

ENERGY IN TUNE WITH YOU





Reduction of specific emissions

SO_2 -49%



Reduction of specific emissions

NO_x -19%



Reduction of specific emissions

Particulates -44%

The 2003 Environmental Report reviews the activities that Enel's Divisions and Companies – in their configuration as of 31 Dec. 2003 – carried out in Italy and abroad (Spain, Bulgaria, North and South America).

The data of each Division or Company refer to the entire year and include acquisitions, if any, made in the course of the year.

The reported data are equal to 100%, independently of Enel's holdings in the Companies.

By way of example:

- > Interpower, sold on 29 January 2003, is excluded;
- > the data of Deval, of which Enel has a 51% stake, are equal to 100%.

The Report, which has the typical format of annual reports, consists of the following sections:

- > Enel's organizational structure;
- > environmental policy;
- > environmental management organization;
- > environmental governance;
- > some facts about research, environment and quality;
- > environmental features and highlights of Enel's business activities (with data sheets summarizing their environmental performance);
- > eco-balance, consolidating the results of Enel's Companies and Divisions and including indicators and graphic presentations.

A special section is dedicated to initiatives and results in the area of occupational health & safety.

The verifier's statement closes the publication.

The data on international operations are limited, for this first year, to those appearing in the "International" chapter, "Business Activities" section.

The data on number and characteristics of installations as well as the organization of business activities over the country, etc. are reported as of 31 December.

For additional information
on the general contents of
the Environmental Report,
contact:

Marcello Coggiatti
Enel / Public and Regulatory
Affairs
Environmental Policies
Viale Regina Margherita, 137
00198 Roma
Tel. no. +39-068305.2755
marcello.coggiatti@enel.it

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CEO's Message



The task of generating electricity in more efficient ways, minimizing emissions and the environmental impact, is an integral part of our mission. The publication of the Environmental Report is an opportunity to measure our performance and take stock of our activities and achievements during the year.

2003 was the International Year of Research, a field where Enel had a particularly good performance, because we feel that innovation and research can help reconcile economic development with environmental sustainability and social accountability. Two of our projects – the use of debris from marble processing for desulfurizers and the elimination of the typical odor of geothermal plants – received the Innovation & Environment Award organized by Legambiente (environmental association) and the Bocconi and Politecnico di Milano universities. But during 2003, we also launched the Hydrogen Project as part of the Hydrogen Park Consortium of Venice, as well as the Archimedes Project, an initiative resulting from the cooperation between Enel and Enea (New Technologies, Energy and Environment Agency) for construction of a thermodynamic solar facility associated with the combined-cycle plant of Priolo Gargallo in Sicily. The facility will generate electricity from the high-temperature steam produced from solar heat.

This year, the Environmental Report is presented for the first time together with the Annual Report and the Sustainability Report. This initiative stresses that the three Reports are not separate objects but an integrated set of documents reflecting an economic, environmental and social reality which shares the same mission. An integrated reading of these documents demonstrates that excellent financial performance can be attained in parallel with improvements in the environmental and social management of our activities.

On the environmental front, Enel achieved all the targets that it had set. At the international level, we are among the companies with the best environmental performance. We continued to decrease the emissions of traditional pollutants from thermal power plants; with respect to 2002, sulfur dioxide (SO₂) dropped by 46%, nitrogen oxides (NO_x) were slashed by 12% and also particulates fell by 40%. The rationale behind these positive results lies in improvement and rebalancing of the fuel mix, as well as in enhanced efficiency of our thermal plants (from below 38% to over 39%).

The only legislative derogations, for emissions into the atmosphere and for the temperature of the releases of thermal power plant cooling waters, were requested upon the heat wave of the Summer of 2003, but only to avert the risk of an electricity generation deficit.

We recorded positive results also in terms of greenhouse gases (CO₂): average specific emissions from thermal generation were equal to 670 g/kWh, i.e. about 7% less than in 2002 and more than 9% less than in 1990. Furthermore, we went on with our programs for optimizing waste and water management.

Thanks to our efforts in the use of renewables, net generation from wind sources rose by 24 GWh with the entry into operation of new plants with a total capacity of 68 MW.

Another important aspect is the mitigation of the impact of our medium- and low-voltage power lines on land use and landscape: over 68% of the medium- and low-voltage grid uses underground or insulated overhead cables.

These results substantiate that the strategy of conversion of our plants to more efficient and less costly fuels – thanks to advanced flue gas abatement technologies – can drive down costs but also significantly curb emissions.

Efficiency, positive financial performance, care for the environment and landscape where we work can and should go hand in hand. This is our commitment and we will keep it also in the coming years.

The Chief Executive Officer

Paolo Scaroni

A handwritten signature in black ink, appearing to read 'Paolo Scaroni', written in a cursive style.

Enel SpA

The organizational structure of Enel, which took shape in the course of 2002, is organized into Divisions (Generation and Energy Management, Networks, Infrastructure and Sales, International, Telecommunications, Services and Other activities) to more adequately reflect Enel's strategic change from a multi-utility model to an organization focused on electricity and gas. In the new organization, which includes Terna (owner of the near totality of the national transmission grid), Enel SpA has a more significant role of guidance and monitoring.

Corporate

Generation and Energy Management Division	Networks, Infrastructure and Sales Divisions	
	Electricity	Gas
International Operations Division	Telecommunications Division	Services and Other activities Division
Transmission Networks		

Environmental policy

Enel has always showed environmental care in addressing aspects of electricity generation and distribution, efficient use of resources, abatement of emissions, operation of installations and their integration into the landscape. Environmental protection has thus become a corporate asset of strategic and societal relevance, which adds value to Enel's industrial policies.

Good environmental performance over the years led Enel to reiterate its environmental policy and underlying principles also in 2003 and to propose the achievement of the related targets with renewed impetus.

Principles

- > Protecting the environment and the health & safety of workers.
- > Safeguarding Enel's corporate value.
- > Raising environmental and product quality standards.

Strategic targets

- > Use of processes and technologies which prevent and/or mitigate impacts on the environment and landscape.
- > Rational and efficient use of energy resources and raw materials.
- > Optimization of waste recovery.
- > Application of international environmental and safety management systems in the various activities.
- > Optimized integration of installations into the landscape.
- > Use of the best operating practices.
- > Communication of corporate environmental performance to the public at large and to institutions.
- > Environmental awareness, education & training of employees.

Environmental management organization

Environmental Policies Unit of Enel's Corporate Public and Regulatory Affairs has the mission of identifying Enel's strategic environmental targets, ensuring their consistency with the Divisions' programs and initiatives.

In particular, the Unit:

- > promotes, implements and coordinates programs and agreements with environmental institutions and agencies;
- > identifies indicators and monitors the progress of corporate initiatives in terms of environmental impacts;
- > conducts analyses on specific environmental issues having particular repercussions on Enel's system and arousing public interest;
- > establishes relations with environment-focused institutions and agencies on technical matters;
- > prepares Enel's Environmental Report.

Furthermore, depending on the specific issues to be covered, each Business Division may have in-house environmental teams and/or specialists.

Enel's total human resources that are full- or part-time dedicated to environmental matters amount to over 220 equivalent full-time units.

Environmental governance

The new organizational structure strengthened Enel SpA's responsibilities, especially in terms of governance of cross-cutting processes, with a view to maximizing effectiveness and efficiency in the performance of business activities.

Environmental governance helps raise the social credibility of Enel and is a measure of the competitiveness and value of its policies vis-à-vis shareholders, customers and communities.

Enel's environmental governance is currently implemented via reporting, management, awareness, training & education instruments, which also serve the purpose of transferring it to regional units so as to ensure consistent actions and behaviors.

Effective environmental governance also means careful management of financial resources.

Although Enel has not yet a dedicated accounting system, its environmental expenses are recorded on a yearly basis in order to guide investments of an environmental nature.

Moreover, the governance process is designed in such a way as to address the inevitable environmental criticalities, which occasionally evolve into lawsuits.

Environmental reporting

The reporting system has become a key instrument for constantly monitoring the interactions of Enel's industrial activities with the environment.

The system was refined over the years, thanks to constant utilization and introduction of techniques and procedures that ensure data management reliability. Additionally, the formats for data collection were revised both for recording occupational health & safety items and for making the reporting system more flexible and more adaptable to Enel's new organizational configuration, as well as to evolving legislation.

Data reporting has become engrained into Enel's environmental management system and its methodology ensures the best homogeneity of the collected data.

Thanks to its high manageability, the reporting system has become an instrument for periodical monitoring the environmental performance of many of Enel's business activities vs. targets.

Environmental management

In 2003, once again, Enel was engaged in the application of environmental management systems in its electricity generating sites, in accordance with the international ISO 14001 standard and with the EMAS (Eco-Management and Audit Scheme) Regulation.

In particular, Enel is committed to certifying all of its Italian power plants under ISO 14001 and to subsequently apply for EMAS registration of at least 90% of them.

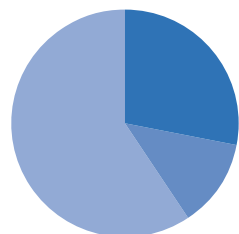
As of December 31, 2003, 51% of Enel's installed capacity (58 power plants) was certified under ISO 14001; 27% of such capacity also obtained the EMAS registration.

The ISO 14001-certified sites which have already been EMAS-registered are the thermal power plants

of Fusina, La Casella, Leri Cavour, Montalto di Castro, Porto Marghera, Sulcis and Torrevadalis Nord, the hydro power area of Vomano and the hydro operation units of Avisio and Cordevole. The thermal power plants of Porto Tolle, Priolo Gargallo, Brindisi Sud and La Spezia, the hydro business unit of Bologna, the hydro power plant of Entracque, the hydro power area of Taloro and the hydro operation unit of Nove are only ISO 14001-certified, but are already preparing for EMAS registration.

