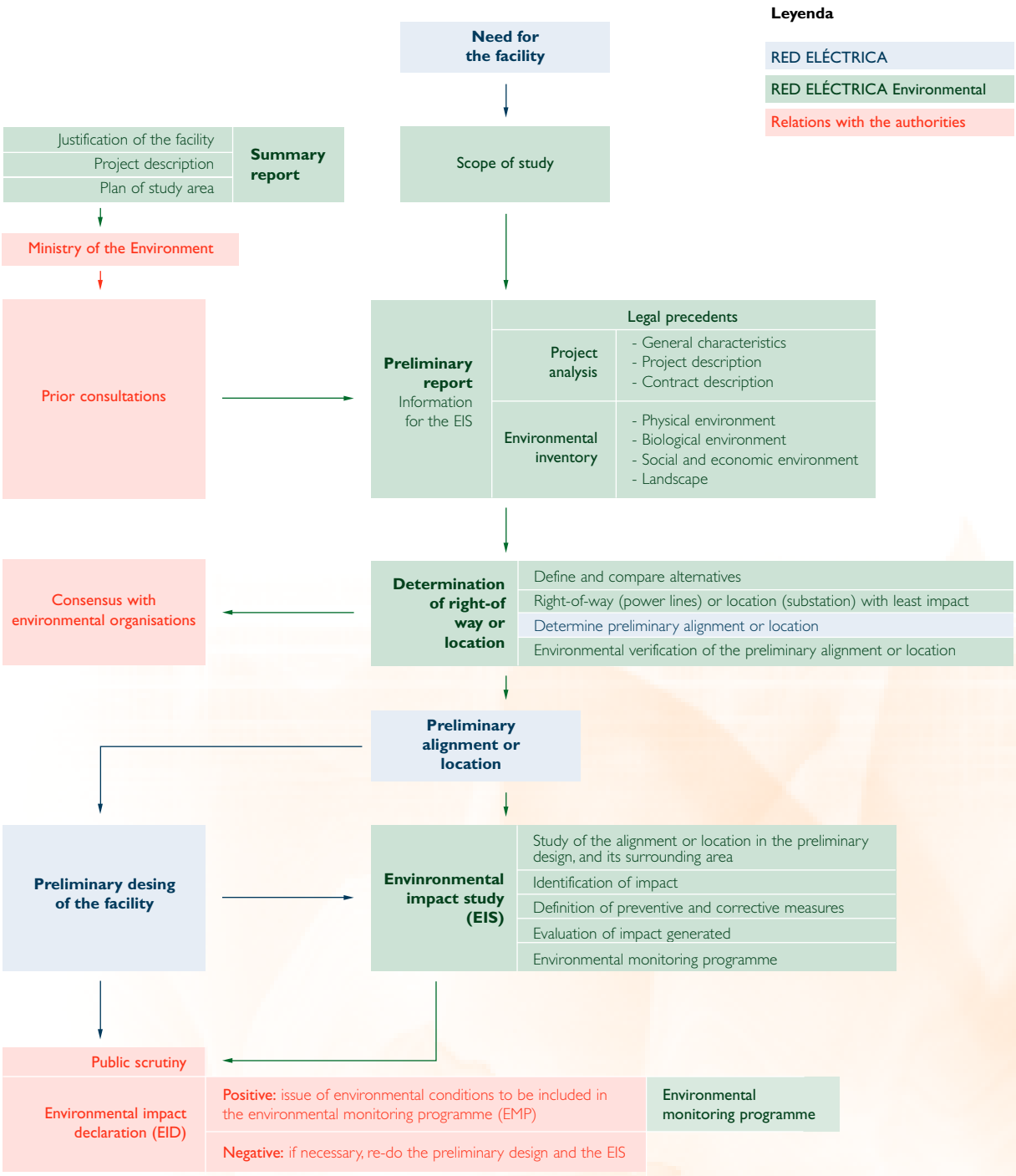
A diagrammatic view of the environmental assessment procedure and the environmental impact assessment procedure that apply to Red Eléctrica's projects, is shown below.

Environmental assessment procedure



[1] Environmental monitoring programme

Environmental impact assessment procedure



The table below shows the environmental impact studies and environmental studies for facilities under design in 2003 and a map showing their location.

Environmental impact assessment procedure

Positive enviranmental impact declarations (EID)	**Enviranmental impact studies pending EID**
L/Muruarte - Castejón	L/Balboa - Frontera Portuguesa
L/Nueva Escombreras - Alimentación Murcia - Rocamora	L/Sentmenat - Bescanó
L/Palos - Guillena	S.E. Ayora
S.E. Muruarte	S.E. Penagos
S.E. Morella	

Environmental assessment procedure

Positive enviranmental assessments		**Enviranmental assessments pending decision**	
S.E. Fuendetodos	S.E. Santa Engracia	S.E. Abanto	S.E. La Espluga y L E/S
S.E. Olmedo	S.E. Segovia	S.E. Aguayo	S.E. Puebla de Don Rodrigo

Environmental impact studies finished or in progress

Power lines (Underground, underwater and overhead)			**Substations**
2º cable Interconexión España - Marruecos	L/Fuendetodos - Mezquita	L/Peñalba - Salas	S.E. Bescano *
Cable Subterráneo Santa Coloma - Collblanc *	L/E/S Galapagar	L/Pesoz - Tineo	S.E. La Espluga y L/E/S *
L/Collblanc - L/Rubí - Begues	L/Galapagar - Moraleja de Enmedio	L/La Roda - Cabra	S.E. Requena y L/E/S
L/Abanto L/Penagos - Güeñes	L/Garraf - L/Vandellós - Begues	L/Segovia - Galapagar	S.E. Torrente y L/E/S
L/Abanto - Zierbena	L/Güeñes - Itxaso	L/Soto - Penagos	S.E. El Cereal
L/Adrall - Frontera Andorra	L/Lastras - San Sebastián de los Reyes	L/Tineo – Las Regeras	
L/Arcos - La Roda	L/Magallón - La Serna	L/Tordesillas - Segovia	
L/Bescanó - Maçanet	L/Mesón - Puentes	L/E/S Torremendo de L/ Escombreras - Rocamora	
L/Bescanó - Frontera Francesa	L/Mezquita - Morella	L/Trives - Tordesillas	
L/Boimente - Pesoz	L/Muruarte - L/Cordobilla - Orcoyen	L/Vitoria - Muruarte	
L/Cabra - Guadame	L/Penagos - Güeñes		

* Environmental impact studies not subjected to the environmental impact assessment procedure.

Environmental studies finished and in progress

Subestations			
S.E. Ayora	S.E. La Lora y Línea E/S	S.E. El Palo	S.E. La Roda
S.E. Muniesa	S.E. Salzadella y Línea E/S	S.E. Pesoz	S.E. Rubí
S.E. Cabra	S.E. Mezquita	S.E. Las Regeras	S.E. Salas
S.E. Garraf	S.E. Monzón	S.E. Requena	S.E. Tineo

Before starting construction, the environmental monitoring programme and/or the environmental specifications are drawn up. These documents are based on the environmental impact study, the environmental impact declaration and the approved environmental assessment (if applicable). They indicate the environmental aspects to be considered in the construction and maintenance phases and the preventive and corrective measures to be taken. The effectiveness of these measures will be monitored through environmental supervision on site.

The table below lists the facilities with environmental supervision in construction in 2003 and there is a map of their location.

Environmental supervision of lines

Underground cable	Power lines	Second circuits
Cable S.S. de los Reyes - Morata/Loeches	L/Fuentes de la Alcarria - L/Trillo - Loeches	L/Cartelle - Lindoso
	L/Mudarra - La Olma	L/Litoral - Rocamora
	L/E/S Nueva Escombreras - L/Escombreras - Rocamora	L/Valdecaballeros - Guadame
	L/Palos - Guillena	
	L/Puerto de la Cruz - L/Pinar - Tarifa	
	L/Santurce - Zierbena	

Environmental supervision of substations and buildings

New construction	Extensions and improvements	
S.E. Almazán	Building of Eliana	S.E. Magallón
S.E. Arcos	S.E. Begues	S.E. Mesón
S.E. Fuendetodos	S.E. Boimente	S.E. Montearenas
S.E. Morella	S.E. Cartelle	S.E. Mudarra
S.E. Nueva Escombreras	S.E. La Eliana	S.E. Puentes
S.E. Palos	S.E. Fuencarral	S.E. Rueda de Jalón
S.E. Puerto de la Cruz	S.E. Guadame	S.E. Siero
S.E. Santa Engracia	S.E. Guillena	S.E. Torrearenillas
S.E. Virtus	S.E. Gurrea	S.E. Valdecaballeros
S.E. Zierbena	S.E. Lancha	S.E. Villablino
	S.E. Litoral	

6.2 Aspects related to maintenance activites

The activities of RED ELÉCTRICA that have the potential to generate environmental concerns are shown below together with the corresponding types of aspect.