EMAS in power plants

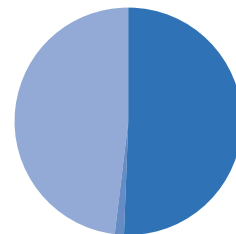
With reference to overall capacity: 41,846 MW



■ Registered **26.8%**
 ■ Registration under way **12.8%**
 ■ Planned registration **60.4%**

ISO 14001 in power plants

With reference to overall capacity: 41,846 MW



■ Certified **51.1%**
 ■ Certification under way **0.3%**
 ■ Planned certification **48.6%**

Furthermore, the Power Grid Business Unit of the Networks and Infrastructure Division is awaiting the ISO 14001 certification.

Terna actively participated in the drafting of guidelines for environmental management of high-voltage power lines. The guidelines were issued by APAT (National Agency for Environmental Protection and Technical Services).

In November 2003, the Telecommunications Division (Wind) obtained the three-year renewal of its ISO 14001 certification.

Awareness, training & education

Environmental awareness, training & education initiatives have become core elements of Enel's yearly education plan for improving the skills and know-how of human resources.

In 2003, Enel developed 55 education modules for its environment-dedicated personnel, delivering a total of about 10,000 man-hours of courses.

Also in 2003, Enel relied on communication activities for disseminating knowledge of its initiatives internally and externally.

Brilliant communication results were achieved, among others, through two thematic sections of Enel's portal, the "Environment Channel" (www.enel.it/ambiente) and the "Nature Channel" (www.enel.it/natura), which have been active for almost three years and which are intended to build public awareness of the relations between industrial settlements, the environment, nature and landscape.

Web users highly appreciated the contents posted on the two channels. In 2003, the channels had an average of about 6,300 first-time visitors per month, corresponding to about 21,500 accesses per month, with average sessions of about 20 minutes each.

To intensify its communication with the external world on specific themes of environmental protection and nature conservation, Enel activated an online forum (www.enel.it/it/enel/portale/forum) and a dedicated mailbox (ambiente@enel.it).

Moreover, in its "Nature Channel", Enel posted a "Travel Notes" section, as well as a multi-media section with atlases of Italian birds, mammals and orchids. A new navigable version of "Electricscapes" and "Visit the Power Plants" is also available.

Financial resources

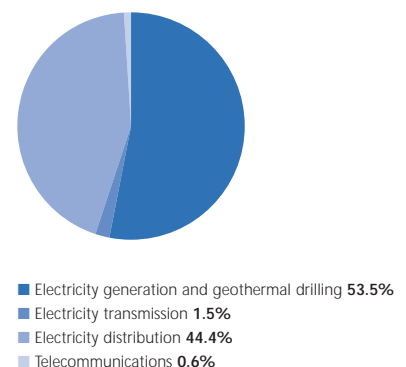
In 2003, sizeable financial resources were allocated to environmental protection:

- > 131 million euro of investments;
- > 637 million euro of current expenditure.

The near totality of the above figures refer to electric activities.

In line with the guiding principles of Enel's previous environmental reports, environmental expenditure is defined as the costs incurred for protection of the external environment and of the health of the general population. This expenditure excludes the costs incurred for activities that, albeit beneficial to the environment, are carried out mainly for industrial and economic purposes, for protection of workers and for the safety and security of power installations.

Environmental investments
by business activity
Total: 130.8 million euro



Among the most significant environmental investments, it is worth mentioning those for fluidized-bed conversion of unit 2 of the Sulcis power plant; the unit is scheduled to go into service by the end of 2004. Improvements were also made to emission abatement systems in the Livorno and Genova power plants.

In the first months of 2004, the first of the two Termini Imerese units became operational, thus completing the first step of the program (2002-2006) of conversions of the power plants of La Casella, Priolo Gargallo, Porto Corsini and Pietrafitta to combined cycles. Although this investment is not based on environmental considerations, it increases the efficiency of thermal generation.

In 2003, more vigorous initiatives were taken to eliminate the impact of prior geothermal activities on landscape, by implementing most of the projects included in the 2001-2006 plan of environmental rehabilitation of geothermal areas.

The most significant environmental investments were made in the following areas:

- > power grid: in the range of 60 million euro;
- > thermal power plants: in the range of 59 million euro;
- > geothermal plants: in the range of 8 million euro.

The current environmental expenditure for 2003 includes:

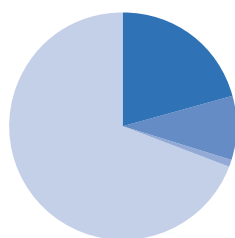
- > costs for the operation of equipment and systems for environmental protection, for waste disposal and for the personnel involved of Enel and contractors: about 132 million euro;
- > eco-taxes, the most significant of which were the eco-tax on SO₂ and NO_x emissions, the carbon tax on fossil fuels and the levy on geothermal power plants: about 58 million euro.

It is worth stressing:

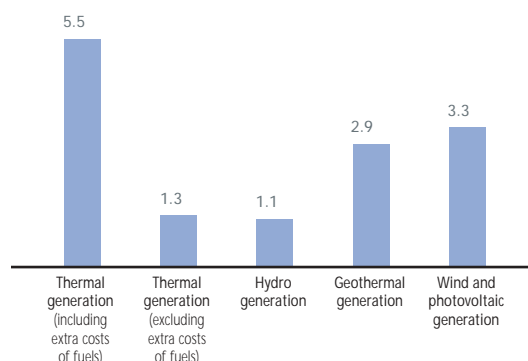
- > the captive use – for environmental compliance – of low-sulfur fuels, especially natural gas in steam generators and medium-, low- very low-sulfur fuel oil, in place of the originally planned fuel;
- > the partial or total unavailability of power installations for environmental requirements, such as reduction of the power of some plants in order to satisfy the temperature limits of cooling water releases.

In 2003, the corresponding costs were in the range of 450 million euro.

Items of current environmental expenditure
Total: 637.3 million euro



Current environmental expenditure per kWh generated
By type of generation (thousandths of euro/kWh net)



Environmental criticalities

The use of the most rigorous and advanced organizational measures cannot avoid the occurrence of environmental criticalities, which originate from various factors, including the excessive emphasis that the media place on some issues, thus inducing a wrong perception of reality and improper expectations among communities.

Environmental criticality is the rejection of or opposition to installations (and/or to the impact deriving from their operation). Such rejection or opposition is expressed – obviously for environmental reasons – by a third party feeling disturbed, damaged or threatened by present or future installations. Environmental opposition translates into initiatives which include legal notices (including written protests) or administrative measures and which may involve significant costs owing to failed authorizations, suspension of works, modifications of installations, etc.

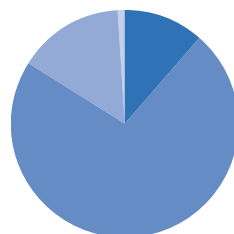
73% of environmental criticalities involve the power distribution grid, 15% telecommunications, 11% electricity generation and geothermal drilling and the remaining 1% other activities. The most frequent criticalities concern electric & magnetic fields (over 56%), biodiversity and landscape, noise and vibrations.

The criticalities concerning air and climate, waste, soil, groundwater and surface water only relate to electricity generation and geothermal drilling. "Other" criticalities (those which do not fall under the above-mentioned headings) mainly involve the power distribution grid.

76% of the criticalities arose from complaints, while the remaining part was due to administrative measures and legal notices.

Environmental criticalities
by business activity

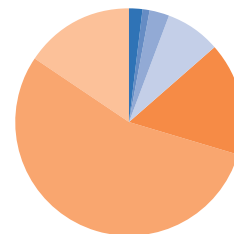
Total: 219



■ Electricity generation and geothermal drilling **11.4%**
■ Electricity distribution **73.1%**
■ Telecommunications **15.0%**
■ Other installations **0.5%**

Environmental criticalities
by environmental protection activity

Total: 219



■ Air and climate **1.4%**
■ Waste **0.5%**
■ Soil, groundwater and surface waters **2.3%**
■ Noise and vibrations **7.8%**
■ Biodiversity and landscape **16.0%**
■ Radiation (including electromagnetic fields) **56.5%**
■ Other **15.5%**

Environmental litigation

As of December 31, 2003, Enel had 555 pending lawsuits, of which 52% administrative, 33% civil and 15% criminal.

The distribution of lawsuits by business activity and by environmental protection activity is practically the same as the one of environmental criticalities.

It is worth mentioning that, in 2003, 66 new lawsuits were filed, whereas a higher number of lawsuits (91) were settled. In 80% of the cases, the judgment was in favor of Enel.

Some facts about research, environment and quality

Electricity evolution: from fossil fuels to hydrogen

Enel is very attentive to capturing the opportunities arising from hydrogen research. Numerous initiatives were taken in 2003 to apply well-established technologies and test emerging concepts for production of hydrogen and its use in transportation as well as in electricity and heat generation. The following are the most significant activities that the Generation and Energy Management Division carried out in this field.

- > Launch of an integrated project for developing and testing technologies of production of hydrogen from coal, as well as for developing an advanced hydrogen-fueled thermal cycle, also in view of Enel's participation in the Hydrogen Park Consortium of Venice (formalized at the beginning of 2004).
The plants involved in the project are located near the coal-fired plant of Fusina.
- > Construction of an experimental station, consisting of a combined heat & power generation system based on Proton Exchange Membrane (PEM) fuel cells, for testing innovative concepts in distributed generation. In 2003, the system (5 MW capacity) operated for 1,000 hours under different load conditions, generating electricity and heat.
- > Completion of an international demonstration project for testing a hybrid-cycle facility integrating Solid Oxide Fuel Cells (SOFCs) with gas turbines. Partners in the project, coordinated by the German electricity company RWE, were the German gas company (Thyssen Gas) and Siemens Westinghouse, which provided the technology.

The new frontier of renewable-energy plants: "Archimedes Project"

In 2003, an important agreement between Enea (New Technologies, Energy and Environment Agency) and Enel opened the way to the testing of power plants associating combined cycles with solar concentration systems consisting of linear parabolic collectors.