Activities that generate environmental aspects

Activities	Groups of environmental aspects
Presence of the building	Fire
Presence of the power line	Bird collisions
	Presence of the power line
Presence of the substation	Presence of the substation
Transmission equipment and transformers	Noise
	Generation of electromagnetic fields
	Fire through faults in the power line
Maintenance of gardens and compounds	Treatment with herbicides, algaecides, insecticides and rat poison.
Maintenance of power line right-of-ways	Clearing, trimming and pruning
	Fire caused by burning vegetation
Maintenance of power line pylons	Removal of bird nests
Use of machinery to maintain power lines	Noise
Use and maintenance of equipment:	
• Generator sets	Emission of combustion gases and noise
• Fuel tanks	Fuel spillage
• Evaporating condensers	Emission of contaminating particles
• Air-conditioning equipment	Emission of HCFCs (R-22)
• Current transformers and reactors	Oil leaks or spillage Fire and/or explosion
• Power machines	
• Auxiliary transformers	
• Oil collection pits	
• Equipment with sulphur fluoride	Emissions of sulphur fluoride
Transfer of oil during equipment maintenance	Oil leaks or spillage
Stockpiling and/or storage of contaminants	Oil
	Fuel
	Antioxidants
	Pesticides
	Nickel cadmium batteries
	Solvents
	Paint
	Sulphur fluoride
	Equipment with contaminants
	Items from the kitchen, cleaning and gardening services
Consumption	Electricity
	Water
	Paper
Storage and elimination of waste*	Not dangerous
	Dangerous
	Sanitary
	Radioactive

* Chapter 7.3 "Waste" provides more detail of these aspects.

Identification and assessment of environmental aspects is carried out in each territorial division at RED ELÉCTRICA. These are the head office, CECOEL 2 and the five regions.

Of all identified environmental aspects, those which were found to be significant following assessment in 2003 were as follows:

- **Birdlife**
  El aspecto "Afección a la avifauna por retirada de nidos" ha resultado significativo en tres demarcaciones por la retirada autorizada de nidos de cigüeña blanca.

- **Vegetation**
  The aspect "Effect on vegetation by clearing, trimming and pruning" was found to be significant in three regions due to authorised trimming of protected vegetation.

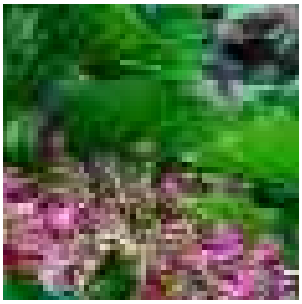
- **Use and maintenance of equipment**
  The aspect "Risk to the environment through spillage from fuel storage tanks" was significant in one region due to the lack of preventive measures for three fuel tanks at one substation. These tanks will be overhauled in 2004.

  The aspect "Risk to the environment through spillage or leaks of oil from auxiliary transformers" was significant in all regions due to the lack of preventive and corrective measures for transformers with capacities of less 1000 litres. The analysis and proposal of preventive measures will be carried out in 2004.

- **Transmission and transformers**
  The aspect "Risk to the environment through fire caused by faults in a power line" was significant in all regions because three fires occurred under power lines in the Bética region. In all three cases action was taken immediately in the form of the appropriate preventive and corrective measures.

- **Consumption**
  The aspect "Effect on the environment through consumption of electricity" and "Effect on the environment through consumption of water from the water supply" were significant in three regions. The aspect "Effect on the environment through consumption of underground water" was significant at headquarters and in two regions.

However, electricity and water consumption is not representative of activities at Red Eléctrica's facilities because it is not linked to production. The consumption of water and power are the consequence of office activities and maintenance of facilities. It varies according to weather conditions. Thus



a reduction in such consumption is achieved thanks to good management focused on enhancing the awareness of all employees regarding proper use of resources on a daily basis.

The aspect "Effect on the environment through the consumption of paper" was significant in three regions. However, the general consumption of paper at all RED ELÉCTRICA facilities is remarkably low thanks to good management and the awareness of employees regarding protection of the environment.

- **Waste**

  Aspects that were found to be significant were as follows:

Variation in average electricity consumption kWh/day inv/m²

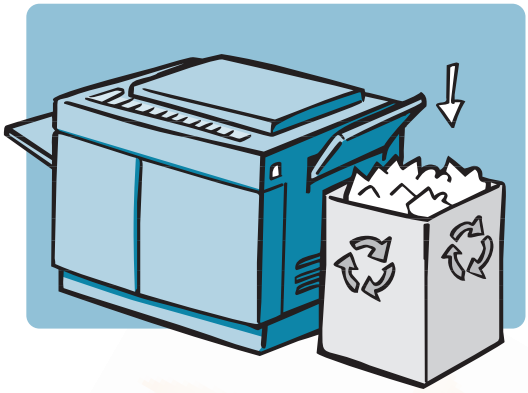
	2001	2002	2003
Average consumption	0,47	0,43	0,58

Average consumption of water m³/day inv

	2001	2002	2003
Average consumption	6,22	8,24	6,58

Variation in the average consumption of paper kg/person/year

	2001	2002	2003
Average consumption	33,86	33,17	34,45



Waste

Non-dangerous waste	**Significant due to:**
Effect on the environment by storage and/or removal of timber	Lack of data
Dangerous waste	**Significant due to:**
Effect on the environment due to storage and/or elimination of nickel-cadmium batteries	Quantity
Effect on the environment due to storage and/or elimination of used oil	
Effect on the environment due to storage and/or elimination of oil with PCB	Danger
Effect on the environment due to storage and/or elimination of spoil contaminated with hydrocarbons	Quantity
	Incorrect storage

Chapter 7.3 "Waste" contains more details on these aspects.

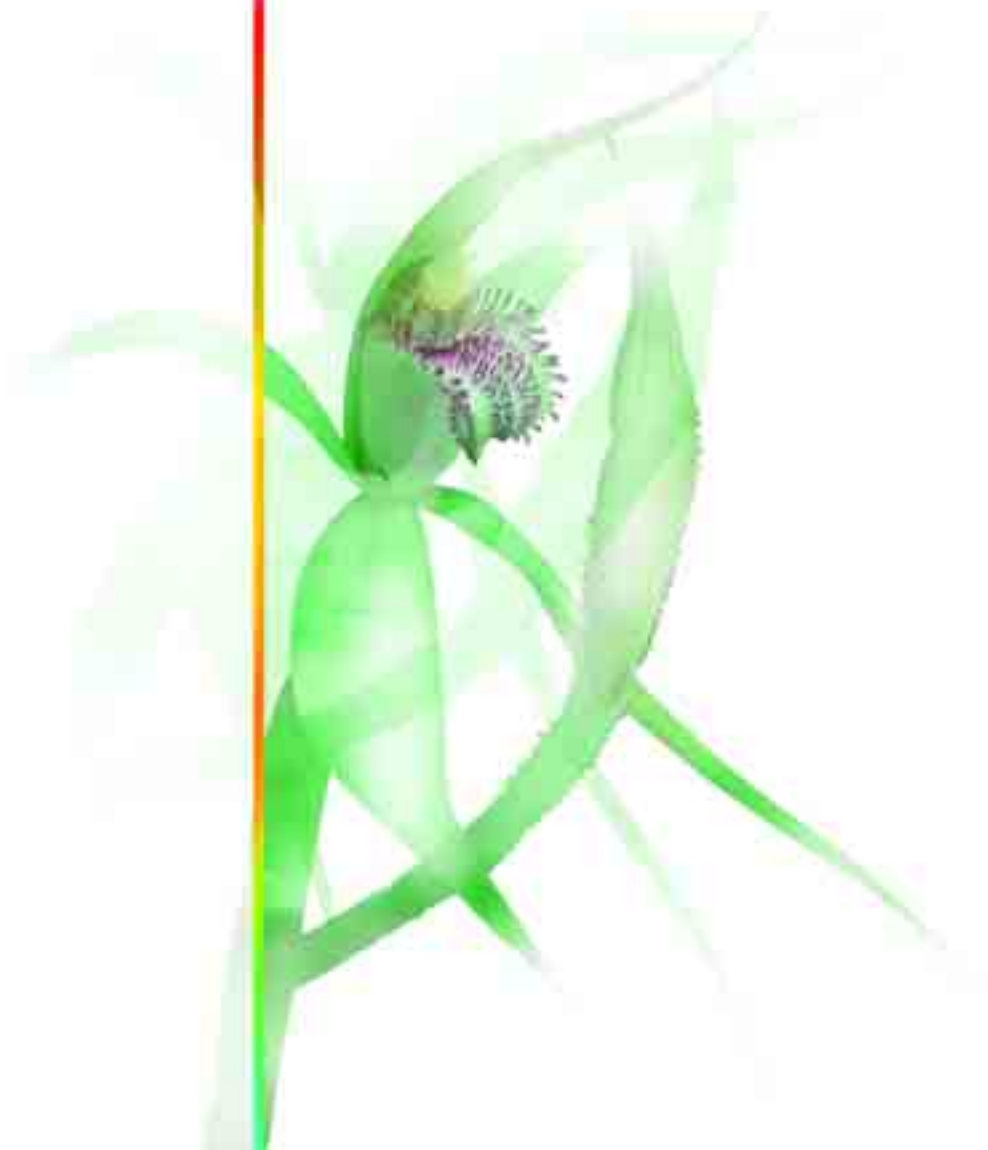
The table below shows the percentage of aspects in recent years that was found to be significant. The low figures in last three years reflect the quality of RED ELÉCTRICA's environmental management.