The new technology will be applied on the industrial scale at Enel's plant of Priolo Gargallo (Sicilia), recently converted to two combined-cycle gas-turbine units, each with a capacity of 380 MW.

The plant site has about 60 hectares of flat vacant land, which will be used as solar field.

The collectors will be aligned along the North-South axis and arrayed in parallel rows with a spacing of about 12 meters. 306 100 m-long and 108 50-m long collectors will cover an area of about 40 hectares, providing a total active area of nearly 20 hectares.

The about 20-MW solar facility, which will integrate the Priolo plant, is based on an innovative technology developed by Enea: its mirrors will absorb the available solar radiation to produce steam, which will be fed to the plant turbines; this steam, combined with the steam produced by the combined-cycle heat recovery steam generators, will increase the total generation of electricity, fuel consumption remaining equal.

In particular, Enea's research innovated the solar absorption system, whose linear parabolic mirrors concentrate solar radiation and reflect it onto a receiving tube, specially designed to withstand

operating temperatures (550°C). Inside the tube, there is a heat transfer fluid consisting of a mix of molten salts.

The plant will generate more than 60 GWh of electricity per year, saving almost 13,000 tons of oil-equivalent and avoiding over 40,000 tons of CO₂ emissions into the atmosphere.

The planned investment is equal to roughly 50 million euro.

Energy Quality: the Environmental Product Declaration

In 2003, Enel joined the Intend project, within the framework of the European LIFE Environment program. The project is targeted to apply the Environmental Product Declaration (EPD - highly developed in North-European countries, especially in Sweden) in Italy on an experimental basis. The EPD is a voluntary certification (under the ISO/TR 14025 standard) which provides information on the environmental performance of a product or service through the application of the Life Cycle Assessment (LCA) methodology. Similarly to an eco-label, the EPD informs consumers about the environmental impact of a product or service.

This certification is not alternative but complementary to environmental management schemes or systems, such as EMAS or ISO 14001.

Enel's interest in the EPD scheme arises from the need to offer more and more transparency to its customers in terms of the impact of the entire cycle of generation of electricity which, in this case, is regarded as a "commodity". Thus, in 2003, as part of the Intend project, Enel started the process for obtaining the Environmental Product Declaration in respect of the electricity generated by two of its renewable-energy power plants: the wind plant of Sclafani Bagni (8.5 MW) in the province of Palermo and one geothermal plant still to be identified. The certification is expected to be obtained by the end of 2004.

Enel will thus be the first Italian company to engage in the EPD.



Business Activities

Generation and Energy Management

The Generation and Energy Management Division is one of the six areas of Enel's new organization. The Division gathers all assets of electricity generation in Italy and, through Enel Trade, of electricity sales in the Italian market to customers with a yearly consumption of over 100 million kWh and to resellers.

Always through Enel Trade, the Division sells natural gas to distributors and is active in trading on international markets.

Fuel handling services are provided through Enel Logistica Combustibili.

Electricity generation assets abroad (Spain, North America, Latin America, Bulgaria) were transferred to the recently established International Division.

The Generation and Energy Management Business Units which are involved in electricity generation from conventional sources (fuel oil, natural gas, coal, orimulsion) and from renewables are:

- > "Thermal Generation", which manages thermal power plants;
- > "Renewables", which develops and operates renewable-energy plants.

The Generation and Energy Management Division is implementing programs which have a positive impact on the environment: rationalization of the use of energy resources, development of renewables, increased efficiency of power plants and reduction of CO₂.

The new power plant of Torrevaldaliga Nord (Civitavecchia)

In December 2003, Enel obtained the authorization for converting its Torrevaldaliga Nord power plant from oil- to coal-firing. The plant will have a capacity of about 2,000 MW. It is one of the most ambitious and advanced projects of the kind at the international level. The project features highly innovative technological applications, such as coal handling and storage in a closed-loop and vacuum system, which prevents the dispersion of particulates. Furthermore, with high-efficiency fabric filters, as well as last-generation desulfurizers and denitrification systems, the emissions into the atmosphere from the plant will be kept at about 60-70% of the levels indicated in the new national and EC regulations (maximum allowed stack concentrations: 100 mg/Nm³ for nitrogen and sulfur oxides and 15 mg/Nm³ for particulates).

The solution chosen for boilers will result into a plant efficiency of 45% as against 35-38% of other coal-fired plants. CO₂ emissions will thus be extremely limited.

The construction of the plant, to be completed in 2008, will require an investment of about 1.5 billion euro.

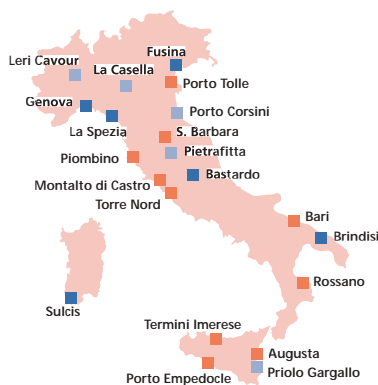
New renewable-energy power plants

In 2003, renewables had a further development, especially as a result of the entry into operation of new wind farms:

- > Campolieto, province of Campobasso (2.5 MW);
- > Sclafani Bagni, province of Palermo (8.5 MW);
- > Serra Cortina, municipality of Colobraro, province of Matera (2.5 MW);
- > Contrada Corvo, municipality of Caltavuturo, province of Palermo (30.6 MW);
- > Sa Turrina Manna, municipality of Tula, province of Sassari (23.8 MW).

The total new installed capacity (68 MW) will generate about 24 GWh per year.

Thermal Generation



Business unit

- Generation from coal and orimulsion
- Generation from fuel oil and gas
- Generation from combined cycles and gas turbines

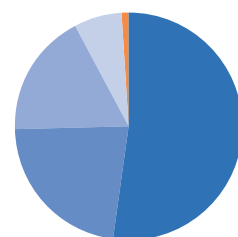
For additional information, contact:
 Maurizio Urbani
 Enel / Generazione ed Energy Management
 Viale Regina Margherita, 125
 00198 Roma
 Tel. no. +39-068305.4445
maurizio.urbani@enel.it

Thermal power installations

	Power plants no.	Generating units no.	Net maximum capacity MW
Steam (condensing)		57	14,178
Repowered with gas turbines		10	5,997
Combined-cycle gas turbines		13	4,711
Gas turbines		27	1,810
Diesel		43	24
	45	150	26,719

Net maximum capacity

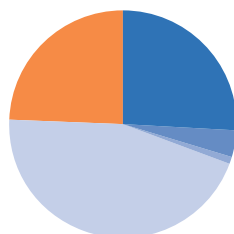
Total: 26,719 MW



- Steam **53.1%**
- Repowered with gas turbines **22.4%**
- Combined-cycle gas turbines **17.6%**
- Gas turbines **6.8%**
- Diesel **0.1%**

Net fossil-fired thermal generation

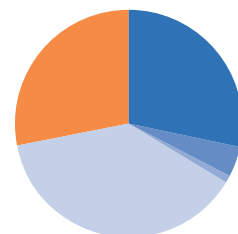
Total: 106,670 million kWh



- Fuel oil **25.9%**
- Orimulsion **3.8%**
- Gas-oil **0.2%**
- Natural gas **45.7%**
- Coal **24.4%**

Fuel consumption

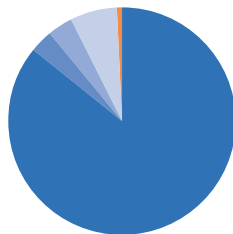
Total: 23,294,273 t of oil-equivalent



- Fuel oil **27.7%**
- Orimulsion **4.2%**
- Gas-oil **0.4%**
- Natural gas **40.3%**
- Coal **27.4%**

Expendables

Total: 297,267 t

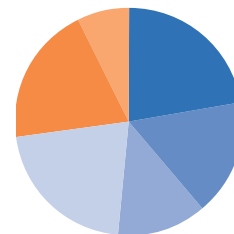


- Limestone for flue gas desulfurization **85.7%**
- Caustic soda, sulfuric & hydrochloric acids **3.2%**
- Resins, hydrazine, carbohydrazide, lime, sodium hypochlorite & chlorine dioxide **3.6%**
- Ammonia **6.7%**
- Other **0.8%**

Water for industrial uses

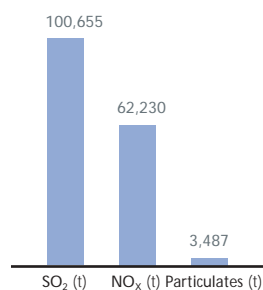
Total requirements: 43,372,381 m³

Total abstraction from inland waters: 22,340,346 m³



- From rivers **22.3%**
- From wells **16.5%**
- From aqueducts **12.7%**
- From the sea (as-is) **21.3%**
- From the sea (desalinated) **19.8%**
- From waste waters (used inside plants) **7.4%**

Emissions into the atmosphere



CO ₂ (t)	71,457,170
> from combustion	71,345,045
> from desulfurization	112,125

SF ₆ (kg)	637
(t of CO ₂ -equivalent)	15,212

Total (t of CO₂-equivalent) 71,472,382

Waste waters

Discharged into water bodies (m³) 12,576,493

Used inside plants (m³) 3,200,279

Waste waters include those meteoric waters that are susceptible to pollution and are therefore fed to treatment systems before being discharged or used.