Percentage of significant aspects

	2001	2002	2003
Headquarters	10,53 %	10,81 %	7,80 %
CECOEL 2	6,45 %	3,45 %	0 %
Bética region	10,77 %	12,70 %	13,63 %
Duero- Sil region	19,35 %	11,48 %	12,69 %
Ebro region	9,23 %	6,25 %	9,09 %
Mediterranean region	7,94 %	6,56 %	6,80 %
Tajo region	8,20 %	8,33 %	9,80 %
Total	**10,65 %**	**8,51 %**	**9,30 %**

Chapter 7

Environmental actions



RED ELÉCTRICA defines and applies preventive and corrective measures to prevent or reduce the effect of its installations and activities on the environment.

The diversity of the terrain where these facilities are located means that the various phases (engineering, construction and operation) of each will have its own environmental characteristics. Thus, preventive and corrective measures are defined in each case for the actual conditions of the facility and its surrounding area

In the engineering phase the preventive and corrective measures for a particular facility are defined by the environmental impact studies (EIS or ES). These studies are contained in the environmental impact declaration or in the environmental assessment (depending on the situation), in the corresponding environmental supervision programme and in the environmental specification.

The preventive and corrective measures mentioned above are applied during

construction. Environmental supervision checks their application and effectiveness. If these measures are found to be insufficient, others will be established to resolve any problem that was not foreseen.

Maintenance of facilities in service is carried out in a systematic manner in accordance with the internal standards for each activity. Any environmental effects are detected during periodic inspections of facilities and through environmental audits carried out during the year. This allows preventive and corrective measures to be defined and applied and checks the effectiveness of measures taken during the construction phase.

Details are given below of some of the environmental activities carried out in the different phases during the year.

Environmental goals and targets in 2004

Phases	Indicators	2003
Engineering	Landscape simulations / Substations with EIS/ES	31 %
Construction	Landscape restoration / New facilities constructed (1)	33 %
	Archaeological surveys / New facilities constructed	47 %
In service	km of alignment marked / total km of alignment	2.68 %
	km of alignment in the Natura 2000 network / total km of alignment	25 %

(1) Completed projects

7.1 Preventive and corrective measures in facility engineering and construction

Those environmental activities related to engineering and construction, where the corrective and preventive measures in 2003 were noteworthy (either due to the characteristics of the environment or the characteristics of the facility) are shown below.

Environmental activities associated with engineering. Environmental impact studies

• Underground and underwater cables

2º Interconnection between Spain and Morocco

Characteristics of the environment / facility	Preventive and corrective measures
• Presence of fish species of economic interest	• Location of fishing grounds for these species
• Effect on a site of Community importance - "Playa de los Lances"	• Study to locate prime habitats • Determine compensatory measures with the co-operation of the Migres Foundation
• Presence of archaeological remains in the area	• Archaeological survey • Location of remains on the underwater section

• Overhead power lines

The Galapagar Reversible Line

Characteristics of the environment / facility	Preventive and corrective measures
• Effect on the site of Community importance (SCI) "Cuenca Alta del Manzanares" which is also a biosphere Reserve	• Location of pylons close to tracks • Installation of bird-savers • Greater height of the catenary to avoid clearing a safety right-of-way
• Area with high archaeological potential	• Impact study on the archaeological heritage

The Mesón-Puentes Line

Characteristics of the environment / facility	Preventive and corrective measures
• Crossing of water courses with birdlife movements	• Installation of bird-saver devices
• Presence of leafy masses and riverbank vegetation	• Increasing the height of pylons
• Presence of areas defined as priority habitats in the Habitat directive	• Cross-country access
• Presence of all archaeological remains in the area	• Impact study on the archaeological heritage

The Palos-Guillena Line

Characteristics of the environment / facility	Preventive and corrective measures
• Proximity of areas with presence of bird species of interest	• Installation of bird-savers on 26% of the line
• Crosses the SCI "Dehesa del Estero y Montes de Moguer"	• The alignment follows the proposal of the Huelva provincial Environmental Office and of the Odiel Natural Wetlands Department, avoiding the area of greatest interest for preservation
• The Guadiamar River Ecological Corridor	• The alignment follows the proposal of the Seville provincial Environmental Office, avoiding effects on birdlife and forestry areas as far as possible

The Penagos-Güeñes Line

Characteristics of the environment / facility	Preventive and corrective measures
• Presence of areas defined as priority habitats under the Habitat Directive (species of orchids)	• Detailed study prior to opening access routes • Planting of affected orchids in other areas
• Crosses areas of indigenous woods	• Higher pylons • Selective lopping and minimum clearing of right-of-way
• Proximity to areas with bird species of interest	• Biological grace period from February to July • Installation of bird-saver devices
• Crosses rivers catalogued as SCI	• Lifting the catenary to avoid safety clearing of right-of-way
• Presence of archaeological remains in the area	• Archaeological survey • Archaeological an seismological survey where the line crosses the Cobrantes Cave area

The Soto-Penagos Line

Characteristics of the environment / facility	Preventive and corrective measures
• Crosses areas of indigenous woods	• Higher pylons • Selective lopping and minimum clearing of right-of-way
• Proximity to areas with bird species of interest	• Installation of bird-saver devices
• Presence of areas of archaeological interest	• Archaeological survey

• Substations

La Espluga Substation

Characteristics of the environment / facility	Preventive and corrective measures
• Presence of archaeological remains in the area	• Impact study on archaeological heritage

Olmedo Substation

Characteristics of the environment / facility	Preventive and corrective measures
• Area with high archaeological potential	• Impact study on archaeological heritage
• Location among pine trees	• Ideal location among pine trees (landscape restoration not necessary as it will be hidden)

Segovia Substation

Characteristics of the environment / facility	Preventive and corrective measures
• Presence of archaeological remains in the area	• Impact study on archaeological heritage
• Location in rural area	• Landscape restoration design

Environmental activities related to construction. Environmental supervision

• Underground cable

The San Sebastián de los Reyes - Morata/Loeches Cable

Characteristics of the environment / facility	Preventive and corrective measures
• Crosses the Jarama River (proposed SIC) • Presence of riverbank vegetation	• Use of a tunnelling machine to cross the river
• Area with high archaeological potential	• Archaeological survey on site

• Overhead Lines

The Palos-Guillena Line

Characteristics of the environment / facility	Preventive and corrective measures
• Affects the "Ordenados de Moguer" mountain area	• Reforestation with 10 pine trees or cork oaks for each tree or bush damaged or eliminated
• Affects the "La Dehesilla" y "Cerro Palmares" districts	• Biological grace period during the breeding and nesting season of bustards



The Puerto de la Cruz Line - Pinar-Tarifa Line

Characteristics of the environment / facility	Preventive and corrective measures
• Presence of areas defined as priority habitats under the Habitat Directive	• Detailed study to determine access de los accesos
• Passes through the Alcornocales Nature Reserve	• Selective trimming or lopping in accordance with the Park Director • Agreements with the Park Director on upgrading the tracks • Installation of bird-saver devices on the entire route • Determination of compensatory measures

The Santurce-Zierbena Line

Characteristics of the environment / facility	Preventive and corrective measures
• Passes through areas with very steep inclines	• Upgrading of tracks and restoration of existing meadows • Landscape engineering to stabilise slopes that might collapse.
• Presence of protected flora	• Expert botanical study to define the boundaries of protected species • Determination of a protection parameter
• Presence of an area of Natural Interest	• Compact exit section using quadruple circuit pylons

• Stringing of second circuits

The Cartelle-Lindoso Line

Characteristics of the environment / facility	Preventive and corrective measures
• Passes through the Natural Baixa Limia-Serra do Xurés Nature Reserve	• Selective lopping (respecting indigenous trees and riverbank vegetation) in accordance with the Park Director • Agreements with the Park Director to upgrade tracks

The Valdecaballeros-Guadame Line

Characteristics of the environment / facility	Preventive and corrective measures
• Presence of stork nests on pylons	• Biological grace period during the breeding season
• Presence of imperial eagle nests close to the line	• Biological grace period during the breeding season • Installation of bird-saver devices
• Estates with high game value	• Grace period during the hunting season
• Passes through the Cardeña and Montoro Nature Reserve • Crosses protected natural spaces set up after construction of the line (SCI and Special Protection Area for Birdlife –SPAB– "Puerto Peña-Los Golondrinos", SCI "Alcornocales del Zumajo", SPAB "Sierra de Canalizos", SCI and SPAB "Sierra Morena" and SCI "Río Gualdalmez")	• Selective lopping • Agreements for upgrading tracks • Installation of bird-saver devices in sensitive areas

• Substations

Cartelle Substation

Characteristics of the environment / facility	Preventive and corrective measures
• Close to a town	• Landscaping work

Morella Substation

Characteristics of the environment / facility	Preventive and corrective measures
• Proximity to a rock painting station (Gravats de Freiximen) — considered a Cultural Asset	• Red Eléctrica provides the resources to restore the engravings and carry out archaeological excavations • Archaeological survey prior to the start of earthmoving

7.2 Preventive and corrective measures in facility maintenance

The main activities in 2003 are shown below.

Activities related to the **protection of birdlife:**

- As a result of the co-operation agreement signed with the council for agriculture, water and the environment of the Murcia regional government to protect and regenerate the population of Bonelli's eagle, various sections of the Litoral-La Asomada power line will be marked inside the "Almenara Sierra, Las Moreras and COPE Cape" Special Protection Area for Birdlife (SPAB).

- Marking activities were carried out on the Valdecaballeros–Guillena line as a result of the co-operation agreement signed with the agriculture and environment council in the Extremadura region in view of the wide diversity of birds in that area and the need to provide protection.

- The 400 kV Guadame-Tajo line has been marked where it passes through the "Laguna

Marking of lines with birdsaver spirals

	total km of power lines	km of lines marked	Percent marked
2000	14,729	296	2.01 %
2001	14,756	319	2.16 %
2002	15,058	403	2.67 %
2003	16,883	451	2.68 %

de Los Jarales" Nature Reserve, including the "South Cordoba Wetlands" SPAB, in accordance with the results of collision monitoring on that stretch.

- Potentially hazardous spans on various lines in Andalucia, Castile and Leon, Castile La Mancha and Extremadura have also been fitted with "birdsaver" spirals.

- Devices for discouraging nesting by storks were also installed in Castile La Mancha and Extremadura.

- Lastly, the table below summarises the marking of power lines with "birdsaver" spirals in the last four years.

Activities related to the p**rotection of the landscape:**

- Proposals were drawn up for landscape improvements at eleven substations, to be carried out from 2003 to 2005. Of the proposals made in 2003, the following have been carried out:
  - Two substations have been fenced off using indigenous plants.
  - The waste areas at two substations have been upgraded.
  - Landscape improvements have been made at one substation in the form of cleaning, removal of waste, etc.
  - Gardening was carried out at one substation.
  - The visual impact of three substations has been minimised by replacing or painting the perimeter fence, equipment, etc.
  - Designs have been drawn up for landscape improvements at two substations

Activities related to the **protection of natural spaces:**

- The geographic information system for areas of environmental interest has been updated with the following goals:
  - To examine the present situation of the transmission grid on the Iberian mainland with regard to the network of protected natural spaces and to other spaces of interest.
  - To carry out the planning studies for new facilities in a manner that will minimise the potential impact on protected natural spaces and other spaces of interest.

Percent of alignment included in the Red Natura 2000

	2003
Percent of alignment passing through areas included in the Red Natura 2000	25 %

Activities related to the **prevention of contamination:**

- For the purpose of assessing the environmental status of the new assets acquired by Red Eléctrica on December 31st 2002, an environmental review was made of the related substations. Any associated risks were identified and evaluated and environmental risk audits were carried out on 76 of the 167 substations.
  The identified risks were grouped as follows: dangerous substances (oil and solvents, PCBs, asbestos, CFCs, halons and radioactive lightning conductors); greenhouse gases (SF6), waste, water (water supply, sewage and storm water); noise, soil contamination by previous activities or by neighbours; and legal documentation.
  In view of the results, necessary preventive and corrective measures were taken in each case to reduce present environmental risks.

- In addition trays were installed to control spillage from fuel tanks at five substations and fuel tanks of generators have been overhauled at a further six substations. Loss of water from three oil collection pits has been corrected at one substation.

Activities related to the **control of electromagnetic fields and noise:**

- The electromagnetic fields and noise in the proximity of the new 400 kV Santurce-Zierbena power line were measured before and after putting it into service. This was done in accordance with the requirements of the Basque government environmental monitoring programme and it was found that the line complies with the standards.

- Lastly, work has started on the design of an electromagnetic field and noise measurement plan with the goal of measuring these parameters on all Red Eléctrica's power lines and substations over the next five years.

7.3 Waste

Waste is generated by maintenance as well as by the construction of power lines, substations and buildings.

As part of its **maintenance activities,** RED ELÉCTRICA has identified the waste in the table below, which shows the amounts generated in the last three years.

Waste from maintenance activities

	Waste		Amounts (kg) 2001	2002	2003
Residuos no Peligrosos	Sludge from septic tanks		-	50 *	37 *
	Scrap	Metal	1,213,440	1,347,029	1,859,244
		Inert	-	-	407,932
	Paper and cardboard		62,080	103,685	87,609
	Toner		135	356	466
	Timber		1,680	33,827	73,385
	Vegetable waste		12,470	2,180	611,780
	Plastics (1)		-	-	750
	Vegetable oil from kitchens		-	400	320
Residuos Peligrosos	Used oil		157,869	79,065	51,925
	Oil and water mixtures		5,000	14,060	178
	Transformers with PCB (2)		4,600	0	0
	Oil with PCBs		0	0	3,238
	Lead batteries		1,112	1,097	3,436
	Nickel/Cadmium batteries (3)		259	15	13,323
	Small batteries		76	262	120
	Fluorescent tubes		281	341	258
	Hydrocarbon impregnated soil		3,522	800	10,495
	Containers that have held dangerous substances		318	448	1,134
	Absorbent and filter materials, cleaning cloths and protective clothing contaminated by dangerous substances		603	550	1,909
	Silica gel (4)		-	-	113

*Amounts in m^3

(1) These started to be handled separately this year

(2) Transformers with PCB (with more than 500 ppm of contaminant) were eliminated in 2001.

(3) Many Ni/Cd batteries have been replaced

(4) New waste item. (This product is being replaced)

Maintenance activities do not imply regular generation of waste, either in terms of type or quantity. This is the reason why there are large variations in the figures for different years.

For this reason it is difficult to set targets for minimising waste. Therefore improvements are aimed at finding the most appropriate method of handling the waste, through re-use, recycling or sale of items of waste where this is possible. The final destination of waste generated in 2003 is shown below:

Before the start of work Red Eléctrica provides contractors with copies of the corresponding environmental specifications (these are part of the contractual conditions). This is done to control waste generated by construction activities. The specifications define the corresponding storage and handling requirements.

In addition, the environmental specifications contain the table below which must be completed and given to the environment department. The table lists the amount of waste generated and the steps taken. It must be possible to justify these steps to environmental supervision and to in-house audits by means of records.