Special Waste

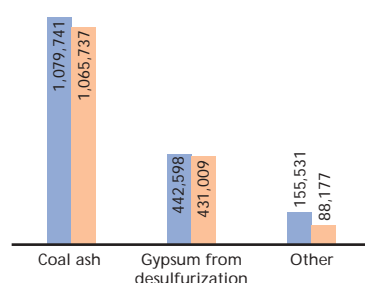
Total production: 1,699,641 t

Total delivery to recovery operators: 1,586,406 t

Non-hazardous

Total production: 1,677,869 t

Total delivery to recovery operators: 1,584,923 t

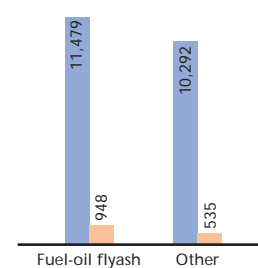


■ Production ■ Delivery to recovery operators

Hazardous

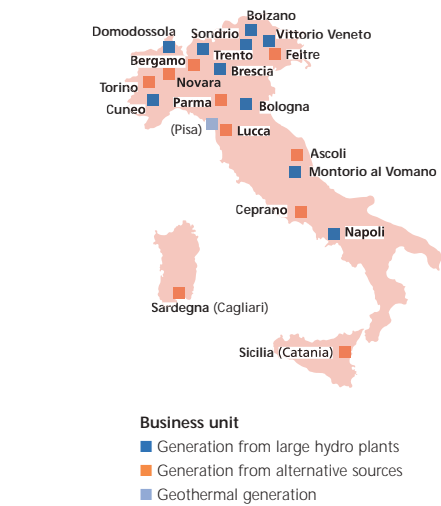
Total production: 21,771 t

Total delivery to recovery operators: 1,483 t



■ Production ■ Delivery to recovery operators

Renewables



For additional information, contact:
Maurizio Urbani
Enel / Generazione ed Energy Management
Viale Regina Margherita, 125
00198 Roma
Tel. no. +39-068305.4445
maurizio.urbani@enel.it

Power installations

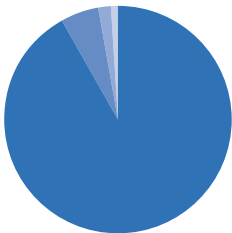
HYDRO	Power plants no.	Head installations no.	Net maximum capacity MW
Run-of-river		317	1,639.0
Pondage/reservoir		192	5,180.5
Pure/mixed pumped storage		20	7,510.6
	495	529	14,330.1

WIND	Power plants no.	Net maximum capacity MW
	14	127.7

GEO THERMAL	Power plants no.	Generating units no.	Net maximum capacity MW
Condensing		36	659.6
Atmospheric exhaust		1	5.9
	34	37	665.5

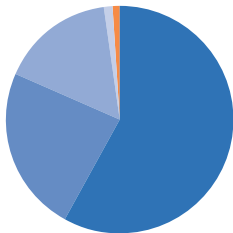
PHOTOVOLTAIC	Power plants no.	Net maximum capacity MW
	5	3.6

Net maximum capacity
Total: 15,127 MW



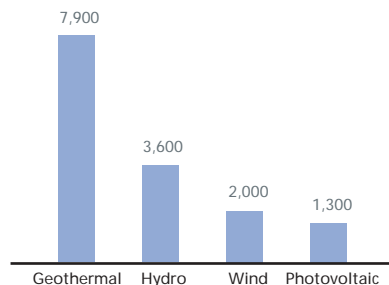
■ Hydro 94.74%
■ Geothermal 4.40%
■ Wind 0.84%
■ Photovoltaic 0.02%

Net electricity generation
Total: 31,124 million kWh



■ Hydro from natural flows 60.01% (18,679 GWh)
■ Hydro from pumped storage 23.56% (7,333 GWh)
■ Geothermal 16.18% (5,036 GWh)
■ Wind 0.24% (75 GWh)
■ Photovoltaic 0.01% (2 GWh)

Yearly equivalent hours of utilization*



* On a statistical basis: yearly energy capability/capacity ratio

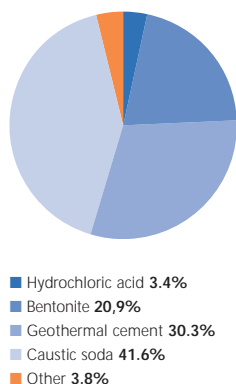
Geothermal fluid

Total fluid extracted (t)	41,591,440
Net of reinjected fluids (t)	28,627,040
Steam for electricity generation (t)	41,372,120
Fluid for non-electric uses (t)	819,620
> <i>used directly</i>	219,320
> <i>used after expansion in atmospheric-exhaust turbine</i>	600,300

Non-electric uses are uses of resources that do not have or have lost the thermodynamic properties making them suitable for geothermal generation. These uses fall under two main categories: supply of heat (especially for greenhousing and district heating) and extraction of substances (e.g.: carbon dioxide for foodstuffs).

Expendables (geothermal activities)

Total: 8,869 t



Water for industrial uses (geothermal activities)

Abstraction from inland waters, entirely from rivers (m ³)	1,100
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Gas-oil (geothermal activities)

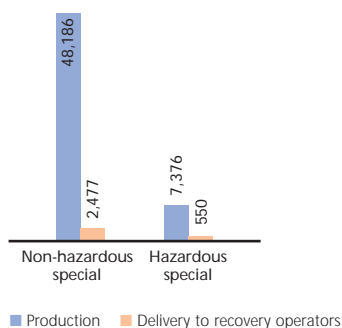
Total consumption (toe)	1,800
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Used for driving the drilling equipment.

Special waste

Total production: 50,663 t

Total delivery to recovery operators: 7,926 t



Emissions into the atmosphere

H ₂ S - geothermal generation (t)	24,388
CO ₂ - geothermal drilling (t)	5,527
SF ₆ - all types of generation (kg)	793
(t of CO ₂ -equivalent)	18,955

Carbon dioxide is produced by the combustion of gas-oil, which is used for driving the drilling equipment.

Avoided CO₂ emissions (t)

Hydro generation from natural flows (t)	12,513,000
Geothermal generation (t)	3,373,000
Wind generation (t)	50,000
Photovoltaic generation (t)	1,000
Total (t)	15,937,000

Avoided CO₂ emissions from the otherwise necessary conventional thermal generation.

Other data

HYDRO GENERATION

Desilted reservoirs	quantity (no.)	23
	alluvial sediments removed and reused locally (t)	141,300
Fish ladders (no.)		30
Fish restocking campaigns	quantity (no.)	133
	restocked fish individuals	3,081,000
	in addition to kg	6,600

GEOHERMAL ACTIVITIES

Drilled wells	new (no.)	2
	deepened (no.)	1
	rehabilitated (no.)	3
Meters drilled (m)	11,856	
In-service wells	for steam production (no.)	221
	for reinjection (no.)	28

WIND & PHOTOVOLTAIC GENERATION

Wind systems	surface area occupied by machines, buildings and roads (ha)	100
	total surface area affected by the installations (ha)	30 to 100 times larger
Photovoltaic systems	surface area occupied by modules (ha)	6.7
	total surface area affected by the installations (ha)	10.0

Networks, Infrastructure and Sales

In Enel's new organizational model, the assets and know-how of the electricity and gas grids were placed under the responsibility of two Divisions – the Sales Division and the Networks and Infrastructure Division – and the coordination of commercial activities was strengthened.

In particular, the Sales Division has the mission of developing an integrated offering of electricity and gas products and services, to be provided via focused distribution channels. The Division sells electricity and gas in the eligible and captive market, provides public and artistic lighting and is generally active in demand-side management.

The Networks and Infrastructure Division, instead, has the task of managing electricity and gas grids. Deval SpA, of which Enel SpA has a 51% stake, distributes electricity in the region of Valle d'Aosta.

Adoption of the Environmental Management System

In 2003, the Networks and Infrastructure Division, Power Grid Business Unit fine-tuned its Environmental Management System organization and procedures to conform to the international ISO 14001 standard.

The Environmental Management System documentation (Handbook, Procedures and Instructions) was finalized and the tender for certification of the System – expected by the end of 2004 – was awarded to the selected certifying body.

Always in 2003, the development of a corporate intra-network software system (called “Environment and Safety”) was completed. The system is intended to collect process data (waste, PCBs, SF₆, etc.) and process them, as well as to internally circulate the documentation of the Safety Management System and of the Environmental Management System. A section of the system, called “Legislative Observatory”, enables users to identify the applicable legislation and regulations and improve their understanding of specific topics by accessing appropriate summaries.

End-use energy efficiency

On October 8, 2003, the Authority for Electricity and Gas issued Decision no. 103: Guidelines for preparation, implementation and evaluation of the projects referred to in art. 5, para. 1, of the Ministerial Decrees of April 24, 2001, and for the definition of criteria, terms and conditions for the issuing of energy efficiency certificates.

The Decision gave impetus to a host of activities in the area of end-use energy efficiency (micro-plants, combined heat & power, photovoltaic and solar thermal plants) and of promotional initiatives (through Enel's Captive Customers Commercial Business Unit). Moreover, in the course of 2003, Enel launched a research project for quantifying energy savings from innovative concepts and planned related promotion and awareness actions.

Electric and magnetic fields: survey of power lines

The recently-approved implementing decrees of frame-law 36/2001 on electric and magnetic fields specified limits of exposure, attention thresholds and quality targets for power lines and mobile-telephony, radio and television stations.

Enel started a survey of power lines to identify critical conditions, if any, in terms of attention thresholds.

Power grid



■ Regional unit and headquarters location

For additional information, contact:
Anna Brogi
Enel / Infrastrutture e Reti
Via Ombrone, 2
00198 Roma
Tel. no. +39-068305.8021
anna.brogi@enel.it

Power installations

SUBSTATIONS	Installed transforming capacity	
	no.	MVA
HV/MV	1,983	87,532
Satellite substations and MV units	477	-
MV/LV	345,388	65,688
MV/MV	62,453	1,197
	410,301	154,237

LINES (km)	Overhead			Under-ground cables	Total
	bare conductors	Overhead cables			
HV (>40 kV)	18,905	-	374	19,279	
MV (1-30 kV)	205,740	7,159	120,295	333,194	
LV (380 V)	127,801	377,181	220,753	725,735	
	352,446	384,339	341,422	1,078,208	

General data

Regional units (no.)	11
Operation centers (no.)	29
Zones (no.)	129
Municipalities served (no.)	7,942
Customers connected to the divisional grid (no.)	29,484,870
> supplied by the Division	29,413,669
> only using its wheeling service	41,201

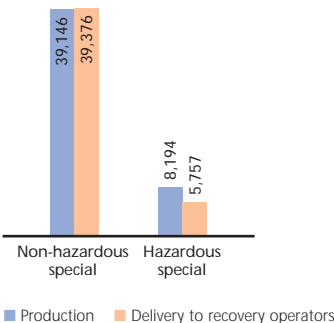
The Power Grid Business Area also operates 199 isolated photovoltaic systems. With a net maximum capacity of 589 kW and a yearly energy capability of about 648,000 kWh, they offer a cost-effective and environmentally sustainable solution for supplying power to mountain huts, nature sanctuaries and small isolated consumers.