Non-dangerous waste		**Destination**
Sludge from septic tanks		Purification / Elimination
Scrap	Metal	Recycling
	Inert	Elimination
Paper and cardboard		Recycling
Toner		Recycling
Timber		Resale / Elimination
Vegetable waste		Add to soil / Resale / Elimination
Plastics		Recycling
Vegetable cooking oil		Resale

Dangerous waste	**Destination**
Used oil	Recovery / Resale
Oil and water mixtures	Recovery / Resale / Elimination
Oil with PCBs	Decontamination and destruction
Lead batteries	Lead recovery / Elimination
Nickel cadmium batteries	Elimination
Small batteries	Recovery / Elimination
Fluorescent tubes	Recovery / Elimination
Non-halogenated solvents	Elimination
Hydrocarbon impregnated soil	Elimination
Containers that have held dangerous substances	Recycling / Elimination
Absorbent and filter materials, cleaning cloths and protective clothing contaminated with dangerous substances	Resale / Elimination
Silica gel	Elimination

Control waste generated

	Type of waste	Date (or period) of generation	Amount generated	Type of handling	Date of handling
Non-dangerous	Spoil				
	Rubble				
	Forestry waste				
	SUW: remains of food, plastics…				
	Paper and cardboard				
	Timber				
	Scrap				
	Other:------				
Dangerous	Paint remains				
	Absorbent and filter materials, cleaning cloths, protection clothing, etc contaminated by dangerous substances (fats, solvents, etc)				
	Containers that have held dangerous substances (see pictogram)				
	Oil impregnated soil				
	Others:------				

7.4 Emergency plans

Environmental incidents are defined as situations where emergency action may be required due to the possible effect on the environment.

There are a series of preventive measures that can avoid these situations and lines of action have been defined. Although there are specific details for each type of incident, the basic and general manner of acting in the case of both maintenance and construction activities, is shown in the diagrams below:

Incidents and actions on environmental issues

Environmental incidents

- Flooding
- Fire
- Explosion
- Spillage and leaks of contaminating material
- Emission of contaminating substances

Action in the event of environmental incidents

Personnel in general

- Commence any measures immediately available
- Notify the safety service

Emergency supervisor

- Determine if the situation can have environmental consequences

The Environment Department

- Provide the means necessary to combat the incident
- Evaluate the environmental impact produced by the incident
- Set up the necessary corrective measures

The table below shows the accidents that have occurred at Red Eléctrica in the last five years and for 2003 alone:

After considering the environmental consequences of the accidents, it can be seen that they were few in number and the environmental effect was low.
The most frequent accidents were leaks and spillage of contaminating material, followed by fires. In 2003 there were three fires due to power line faults and in all cases action was taken immediately, applying the necessary corrective measures. As a preventive measure to avoid the consequences arising from this type of accident, work is being done to clean up the right-of-ways and to ensure the minimum safety distances are maintained.

Accidents at RED ELÉCTRICA

	Total	In 2003
Explosions:	**2**	**1**
- Power machines	-	-
- Current transformers (CT) and capacitor voltage transformers (CVT)	2	1
Fire	**5**	**3**
- Due to line faults	5	3
- Due to burning forest waste	-	-
Spills and leakage (use, maintenance, storage)	**6**	**1**
- Fuel tanks	2	-
- Oil in power machines	1	-
- Auxiliary transformer oil	1	-
- CT and CVT oil	-	
- Circuit breaker oil	-	
- Contaminants in stored equipment	1	-
- Movement of equipment during maintenance	1	1
Other	**3**	**-**
- Flooding of carpark and pump room	1	-
- Pylon collapse	1	-
- Mixture of bleach and nitric acid by cleaners	1	-

7.5 Suppliers and contractors

One of the principles of RED ELÉCTRICA's environmental policy is to ensure that suppliers comply with the environmental requirements of the company. Therefore for this purpose the following activities were planned and carried out in 2003 to enhance environmental control of suppliers and contractors and thus improve protection of the environment in those activities of RED ELÉCTRICA that affect the natural surroundings.

- Work continued on a programme led by the Entorno Foundation – Environmental qualification of suppliers and contractors. The goal is to encourage these companies to set up environmental management systems that can be certified. It consists of a training plan which provides them with the necessary know-how to meet the requirements of the UNE-EN ISO 14001 standard and of the EU Environmental Management and Auditing System (EMAS) in a progressive manner.

- During this phase of the programme RED ELÉCTRICA invited those suppliers and contractors whose activities have a potential effect on the environmental to participate in the training programme and 17% of the total attended.

- In addition, a workshop was set up on the environmental supervision of power line and substation construction for technical staff associated with environmental monitoring. The aim of these workshops is to entrench good environmental practice.

In 2004 it is planned to set up a working group for all RED ELÉCTRICA units whose activities entail a direct relationship with suppliers and contractors. The purpose of this working group is to improve the existing qualification system for suppliers and contractors. Work will be done to define the obligatory environmental criteria for these companies, which will thus be the minimum criteria when orders are placed.

Chapter 8

Reasearch and development

RED ELÉCTRICA's activities attract considerable attention from the public and this, together with its own interests, leads it to fund a continuous programme of active research. This takes the form of co-operation with other organisations and government agencies on studies and projects associated with protection of the environment.

The environmental research projects carried out by Red Eléctrica in 2003 are detailed below:

- A project was started on **currents induced in the human body by industrial frequency electromagnetic fields** in co-operation with UNESA and with the Salvador Velayos Institute of Applied Magnetism (which is supported by the Complutense University of Madrid and the Scientific Research Board). The goal is to develop a method of calculating currents induced in the human body by industrial frequency electromagnetic fields (50 Hz). It will help to determine if any of Red Eléctrica's activities exceed the allowable levels.

- A project on the **effect of low frequency electromagnetic fields on programmed cellular death (PCD) – implications for the immune system.** This project was started in 2002 with scientific co-operation from Valladolid University, the Scientific Research Board and UNESA. It is a continuation of the project conducted by these organisations from 1995 to 2000. The purpose of the study is to clarify whether electromagnetic fields generated by electrical installations have any effect on apoptosis – a mechanism involved in pathologies such as degenerative diseases or in alterations to the immune system of adult organisms. After in vitro experiments were completed in 2003, research continues with in vivo experiments to see the effect on adult animals and to determine the conditions under which the effect arises.

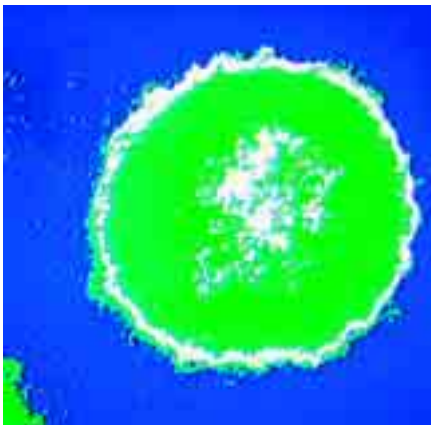
- Co-operation with the Doñana Biological Station (under the Scientific Research Board) in a study on **the use of Red Eléctrica's power substations by the lesser kestrel (Falco naumanni) in Navarre and Aragon – their importance for preservation of the species at national level.**
  This study revealed a surprising fact: there are flocks of thousands of lesser kestrels (Falco naumanni) at substations owned by Red Eléctrica in Navarre and Aragon. A census of the lesser kestrel revealed a population of 3,082 in the whole of Spain. Of these 93.8% are concentrated at four substations and three of these are owned by Red Eléctrica. They are the Peñaflor, Magallón and La Serna substations. The flocks of lesser kestrels at substations are the largest ever observed anywhere on the Iberian peninsular.

- Work continues on the project **Use of power line supports for nesting by birds of prey.** This is being conducted in conjunction with the wild life section of the territorial service of the environmental council of the Castile and Leon Autonomous Community. Red Eléctrica is co-operating on this project, whose goal is to protect the peregrine falcon (Falco peregrinus) in the province of Valladolid.
  In 2003 a total of 18 nests of the peregrine falcon were detected on the pylons of five power lines. Six nests were artificial ones and the remainder entailed reuse of old crow nests. The results indicate that an important of these birds in this province (approximately 60%) are nesting on pylons which thus play a significant ecological role where the natural habitat lacks adequate supports for bird nests.

- Work continues on the **tracking of white stork (Ciconia ciconia) nesting habits.** The goal is to find practical solutions to power line maintenance problems without undermining the important ecological role that pylons play on occasions as a support for bird nests. In 2003 work continued on tracking of white stork (Ciconia ciconia) nesting habits and the effectiveness of devices to discourage this (a device was patented in 2000). These devices are installed on pylons in Andalucia, Castile and Leon, Extremadura and Madrid.