Electricity

Total electricity distributed (million kWh)	243,520
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Special waste

Total production: 47,340 t
Total delivery to recovery operators: 45,133 t



Emissions into the atmosphere

SF ₆ (kg) (t of CO ₂ -equivalent)	2,010 48,039
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Deval



For additional information, contact:
Andrea Motta
Deval SpA
Via Clavalité, 8
11100 Aosta
Tel. no. +39-0165647350
andrea.motta@enel.it

Power installations

SUBSTATIONS	Installed transforming capacity	
	no.	MVA
HV/MV	13	372
Satellite substations and MV units	4	22
MV/LV	1,318	235
MV/MV	203	30
	1,538	659

LINES (km)

	Overhead bare conductors	Overhead cables	Under-ground cables	Total
HV (>40 kV)	57	-	0	57
MV (1-30 kV)	819	42	492	1,352
LV (380 V)	10	1,843	898	2,751
	885	1,885	1,390	4,159

General data

Municipalities served (no.)	68
Surface area served (km²)	3,132
Customers connected to Deval's grid (no.)	118,239
> supplied by Deval	118,005
> only using its wheeling service	234

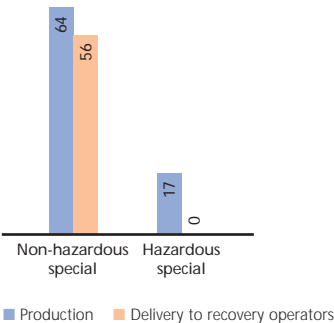
Deval also operates 2 isolated photovoltaic systems, which feed as many agricultural customers (in middle-mountain areas), each with a subscribed demand of 1.5 kW.

Electricity

Total electricity distributed (million kWh)	905
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Special waste

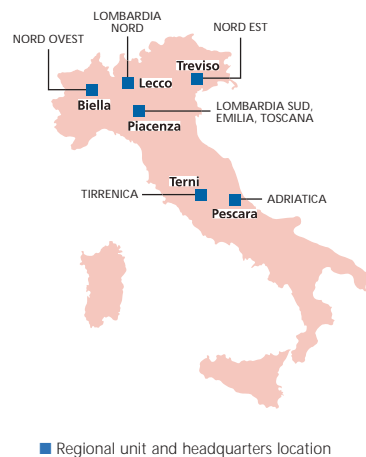
Total production: 81 t
Total delivery to recovery operators: 56 t



Emissions into the atmosphere

SF ₆ (kg t of CO ₂ -equivalent)	23 545
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Gas grid



For additional information, contact:
Gabriele Paris
Enel / Infrastrutture e Reti
Via Ripamonti, 85
20141 Milano
Tel. no. +39-0257471.478
gabriele.paris@enel.it

Installations

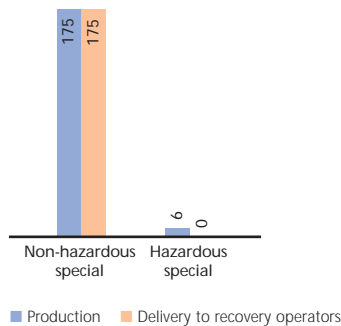
STATIONS (no.)	
HP/MP	528
MP/LP with a power of > 1,200 kW	8,699
	9,227
PIPELINES (km)	
HP (p > 5 bar)	123
MP (0.04 bar < p ≤ 5 bar)	10,566
LP (p ≤ 0.04 bar)	16,505
	27,194

General data

Municipalities served (no.)	1,051
Surface area served (km ²)	30,066
Customers connected to the grid (no.)	1,795,919

Special waste

Total production: 181 t
Total delivery to recovery operators: 175 t



Natural gas

Total natural gas distributed (million m ³)	3,493
Own consumption (million m ³)	5.8
Losses along the grid (million m ³)	12.2

Own consumption is the use of natural gas for its heating: before being distributed to customers, natural gas is heated in order to prevent it from freezing upon depressurization.
The gas is heated through an intermediate water circuit.

Resource consumption

Electricity (kWh)	3,130,000
Used for cathode protection of pipelines, for powering gas-heating circuit water pumps and for lighting of installations.	

Emissions into the atmosphere

CH ₄ (t) (t of CO ₂ -equivalent)	6,307 132,437
CO ₂ (t)	11,095

The emissions of methane are the share of this gas which is present in the natural gas lost along the grid.
The emissions of carbon dioxide are produced by the combustion of natural gas used for own consumption.

International

In 2003, Enel created its International Division with the mission of conducting international operations in the areas of electricity generation, as well as electricity and gas distribution and sales. The Division is also in charge of business development, i.e. of the search for alliances and acquisitions abroad in line with Enel's strategies.

Enel's international portfolio includes the following companies:

- > Viesgo Generación and Enel Unión Fenosa Renovables (EUFR), operating in Spain;
- > Maritza, in Bulgaria;
- > Enel North America (ENA), in North America;
- > Enel Latin America (ELA), in Central and South America;
- > Electra de Viesgo Distribución and Viesgo Energía, in Spain.

Enel's investments in international operations respond to strictly industrial strategies and involve programs of modernization and environmental improvements for compliance with international emission standards.

The 2003 Environmental Report provides, for the first time, the main data on the number, characteristics, operation and environmental impact of Enel's power plants abroad.

Generating mix

	Viesgo Generación		Enel Unión Fenosa Renovables		Maritza		Enel North America		Enel Latin America		Total International Division	
	Net maximum capacity (MW)	Power plants (no.)	Net maximum capacity (MW)	Power plants (no.)	Net maximum capacity (MW)	Power plants (no.)	Net maximum capacity (MW)	Power plants (no.)	Net maximum capacity (MW)	Power plants (no.)	Net maximum capacity (MW)	Power plants (no.)
Thermal	1,592	6	62	9 ⁽¹⁾	732	1	25	2 ⁽²⁾			2,411	18
Hydro	669	12	69	33			233	60	175	6	1,146	111
Wind			250	18			67	27	24	1	341	46
Total	2,261	18	381	60	732	1	325	89	199	7	3,898	175

(1) Combined heat & power

(2) 1 biomass, 1 biogas

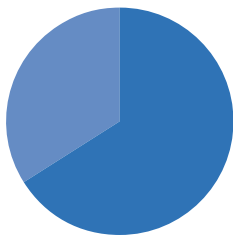
Net electricity generation

Million kWh

	Viesgo Generación	Enel Unión Fenosa Renovables	Maritza	Enel North America	Enel Latin America	Total International Division
Thermal from fossil fuels	4,676	359	2,751	0	0	7,786
<i>Coal</i>	3,934					3,934
<i>Brown coal</i>			2,751			2,751
<i>Fuel oil and natural gas</i>	742	359				1,101
Total from renewables	1,211	717	0	1,301	779	4,007
<i>Thermal from biomass and biogas</i>				175		175
<i>Hydro from natural flows</i>	1,211	234		952	719	3,115
<i>Wind</i>		483		175	60	718
Total	5,886	1,076	2,751	1,301	779	11,793

Net electricity generation by source

Total: 11,793 million kWh



■ Thermal from fossil fuels **66.0%**
■ Total from renewables **34.0%**

Emissions into the atmosphere from thermal power plants

Thousand tons

	Viesgo Generación	Enel Unión Fenosa Renovables	Maritza	Total International Division
SO ₂	54	n.a.	172	n.a.
NO _x	11	n.a.	3	n.a.
Particulates	4	n.a.	4	n.a.
CO ₂	4,944	81	3,322	8,347

By generating electricity from renewables, the International Operations Division avoided about 4.3 million tons of CO₂ emissions into the atmosphere from the otherwise necessary thermal generation.

Telecommunications

The new Telecommunications Division is featured by Wind, the company providing fixed & mobile telephony, as well as Internet services in an integrated way.

The take-over of Infostrada enabled Wind to operate fixed-telephony services more effectively. Wind provides Internet services through "Libero", which has become Italy's top-ranking Internet portal in terms of pages visited and market penetration.

Among the new Italian telecoms operators, Wind is the one with the largest fiber-optic transmission network.

Constant commitment to the environment

In 2003, Wind renewed its commitment to environmental protection, safety and social accountability. Wind plans to start a process which will lead it to become, during 2004, the first telecoms operator in the world with certified management systems in the above three areas.

In addition to the already achieved ISO 14001 and OHSAS 18001 certifications, Wind initiated the process of ethical certification under the international SA 8000 standard. With regard to environmental protection, Wind developed a network for monitoring the electromagnetic fields emitted by its installations. Through this network, Wind can constantly control the contribution of its aerials to population exposure to electric and magnetic fields. Finally, Wind is preparing Memoranda of Understanding with Regional Environmental Agencies in the main Italian regions in order to provide them access to the technical documentation of its installations, thus giving evidence of its well-established policy of transparency.

In 2003, Wind:

- > developed a system for monitoring and thus minimizing the energy consumption of its installations;
- > started a plan of replacement of all of its liquid-acid batteries with gel batteries, thereby eliminating the risk of leakage and soil contamination; to date, about 90% of its in-service batteries have been replaced;
- > prepared a project for computerized central management of incoming and outgoing waste records, in order to keep track of waste production and optimize waste reuse, recycling and recovery; the contractors managing and handling stocks and disused installations for Wind are involved in the project.