- Co-operation with the forest pathology unit of the woodlands and pasture cultivation

department of the faculty of mountain engineers of the Madrid Polytechnic University on the project **treatment of tree stumps by biotic and abiotic means in power line right-of-ways.** This was started in 2003 with the goal of developing a method of preventing renewed growth of these tree stumps which, due to their fast growth characteristics, could pose a threat to the safety distances. An initial inoculation campaign has been completed in various parts of the mainland and the results are expected next year.



Chapter 9

Training

RED ELÉCTRICA believes that training of its personnel and its suppliers and contractors in environmental matters is a strategic tool that will permit it to develop the necessary skills to integrate environmental protection with its business functions. Each year the human resources department draws up a training plan that covers the requirements detected by the different areas of the company in environmental questions.

The table below shows the training activities for RED ELÉCTRICA employees on environmental aspects in 2003:

Training activities

Course	Aimed at
Environmental supervision of power line and substation construction projects	Site supervisors for power lines and substations
Felling, trimming and access	Power line maintenance personnel
Environmental management system and waste management	Recently appointed environmental support personnel
Environmental management system auditors	Environment department personnel
Management of the company's environmental risks	
European legislation for people in charge of environmental issues	
New legislation on waste in the Madrid autonomous community	
Economic impact of rules on climate change	
Sound measurement equipment	
Practical course on acoustics and noise control	

During 2003 a three-year environmental development plan (2004-2006) was drawn up. It includes the training requirements for all the company's areas and a schedule for these activities.

Three-year environmental development plan (2004-2006)

Training activity	Goal	Aimed at	Year
Environment management system (SIGMA)	Raise employee awareness of the importance of complying with environmental policy, with procedures and with the SIGMA requirements. This also applies to any significant environmental impact of their activities and the environmental benefits of better behaviour by personnel.	• All employees	2004
Environmental procedures for facilities	To gain in-depth knowledge of the methodology associated with environmental impact studies for power lines and substations, and the approval processes	• Project managers • Regional managers	2004
Protected natural spaces and the Natura 2000 network in facility planning operations	To learn about the natural protected spaces network and the Natura 2000 network and to incorporate environmental concerns in facility planning.	• The grid development department • Project managers	2004
Sustainability	Make staff aware of the need to apply sustainability criteria in the company's activities and decisions, integrating financial, social and environmental concerns in line with the directives of the European Union.	• All employees	2005
Environmental supervision of power line and substation projects	To learn and understand the environmental impact caused by the construction of high-voltage power lines and substations and to learn how to manage environmental factors in accordance with SIGMA.	• Power line and substation construction department • Suppliers and contractors	2004
Good environmental practice in facility maintenance	To learn about the environmental impact caused by high-voltage power line and substation maintenance and about the SIGMA requirements.	• Regional technicians • Suppliers and contractors	2004 2005
Felling, trimming and access	To learn the features of a forest and the relationship between fauna and vegetation so that felling, trimming and clearing activities can be carried out in accordance with environmental criteria.	• Regional personnel	2004 2005
Installation of devices to discourage nesting	To acquire the knowledge and skills needed to increase the efficiency of devices that discourage nesting	• Regional technicians • Suppliers and contractors	2004
The environmental management system and building maintenance	To learn the duties and responsibilities of each job position so that the environmental policy and the SIGMA requirements can be applied.	• Regional and area office technicians • Substation department • Suppliers and contractors	2006
Electromagnetic fields and noise	To learn the environmental impact of electricity at Red Eléctrica's installations (description, rules, measurements, impact on population, etc).	• Regional managers • Regional supervisors • Project managers • Project management department	2005

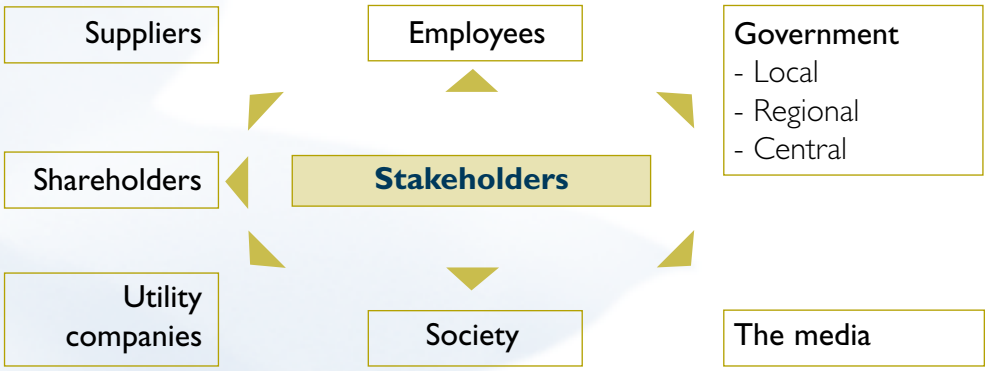
Chapter 10

Communications

RED ELÉCTRICA is conscious of the interest aroused by the environmental aspects of its activities and its facilities. It therefore believes that one of its duties as a company is to improve communications constantly, to inform interested parties and to establish a dialogue with them in an open, fluid and continuous manner.

This improvement was confirmed by the prize for the **best environment and sustainability information by Spanish companies** for the company's 2002 environment report. It was awarded by the Spanish Institute of Auditors and the Spanish Accounting and Business Administration Association (2nd edition) for the high quality of the content and the criteria used in its preparation. This award reflected Red Eléctrica's efforts to inform its stakeholders in a clear and transparent manner regarding its activities related to the environment.

Relation with stakeholders



During 2003 the following external communication activities were carried out:

At the beginning of October, Red Eléctrica organised the fourth edition of **the Conference on Power Lines and the Environment.** It was attended by companies from the electricity sector, government authorities, national and international experts, public and private organisations, associations, etc. The aim was to share knowledge and experience, to discuss and reflect on environmental issues related to transmission and distribution of electricity and the role of these issues in the challenge posed by sustainable development.

The company continued to participate in the preparation of the **electrical infrastructure plan for the Madrid Community.** This had been started in 2001 together with other organisations and companies and with departments of the Madrid regional government – co-ordinated by the department of industry, energy and mines for this region. The main object is to plan and establish corridors for high voltage power lines that will ensure the supply of electric energy to the community in the future. Corridors for the north-west and west of the Madrid Community were planned in 2003.

Co-operation agreements were signed or extended with various organisations including the following:

- A co-operation agreement with the Murcia council for agriculture, water and the environment with the goal of protecting and regenerating the population of Bonelli's eagle by marking power lines. This project is included in the Life-Naturaleza scheme for "preservation of Bonelli's eagle (Hieraaetus fasciatus) – Almenara, Murcia" and will be continued till 2006.

- The co-operation agreement with the council of agriculture and the environment of the regional government of Extremadura to assess potentially dangerous sections and to install "birdsaver" devices. This agreement will be extended till 2005.

- An agreement between Red Eléctrica and the Scientific Research Board on a study of the use of Red Eléctrica's power transmission substations by the lesser kestrel (Falco naumanni) in Navarre and Aragon and their importance for preservation of the species on a national level.

- A co-operation agreement on "currents induced in the human body by industrial frequency electromagnetic fields" with the Salvador Velayos Institute of Applied Magnetism (which is supported by the Complutense University of Madrid and the Scientific Research Board) and with UNESA.

- An agreement with the Spanish Official College of Physicists to include information on electrical and magnetic fields on their web site, Physics and Society.

- Scientific co-operation with Valladolid University, the Scientific Research Board and Unesa on a research project into the biological effects of electromagnetic fields on organisms.

- An agreement with the Entorno Foundation to promote environmental improvement at the company. This entails training, information and research in co-operation with the business world.

We also participated in various domestic and international **working groups** on different subjects, together with other technical staff and experts. They included the following groups:

Participation of working groups

Working group	Organisers
The study group on "Environmental behaviour of electricity systems"	CIGRE
The regional electricity infrastructure plan for the Madrid Community	Madrid Autonomous Community
Working group on electromagnetic fields	UNESA
The electrical networks subcommittee of the "Measurement equipment and methods for electromagnetic fields in the human context" committee	AENOR
The working group on "The environment and society"	EURELECTRIC
The working group on "Evaluation of environmental costs"	AENOR
The subcommittee on "Environmental management systems"	AENOR
The working group on "SF6 in the electricity industry"	CIGRE

We also participated actively in domestic and international **events** of various kinds on different subjects such as:

Participation in events

Event	Organisers
Benchmarking sessions with experts and specialists from different countries of the Mediterranean basin on the management and minimisation of industrial waste. (Included in the Azahar Programme)	Ministry of Foreign Affairs
Euromeeting on corporate social responsibility	The Solidarity Foundation and volunteers from the Valencia Autonomous Community
RECS: green certificates and sustainable energy	The Spanish Energy Club
Seminar on "Legal aspects of electromagnetic fields"	UNESA

RED ELÉCTRICA puts various channels of communication at the disposal of the public. These are used to handle **queries and claims** of an environmental nature. The channels include the web site (www.ree.es).