For additional information, contact:

Guido Morisco
Via G. Casalinuovo, 8
00142 Roma
Tel. no. +39-066464.5354
Guido.Morisco@mail.wind.it

Installations

Fiber-optic networks (km)	18,200
Local loops (km)	2,000
Fixed telephony switches (no.)	63
Mobile telephony switches (no.)	50
Radio base stations (telephony aeriels - no.)	8,076
Points of Presence - POPs (no.)	206

Usage

Voice – fixed telephony (billion minutes)	15.0
Voice – mobile telephony (billion minutes)	9.5
Internet (billion minutes)	24.7

General data

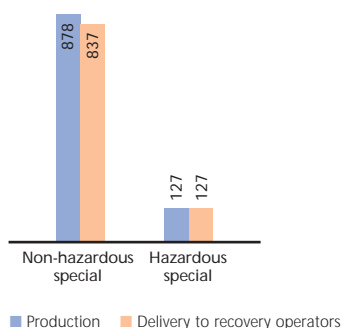
Fixed telephony active customers (millions)	3.1
Mobile telephony customers (millions)	9.9
Registered Internet customers (millions)	15.2
Population coverage by mobile telephony network (%)	98

Resource consumption

Electricity (kWh)	255,824,490
Used for powering telecommunications systems.	
Gas-oil (toe)	2,558
Used in generating sets which supply electricity in emergencies and to installations not connected to the power grid.	

Special waste

Total production: 1,005 t
Total delivery to recovery operators: 963 t



Emissions into the atmosphere

CO ₂ (t)	7,852
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The emissions of carbon dioxide are produced by the combustion of the gas-oil used in generating sets.

Terna

Terna owns more than 90% of the national power transmission grid and is responsible for its operation, maintenance and development on the basis of the directions of GRTN (Gestore della Rete di Trasmissione Nazionale, the Italian Independent System Operator).

Terna's transmission grid is the country's most important infrastructure for energy transmission. In 2003, Terna acquired about 900 km of high-voltage grid from Enel Distribuzione.

Terna supplies specialist services to owners of high- and extra-high voltage systems or of remote control and operation systems in accordance with customer care and environmental protection principles.

Terna also offers its infrastructures as supports for aeriels, fiber-optic cables, sensors, etc., as well as related services to Wind and third parties.

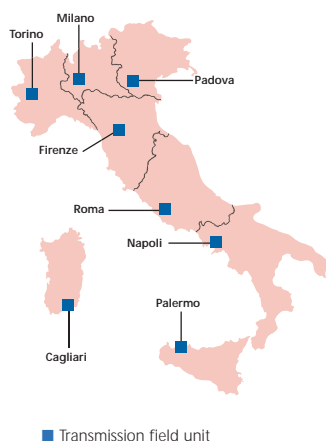
Power line towers with low environmental impact in protected areas

As part of its program of mitigation of the environmental impact of its power lines, Terna developed six single-mast towers along its "Laino-Rizziconi" 380 kV power line in the Pollino Park (Calabria).

Single-mast design towers are particularly suitable for supporting power lines in areas of high natural value, given the small space requirements of their foundations.

The towers were built with a low environmental impact process involving the assembly of prefabricated elements by means of helicopters. This process is now commonly used both for building power lines and for minimizing ancillary structures (e.g. access roads and construction sites), which would be highly invasive.

Given its scale and voltage level, the project represents the most important Italian initiative taken so far in this area.



For additional information, contact:
 Giovan Battista Cavallari
 Viale Regina Margherita, 125
 00198 Roma
 Tel. no. +39-068305.4877
giovannibattista.cavallari@enel.it

Power installations

ELECTRICAL STATIONS

	no.	Installed transforming capacity MVA
380 kV	121	79,920
220 kV	107	24,693
< 220 kV	67	2,872
	295	107,485

LINES (km)

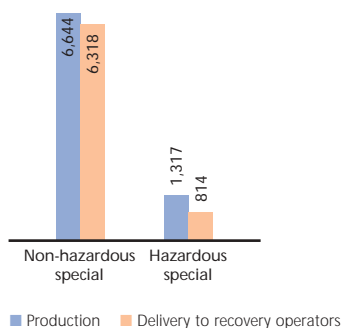
	Circuits	Lines
380 kV	9,866	9,016
220 kV	9,296	7,751
< 220 kV	18,349	17,310
Direct-current links	1,066	747
	38,577	34,824

Electricity

Own consumption
 (for operation of the power grid - million kWh) 107

Special waste

Total production: 7,961 t
Total delivery to recovery operators: 7,133 t



Emissions into the atmosphere

SF₆ (kg)
 (t of CO₂-equivalent) 1,636
 39,103



Eco-Balance and Indicators

Eco-Balance

Electricity generation, transmission and distribution are the activities of Enel which have the most significant effects on and interactions with the environment.

Also in 2003, primary energy (fuels and electricity) consumption, greenhouse gas emissions and special waste production in non-electric activities (gas distribution and telecommunications) were about 1,000 times lower than those in electric activities alone. Moreover, in Enel's non-electric activities, water consumption, as well as air and water emissions of pollutants are practically equal to zero. However, the eco-balance extends to all the industrial activities that Enel carries out in Italy and quantifies in an integrated way their interactions with the environment.

The data of the eco-balance are divided into three sections:

- > resources;
- > processes and products;
- > emissions.

For each item, the eco-balance gives the data for the past five years and related comments. With regard to gas distribution and telecommunications, the data relevant to the first three years of the period are not reported; nevertheless, note that gas distribution only appeared among Enel's activities in 2000.

It is worth recalling that, in the course of 2003, Enel recorded the following changes in its assets:

- > sale of Interpower (subsequently Tirreno Power) – about 63 MW of hydro capacity and over 2,500 MW of thermal capacity – which concluded the sale of Enel's three Gencos;
- > sale of the distribution grids of the Municipalities of Vercelli, Gorizia, Vicenza, Terni, Brescia and of 52 other minor Municipalities (including 3 previously served by Deval) – distributing a total of about 4 billion kWh of electricity per year – as well as the acquisition of the grids of 10 minor Municipalities;
- > transfer from Enel Distribuzione to Terna of roughly 900 km of high-voltage power distribution grid.

The sale of Interpower and the sale or acquisition of distribution grids (except for: the sale of the grids of Brescia and of 45 nearby Municipalities, arising from a voluntary initiative; and the sale of the grids of the Municipalities previously served by Deval, resulting from a ruling of " TAR" , the Regional Administrative Court) were carried out in accordance with Legislative Decree no. 79 of March 16, 1999. The Decree stipulates, among others, that each power producer/importer shall not generate or import more than 50% of the total electricity generated in or imported to Italy. The Decree also contains provisions on rationalization of the electricity distribution business.

The transfer of the distribution grid from Enel Distribuzione to Terna was made in compliance with a Ministerial Decree of December 23, 2002, through which the Ministry of Production Activities changed the extent of the national transmission grid, by incorporating elements of the high-voltage grid previously belonging to distribution grids.

As a result of the above-mentioned changes in the size of Enel's activities, most of the variations appearing in the data in the course of the reported period are poorly significant or self-evident. Thus, the percentage changes recorded in the data in the entire period and in the last year have been omitted.

To facilitate the interpretation and assessment of the eco-balance data, the following table summarizes the number and type of Enel's power installations in Italy as of December 31 of each of the years elapsed from 1999 to 2003.

Generating mix

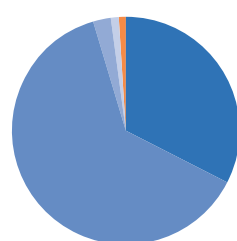
	1999	2000	2001	2002	2003
Power plants (no.)	687	711	658	613	593
> hydro	594	615	555	517	495
> thermal	57	59	59	48	45
> geothermal	32	33	33	34	34
> wind*	2	2	6	9	14
> solar (photovoltaic)**	2	2	5	5	5
* in addition to: wind test fields	2	1	1	0	0
** in addition to: photovoltaic test fields	1	1	0	0	0
isolated photovoltaic systems	n.a.	n.a.	n.a.	201	201
Net maximum capacity (MW)	55,842	56,349	49,981	43,752	41,847
> hydro	16,581	16,890	15,061	14,344	14,330
> thermal	38,648	38,838	34,336	28,679	26,719
> geothermal	584	595	540	666	666
> wind	25	23	40	59	128
> solar (photovoltaic)	3.5	3.3	3.6	4.1	4.2

Power lines circuit-length (km)

	1999	2000	2001	2002	2003
Total	1,088,225	1,100,096	1,097,458	1,100,593	1,120,944
> high voltage (40 to 380 kV)	57,338	57,620	57,372	57,899	57,913
> medium voltage (1 to 30 kV)	328,188	331,793	331,181	332,055	334,546
> low voltage (up to 380 V)	702,699	710,683	708,905	710,639	728,486

Net maximum generating capacity as of 31 Dec. 2003

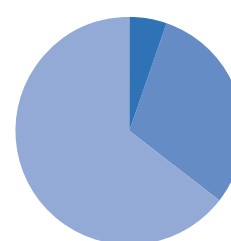
Total: 41,847 MW



■ Hydro 34.24% ■ Wind 0.31%
 ■ Thermal 63.85% ■ Solar (photovoltaic) 0.01%
 ■ Geothermal 1.59%

Circuit-length of power lines as of 31 Dec. 2003

Total: 1,120,944 km



■ High voltage 5.2%
 ■ Medium voltage 29.8%
 ■ Low voltage 65.0%

Gas pipelines length (km)

	1999	2000	2001	2002	2003
Total	-	1,300	9,847	24,890	27,194
> high pressure ($p > 5$ bar)	-	n.a.	n.a.	137	123
> medium pressure ($0.04 \text{ bar} < p \leq 5 \text{ bar}$)	-	n.a.	n.a.	9,370	10,566
> low pressure ($p \leq 0.04 \text{ bar}$)	-	n.a.	n.a.	15,383	16,505

Telecommunications infrastructures

	1999	2000	2001	2002	2003
Fiber-optic networks - length (km)	n.a.	11,230	17,500	18,275	18,200
Radio base stations (telephony aerials) (no.)	n.a.	3,296	5,655	7,369	8,076

Resources

This section shows the consumption of energy resources (fossil fuels, geothermal steam, primary electricity) and non-energy resources (water for industrial uses, expendables).