Number of queries

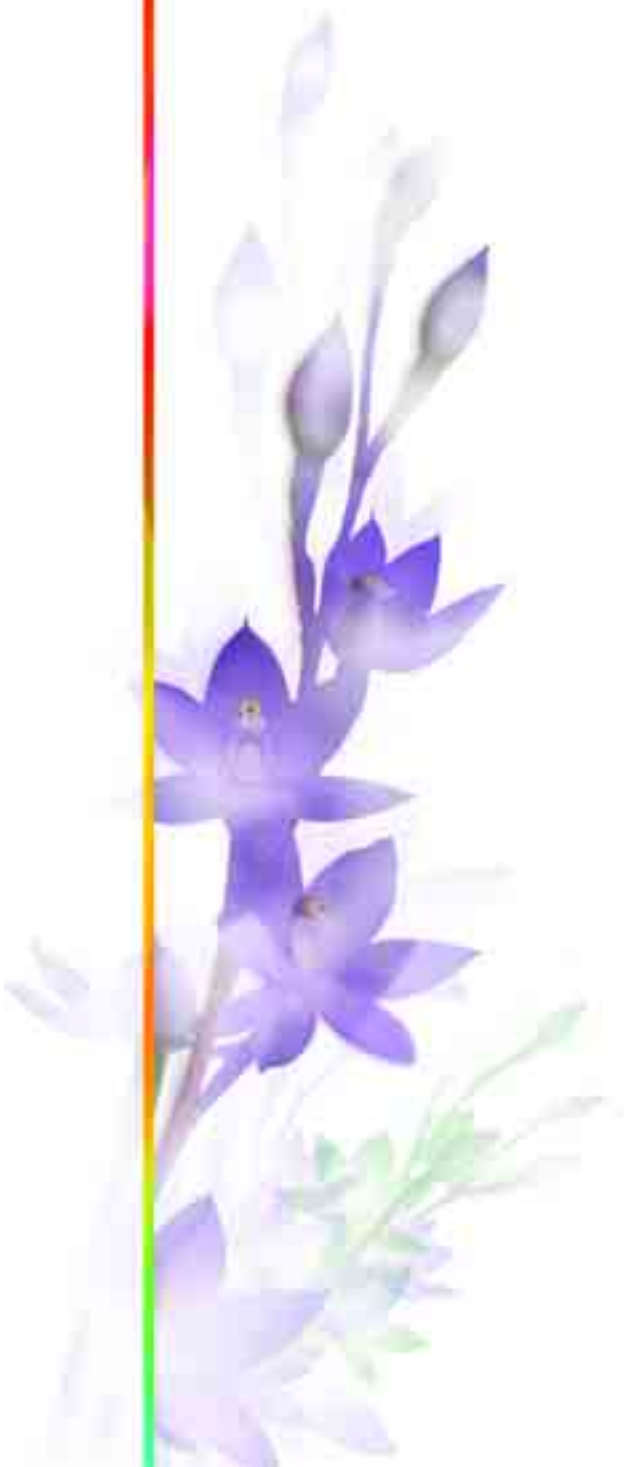
Field	2001	2002	2003
Birdlife	4	5	13
Electromagnetic fields	23	45	8
Green certificates	0	0	4
Facilities	4	5	4
General environmental information	0	6	8
Publications	1	4	11
Noise	0	2	0
Total	**32**	**67**	**48**

Number of claims

Field	2001	2002	2003
Birdlife	1	0	0
Noise	0	2	3
Proximity to facility	1	0	1
Fire risk	1	0	1
Landscape risk	1	0	0
Total	**4**	**2**	**5**

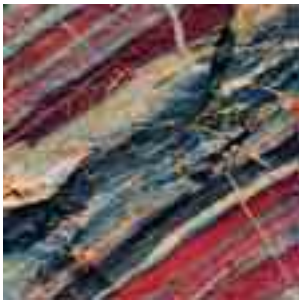
Internal communication activities during the year included the following that are worthy of note:

- A quarterly bulletin with the latest news on 50/60 Hz electrical and magnetic fields.
- Entre Líneas – a magazine with news, activities and significant events at the company. It includes articles on the environment.
- Red en Línea – an on-line publication about the company's activities. It includes articles on the environment.
- Internal web site – a page with details of the company's environmental activities.



Chapter 11

Environmental costs



One of the principles of the RED ELÉCTRICA Group's environmental policy

is "to guide the group towards sustainable development, combining respect for the environment and support for progress and social welfare with business aspects and with the goal of creating value in a persistent manner".

Since 1999 Red Eléctrica has been identifying and calculating the company's environmental costs. The goal is to have an accurate idea of the company's spending on protection of the environment (avoiding, reducing or repairing the damage caused by its operations).

Such financial information provides the company with criteria for decisions on environmental matters that go beyond the immediate costs. The criteria help to detect situations of responsibility, business opportunities and potential benefits.

The environmental costs for 2003 are shown in the table below.

Evolution of the environmental costs

Environmental costs	2002 (Euros)	2003 (Euros)
INVESTMENTS	**1,379,419.18**	**1,575,382.23**
Design and construction of new facilities	1,379,419.18	1,575,382.23
EXPENSES	**2,734,189.29**	**3,956,313.87**
Environment Management System	14,459.31	13,681.54
Preventive and corrective measures at facilities in service	1,878,236.01	2,863,664.74
Protection of birdlife	73,335.67	114,770.26
Protection of vegetation	1,708,421.04	2,495,163.30
Protection of the soil	0	122,087.00
Preservation of protected nature reserves	9,015.00	11,202.02
Noise control	607.71	0
Environmental improvements at substations	43,510.67	65,990.38
Waste handling	43,345.92	54,451.78
Research and development	74,045.03	127,701.05
Training and communication	115,177.55	138,887.75
Training and environmental awareness	15,332.85	15,355.93
Communication	99,844.70	123,531.82
Taxes and levies of an environmental nature	7,209.01	13,205.59
Overheads of environment department personnel	645,062.38	799,173.20

Chapter 12

Legal compliance

RED ELÉCTRICA aims to achieve continuous improvement

and it is making progress in this regard thanks to the increasing concern of employees in their daily tasks. Proof of this commitment can be seen the 65% reduction in the number of violations compared to the previous year.

In 2002 there were 14 violations of which 4 were shelved. One of these resulted in a fine of € 240 for construction activities in a controlled waters area outside the dates established in the corresponding authorisation. Of the 14 violations, 10 were left pending decision at yearend. In 2003, 9 of these were shelved and 1 resulted in a fine of € 150 for removing stork nests outside the dates established in the corresponding authorisation.

In 2003 there were five cases of which one was qualified as serious. This encourages us to continue working and to adopt stricter measures to prevent a repetition of unwelcome situations.

Number of violations

Year	Status			Total
	Shelved	Shelved and fine	Pending	
2002	12	2	–	14
2003	–	1	4	5

Details are given below for each violation, its status and the amount involved.

Violations

Offence	Status of the violation		
	Shelved	Shelved and fine	Pending
Felling and trimming without authorisation	–	1(*)	–
Fire caused by power line discharge	–	–	1
Disposal of non-dangerous waste without authorisation	–	–	1
Construction of a telecommunication shelter without preparing an environmental report	–	–	1
Removal of stork nests with authorisation but without replacing them in an adjacent area	–	–	1
Total	**0**	**1**	**4**

* €1001 plus restoration of the impaired area

Chapter 13

Term of the environmental statement



The purpose of this environmental report is to inform shareholders, customers, suppliers, government authorities, official organisations, entities, associations, groups and society in general

regarding activities of an environmental nature conducted by Red Eléctrica in 2003.

The environmental statement is issued annually. It is published in the form of an environmental report. However, if there have been no important changes in activity since the last statement, it is added as a chapter to Red Eléctrica's annual report.

The Spanish Standards and Certification Association (AENOR) has offices at Calle Genova 6, 28004 MADRID, and is an accredited verifying organisation, number E-V-0001. It verifies that Red Eléctrica's environmental statement complies with the requirements of Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001, allowing voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

The next statement will be presented and made public in the first half of 2005.

Chapter 14

Glossary



Environmental aspect:
An element of the activities, products or services of an organisation that could interfere with the environment.
(Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme – EMAS).

Environmental audit:
An instrument of management consisting in systematic, documented, periodic and objective evaluation of an organisation's efficiency, its system of management and the procedures that protect the environment. Its goal is to help to control activities that could have an impact on the environment. It also evaluates compliance with the organisation's environmental policy – particularly its environmental goals and targets.
(Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme – EMAS).

Electrical field:
At a given point, this is the force exerted on a stationary unit of charge. It is expressed in volts per metre (V/m).
(50 Hz electrical and magnetic fields. REE and UNESA, 1998).

Magnetic field:
At a given point, this is the force exerted on a unit of current. It is expressed in amperes per metre (A/m). The unit of measurement in the International System is the Tesla (T) or a fraction thereof. In particular the microtesla (mT).
(50 Hz electrical and magnetic fields. REE and UNESA, 1998).

Environmental impact declaration (EID):
A declaration by the relevant environmental authority which, with regard to foreseeable environmental effects, determines whether the planned activity should be carried out or not. If positive, it sets the conditions for appropriate protection of the environment and natural resources.
Royal Decree 1131 of September 30th 1988, approving supplementary legislation for application of R.D.L.1302 of June 28th 1986, on environmental impact assessment).

Decision on environmental assessment:
A decision by the relevant environmental authority which determines whether the planned substation should be submitted to the environmental impact assessment procedure.
(Own definition. REE).

Dissuasive device:
A device made of different pieces of galvanised steel of various sizes that impedes the construction of a nest and perching by birds at the point where it is installed or on the device itself.
(Own definition. REE).

Environmental impact study (EIS):
A technical document that should be presented by the designer of a project and the basis of the EID. This study should identify, describe and assess, in an appropriate fashion and taking into account the particular features of each case, the foreseeable and notable effects of the project on different environmental aspects.
(Royal Decree 1131 of September 30th 1988, approving supplementary legislation for application of R.D.L.1302 of June 28th 1986, on environmental impact assessment).

Environmental study (ES):
A summary of the environmental impact study for a substation project.
(Own definition. REE).

Environmental impact assessment (EIA):
A series of studies and technical systems that can estimate the effect of a given project, contract or activity on the environment.
(Royal Decree 1131 of September 30th 1988, approving supplementary legislation for application of R.D.L. 1302 of June 28th 1986, on environmental impact assessment).

Environmental assessment (EA):
An analysis of the environment study for a substation project.
(Own definition. REE).

Environmental goal:
A general-purpose environmental objective stemming from the environmental policy which an organisation sets itself. It is quantified as far as possible.
(Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme – EMAS).

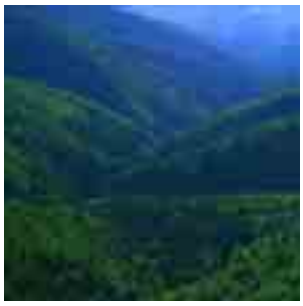
Environmental policy:
General objectives and principles of an organisation in regard to the environment, including compliance with all pertinent requirements and a commitment to improve environmental behaviour in a continuous fashion. The environmental policy is the framework for establishing and revising the environmental goals.
(Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme – EMAS).

Waste:
Any substance or object in any of the categories in the annex to the Waste Act being disposed of by its owner or whose owner has the intention or obligation to dispose of. In any event, items listed in the European waste catalogue will be included in this definition.
(The Waste Act – Law 10 – of April 21st 1998).

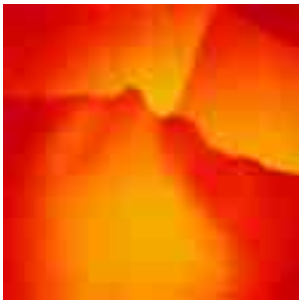
Dangerous waste:
Items in the dangerous waste list, approved by Royal Decree 952/1997, and containers and receptacles that have been used to hold them, those that have been classified as dangerous by EU standards and those defined by the government in accordance with the European legislation or in international agreements to which Spain is a party.
(The Waste Act – Law 10 – of April 21st 1998).

Birdsavers or birdsaver spirals
A white or orange polypropylene spiral in the form of a spindle, 30-35 cm in diameter and 100 cm in length. It is wrapped round the earth wire or conductor to act as a marker to prevent collisions involving birds.
(Own definition. REE).

Visual simulation:
Infographics (a computer-aided graphic simulation technique) used to obtain a picture of a project that provides a very approximate idea of its appearance after construction. It includes the component parts and their integration with the local surroundings.
(Own definition. REE).



Environment management system (SIGMA):
Part of the general management system that includes the organisation, planning, responsibilities, procedures, processes and resources to develop, apply, achieve, revise and maintain environmental policy.
(Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme – EMAS).



AENOR Asociación Española de Normalización y Certificación

ESQUEMA EUROPEO DE ECOGESTIÓN Y ECOAUDITORÍA
(EMAS)
Eco-Management and audit scheme (EMAS)

VDM-01/004

La Asociación Española de Normalización y Certificación (AENOR) a través de procesos de auditoría acreditados, certifica que:
The Spanish Association for Standarization and Certification (AENOR) through acreditated audit processes certifies that:

RED ELECTRICA DE ESPAÑA, S.A.

tiene implantado un sistema de Gestión Medioambiental que cumple los requisitos del Reglamento Europeo 761/2001
has implemented an environmental management system that complies with the requirements of the European Regulation 761/2001

para las actividades de:
for the activities of:

LA INGENIERÍA, LA CONSTRUCCIÓN Y EL MANTENIMIENTO DE LAS RED DE TRANSPORTE DE ENERGÍA ELÉCTRICA Y OPERACIÓN DEL SISTEMA ELÉCTRICO.

THE ACTIVITIES RELATED FOR THE DESIGN, CONSTRUCTION AND AINTENANCE OF POWER TRANSMISSION NETWORK AND THE OPERATION OF THE ELECTRIC POWER SYSTEM.

que se realizan en o desde los establecimientos:
which is/are carried out in or from the establishments:

Sede Social
PO CONDE DE LOS GAITANES, 177
28109 - ALCOBENDAS (MADRID)

Delegación Regional Sur
CL INCA GARCILASO, 1 EDIFICIO REE
41092-ISLA DE LA CARTUJA (SEVILLA)

Delegación Regional Noreste
AV PARALELO, 95 EDIFICIO REE
08004-BARCELONA

Delegación Regional Norte
AV DE ENEKURI, 60 EDIFICIO REE
48014-BILBAO (VIZCAYA)

Delegación Regional Oeste
CL ZALAETA, S/N EDIFICIO REE
15002-LA C CORUÑA

CECORE
CL ISAAC NEWTON, 13 EDIFICIO REE
28760-TRES CANTOS (MADRID)

Demarcación Bética (34 Subestaciones)
CR SEVILLA-UTRERA, Km 17
41500-ALCALÁ DE GUADAIRA (SEVILLA)

Demarcación Duero-Sil (39 Subestaciones)
CR N-601., MADRID-VALLADOLID-LEÓN, Km 210
47630-LA MUDARRA (VALLADOLID)

Demarcación Ebro (32 Subestaciones)
ZARAGOZA-SARIÑENA, Km 9.2
50161-VILLAMAYOR (ZARAGOZA)

Demarcación Mediterránea (22 Subestaciones)
CR ANTIGUA CASTELLBISBAL-RUBÍ, S/N PI CAN PI DE VILABOC
08191-RUBÍ (BARCELONA)

Demarcación Tajo (24 Subestaciones)
CR N-1 MADRID-BURGOS, Km 29,7
28700-SAN SEBASTIÁN DE LOS REYES (MADRID)

Almacén General
CR N-601 MADRID-VALLADOLID-LEÓN, Km 210
47630-LA MUDARRA (VALLADOLID)

Delegación Regional Levante
CL PUEBLA LARGA, 18
46183-LA ELIANA (VALENCIA)

LAS LÍNEAS CORRESPONDIENTES A LA RED DE TRANSPORTE

y que la información incluida en la declaración medioambiental se ajusta a los requisitos expresados en dicho Reglamento y ha sido validada con fecha 2004-05-06.
and the information included in the environmental declaration complies with the requirement of that European Regulation and has been validated on 2004-05-06.

Fecha de validación: 6 de mayo de 2004
Validation Date

AENOR Asociación Española de Normalización y Certificación

Firma: D. Ramón NAZ PAJARES
Signature **Director General de AENOR**
General Manager of AENOR

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