Fossil fuels

In most of the cases, fossil fuels represent the energy source for thermal generation.

The consumption of fuel oils is indicated on the basis of their sulfur content (HS = high: $> 2.5\%$; MS = medium: $> 1.3\%$ and $\leq 2.5\%$; LS = low: $> 0.5\%$ and $\leq 1.3\%$; VLS = very low: $\leq 0.5\%$).

Orimulsion is an emulsion of bitumen in water, coming from the Orinoco basin (Venezuela); like coal, it is used in power plants equipped with flue gas desulfurizers and denitrification systems.

Gas-oil, a high-cost fuel, is used on an exceptional basis in: gas-turbine power plants that are not connected to the natural gas grid; diesel-engine power plants (supplying some minor Italian islands); start-up of steam-fired thermal plants; and, as an emergency fuel, in all gas-turbine power plants.

The maximum sulfur content in the gas-oil used for electricity generation is specified in the applicable legislation as 0.2% . However, Enel's gas turbines use gas-oil with a sulfur content of 0.05% .

A very small quantity of gas-oil is used also in other activities: for driving geothermal drilling equipment and in the generating sets of telecommunications installations.

The consumption of natural gas is broken down on the basis of its uses: non-technologically captive (when the use of gas is a corporate choice) and technologically captive (when gas feeds single-cycle and combined-cycle gas turbines, for which it is the only practicable option).

With the exhaustion of the mines adjoining the Pietrafitta and Santa Barbara power plants, the use of brown coal was discontinued.

Fuel consumption, obtained from data measured and certified in each installation, is expressed in metric units (thousand tons or million cubic meters). To enable the summing of the various contributions, the overall fuel consumption is expressed in energy potential (thousand tons of oil-equivalent).

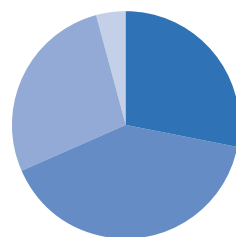
In 2003, the commissioning of additional thermal power plants, converted from oil-firing to combined cycles (about 1,500 MW), justifies the decreasing consumption of fuel-oils and the correspondingly increasing consumption of natural gas, whose technologically-captive use appears for the first time as dominant.

The almost complete disappearance of HS and MS fuel-oils depends on the massive use of "clean" fuels in order to comply with Ministerial Decree of July 12, 1990 on point-source limits of emissions from existing power plants.

Finally, the reduction of coal consumption is related to the sale of the Vado Ligure plant (Interpower).

Fuel consumption for thermal generation in 2003

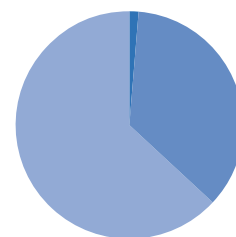
Total: 23,294 ktoe



■ Fuel oil & gas-oil **28.1%**
 ■ Natural gas **40.3%**
 ■ Coal **27.4%**
 ■ Orimulsion **4.2%**

Fuel-oil consumption for thermal generation in 2003

Total: 6,487 kt



■ MS **1.3%**
 ■ LS **35.6%**
 ■ VLS **63.1%**

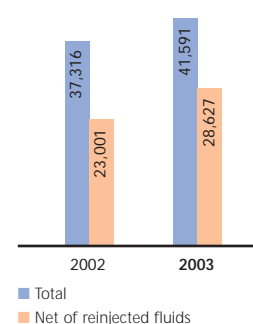
Geothermal fluid

Geothermal fluid, in the form of steam at adequate pressure and temperature values, is the energy source for geothermal generation. A minimum amount of this fluid is allocated to non-electric uses, i.e. uses of resources whose thermodynamic properties are unsuitable for geothermal generation. These uses fall under two main categories: supply of heat (especially for greenhousing and district heating) and extraction of substances (e.g. carbon dioxide for foodstuffs).

In 2003, the geothermal steam used for electricity generation was significantly above the average of the period, after its drop in 2001 owing to the shutdown of some power plants for renovation works.

The capability of geothermal basins is mostly sustained by the reinjection of fluids into the geothermal reservoir. These fluids consist of: the water entrained by steam and separated from it at the well outlet; the steam that is condensed after its expansion in the turbines, net of the fraction evaporated in the cooling tower; and the fluid remaining after non-electric uses. Thanks to reinjection, the geothermal reservoir represents a practically inexhaustible heat resource. The practice of reinjection of fluids into the deep subsoil does not jeopardize shallow aquifers which, among others, are isolated from the wells by metal pipings, cemented to the soil and between them.

Consumption of geothermal fluid
thousand tons



Primary electricity

Electricity is used as energy raw material in telecommunications and, to a minimum extent, in gas distribution.

In the first instance, it is used for the functioning of telecommunications installations.

In the second instance, it is used for cathode protection of gas pipelines, for driving the water pumps of the circuits which heat natural gas upon its depressurization, as well as for lighting gas installations.

Water for industrial uses

Water for industrial uses is consumed:

- > in thermal power plants, mainly to make up for the amounts of water lost in the generation process of steam-turbine power plants and in closed-cycle wet cooling towers, to carry out clean-up jobs (especially of boilers), and to feed auxiliaries and desulfurizers;
- > in geothermal activities for the preparation of the drilling slurry; the amounts of water used in these activities is very variable, depending on the type of activity (e.g. drilling of new wells, rehabilitation or deepening of existing wells) and on the characteristics of the geological formations crossed: however, these amounts are poorly significant (the functioning of cooling towers does not require water, as it is based on re-vaporization of part of the condensates of the steam discharged by turbines).

Water requirements do not include the water used for open-cycle cooling of thermal power plants, because it is returned to the original water body without appreciable physico-chemical changes.

The increasing consumption of water for industrial uses is justified by: the retrofitting of thermal power plants through the installation of desulfurizers – for environmental compliance (Ministerial Decree of July 12, 1990) – all of which have become operational; the new cooling tower systems

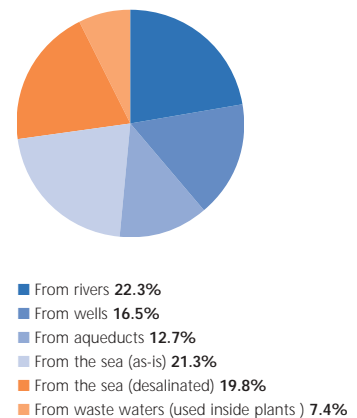
installed in the Fusina and Porto Marghera power plants to decrease the thermal load in the Venice lagoon. The former requirements were practically covered by as-is sea water, the latter by abstraction from inland waters.

Expendables

Expendables complete the list of the resources used; the following are the main ones.

- > Resins are used to produce (via ion exchange) the high-purity water which is needed for the thermal cycle of steam-fired thermal power plants.
- > Hydrazine and carbohydrazide deoxygenate the thermal-cycle water and regulate its pH.
- > Magnesium oxide is injected into the flue gas circuits of thermal power plants fed with vanadium-containing fuels, to prevent corrosion of heat-transfer surfaces due to the indirect action of vanadium.
- > Ammonia is used to regulate the pH of the thermal-cycle water, but at present primarily as a reagent in the flue gas denitrification process.
- > Limestone is the reagent for the flue gas desulfurization process.
- > Lime is mainly used in waste water treatment, thanks to its neutralizing and flocculating properties.
- > Sodium hypochlorite and chlorine dioxide are occasionally added to the cooling waters of steam-fired thermal power plants to prevent deposits and fouling. Ferrous sulfate is used to protect heat-transfer tube surfaces from corrosion.
- > Sulfuric acid, hydrochloric acid and caustic soda are most commonly used in the regeneration of ion-exchange resins and in the clean-up of equipment. However, in geothermal activities, the primary application of soda is as an additive in the slurries used in the drilling of geothermal wells.
- > Bentonite is a clay which is used as a slurry for the drilling of geothermal wells.
- > Barite is used in some cases to thicken bentonite slurries, thereby improving their effectiveness upon the drilling of mechanically unstable rock formations.
- > Geothermal cement is used for joining the steel walls of new wells and for permanent plugging of disused wells.

Coverage of water requirements for industrial uses in 2003
43.4 million m³

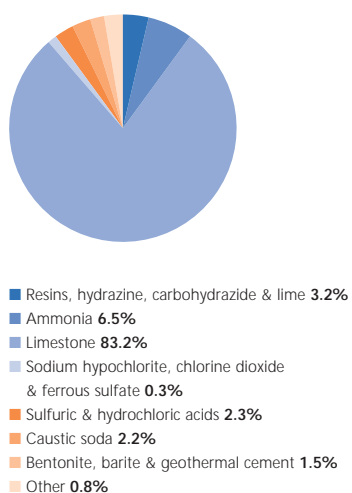


The figures shown for expendables are obtained from the accounting records of purchases, which are held in each installation. Given the small size of stocks and the high number of installations surveyed, the amounts purchased are practically equivalent to those consumed.

It should be pointed out that the consumption of limestone had a trend reversal, thanks to the low-rate operation of desulfurizers in the Sulcis power plant; the plant used lower quantities of local coal, whose sulfur content is about eight times higher than the average sulfur content of the foreign coals used in the other power plants.

Expendables in 2003

Total: 306,136 t



Resources

		1999	2000	2001	2002	2003
Fossil fuels						
Thermal generation						
fuel oil	thousand t	15,420	13,639	10,708	8,241	6,487
> HS	thousand t	1,176	173	221	6	0
> MS	thousand t	6,514	5,741	4,446	2,518	83
> LS	thousand t	3,530	4,114	3,266	2,458	2,309
> VLS	thousand t	4,201	3,610	2,775	3,260	4,095
orimulsion	thousand t	1,689	2,508	1,589	1,620	1,481
gas-oil	thousand t	209	136	75	58	93
natural gas	million m ³	11,302	13,208	10,549	8,893	11,075
> non-technologically captive use	million m ³	7,966	9,547	6,452	6,487	4,520
> technologically captive use	million m ³	3,336	3,661	4,097	2,407	6,555
coal	thousand t	8,395	9,489	10,425	11,295	10,427
brown coal	thousand t	80	19	0	0	0
Total	thousand toe	31,046	32,083	27,022	23,864	23,294
Other activities: geothermal drilling & telecommunications	thousand toe	n.a.	n.a.	n.a.	5.0	4.4
Grand total	thousand toe	n.a.	n.a.	n.a.	23,869	23,299
Geothermal fluid						
Total fluid extracted	thousand t	n.a.	n.a.	n.a.	37,316	41,591
net of reinjected fluids	thousand t	n.a.	n.a.	n.a.	23,001	28,627
Geothermal steam for electricity generation	thousand t	35,339	37,500	35,374	37,112	41,372
Primary electricity (gas distribution & telecommunications)	GWh	n.a.	n.a.	n.a.	199	259
Water for industrial uses						
From rivers	million m ³	11.1	10.8	10.7	8.4	9.6
From wells	million m ³	12.9	14.1	11.4	7.0	7.2
From aqueducts	million m ³	5.5	5.8	5.6	5.5	5.5
Total abstraction from inland waters	million m ³	29.6	30.7	27.7	20.9	22.3
From the sea (as-is)	million m ³	12.2	6.9	5.1	5.8	9.2
From the sea (desalinated)	million m ³	8.0	8.7	8.1	8.4	8.6
From waste waters (used inside plants)	million m ³	4.1	3.6	3.2	3.1	3.2
Total requirements	million m³	53.9	49.9	44.1	38.2	43.4
for thermal generation	million m ³	53.8	49.7	44.1	38.1	43.4
for geothermal drilling	million m ³	0.093	0.192	0.042	0.027	0.001
Expendables						
Resins	t	90	63	81	35	17
Hydrazine	t	71	47	35	51	12
Carbohydrazide	t	n.a.	n.a.	1	13	14
Magnesium oxide	t	n.a.	n.a.	213	153	116
Ammonia	t	15,482	18,703	20,455	22,909	19,869
Limestone	t	333,275	325,150	302,067	327,661	254,828
Lime	t	12,135	14,005	13,541	11,926	9,672
Sodium hypochlorite	t	1,077	1,071	962	612	888
Chlorine dioxide	t	n.a.	n.a.	0	28	13
Ferrous sulfate	t	n.a.	n.a.	0	3	1
Sulfuric & hydrochloric acids	t	7,834	8,354	7,440	5,432	6,931
Caustic soda	t	6,692	7,728	7,237	6,314	6,722
Bentonite	t	1,361	623	1,044	2,045	1,853
Barite	t	6	8	60	0	0
Geothermal cement	t	2,748	1,545	2,331	2,520	2,691
Other	t	6,242	8,915	4,360	3,002	2,508
Total	t	387,015	386,210	359,828	382,703	306,136

n.a.: not available (in 1999 and 2000, the amounts of carbohydrazide, magnesium oxide, chlorine dioxide and ferrous sulfate were included in the "Other" expendables).

Processes and products

The strategy of diversification led Enel to add natural gas distribution and telecommunications (fixed & mobile telephony and Internet) to its electricity generation, transmission and distribution activities.

Electric activities

As regards electricity generation, it is worth recalling that in 2001, 2002 and 2003, the extent of the electricity generating assets falling under Enel's responsibility changed. As a result: from 2001, the data exclude Elettrogen and Valgen; from 2002, the data also exclude Eurogen; while the 2003 data exclude Interpower, too.

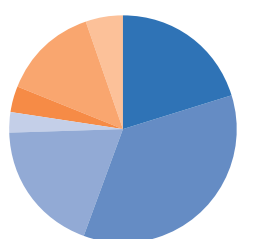
Furthermore,

- > the various contributions are net of the electricity consumed by power plant auxiliaries;
- > the hydro generation from pumped storage is the electricity that is produced, in peak-load hours, through the falling of water pumped from a lower reservoir to an upper reservoir, using electricity surpluses in low-load hours (pumped storage is the only available option for storing significant amounts of electricity, albeit indirectly);
- > the actually available generation is the total net generation, after deducting the electricity consumed for pumped storage.

In terms of trends, the 2003 data show that, in spite of the sale of Interpower, the contribution of thermal generation increased, owing to low availability of water resources and thus to the contraction of hydro generation. However, the contraction was offset, to a certain extent, by the further growth of geothermal and wind generation.

Net electricity generation by source in 2003

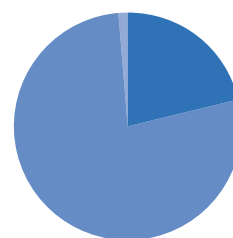
Total: 137,794 million kWh



■ Fuel oil & gas-oil **20.2%**
 ■ Natural gas **35.4%**
 ■ Coal **18.9%**
 ■ Orimulsion **2.9%**
 ■ Geothermal, wind & solar **3.7%**
 ■ Hydro from natural flows **13.6%**
 ■ Hydro from pumped storage **5.3%**

Net electricity generation from renewables in 2003

Total: 23,792 million kWh



■ Geothermal **21.2%**
 ■ Hydro from natural flows **78.5%**
 ■ Wind & solar (photovoltaic) **0.3%**

As regards electricity transmission and distribution, with the disaggregation of its vertically integrated electric activities, the transfer of its dispatching assets to GRTN, the Italian independent transmission system operator, and the start of the liberalized market (option for “eligible” customers to choose their supplier), Enel has lost the possibility of measuring the electricity wheeled on the transmission grid and, in general, of both measuring and directly controlling grid losses. In the past, these losses, expressed as a percentage of electricity demand, were among the indicators of power system efficiency.

Therefore, from 2002, reference is made only to the electricity wheeled on the distribution grid (total electricity delivered to final customers connected to the grid).

**Natural gas
distribution**

The amount of natural gas wheeled represents the total amount of gas that is delivered to customers. The consumption of natural gas for operation of the grid (“own consumption”) is due to the combustion of one fraction of the gas that is wheeled; this fraction is used for heating of the gas, to prevent it from freezing upon depressurization.

The natural gas losses from the grid are estimated on the basis of the amount of natural gas wheeled, using loss factors (average value in the two years surveyed: 0.35% by volume) which take into account gas pressures, length and configuration of pipelines, their state of conservation, etc.

Telecommunications

Usage (voice and Internet) is the “product” of this activity, i.e. the quantity that defines the extent of the relevant process.

Processes and products

		1999	2000	2001	2002	2003
Electricity generation (net)						
Thermal from fossil fuels	million kWh	136,946	141,391	118,569	104,735	106,669
<i>from fuel oil & gas-oil</i>	<i>million kWh</i>	<i>66,987</i>	<i>59,325</i>	<i>46,211</i>	<i>35,184</i>	<i>27,838</i>
<i>from natural gas</i>	<i>million kWh</i>	<i>43,426</i>	<i>52,147</i>	<i>42,259</i>	<i>37,024</i>	<i>48,802</i>
<i>from coal & brown coal</i>	<i>million kWh</i>	<i>21,872</i>	<i>23,316</i>	<i>25,883</i>	<i>28,038</i>	<i>25,978</i>
<i>from orimulsion</i>	<i>million kWh</i>	<i>4,661</i>	<i>6,602</i>	<i>4,216</i>	<i>4,489</i>	<i>4,052</i>
From renewables	million kWh	35,488	34,660	31,423	24,834	23,792
<i>thermal from biogas</i>	<i>million kWh</i>	<i>-</i>	<i>-</i>	<i>25</i>	<i>-</i>	<i>-</i>
<i>geothermal</i>	<i>million kWh</i>	<i>4,128</i>	<i>4,415</i>	<i>4,239</i>	<i>4,382</i>	<i>5,036</i>
<i>hydro from natural flows</i>	<i>million kWh</i>	<i>31,335</i>	<i>30,221</i>	<i>27,129</i>	<i>20,399</i>	<i>18,679</i>
<i>wind & solar (photovoltaic)</i>	<i>million kWh</i>	<i>25</i>	<i>24</i>	<i>29</i>	<i>53</i>	<i>77</i>
Hydro from pumped storage	million kWh	6,379	6,477	6,961	7,543	7,333
Total	million kWh	178,813	182,527	156,952	137,112	137,794
Consumption for pumping	million kWh	8,800	9,066	9,653	10,595	10,369
Available generation	million kWh	170,013	173,461	147,299	126,518	127,425
Electricity distribution						
Electricity wheeled	million kWh	n.a.	n.a.	n.a.	258,469	244,426
Natural gas distribution						
Natural gas wheeled	million m ³	-	n.a.	n.a.	3,166	3,493
Consumption of natural gas for operation of the grid	million m ³	-	n.a.	n.a.	2	6
Losses of natural gas along the grid	million m ³	-	n.a.	n.a.	11	12
Telecommunications						
Voice usage - fixed telephony	billion minutes	n.a.	n.a.	n.a.	21.0	15.0
Voice usage - mobile telephony	billion minutes	n.a.	n.a.	n.a.	7.8	9.5
Internet usage	billion minutes	n.a.	n.a.	n.a.	27.0	24.7

n.a.: not available.

Emissions

Emissions into the atmosphere

The tables display the amounts of emissions in the gaseous, liquid and solid form.

The emissions of some substances into the atmosphere have a polluting effect, while the emissions of other substances contribute to the greenhouse effect.

The most significant emissions into the atmosphere, which are quantitatively significant and typical of Enel's industrial activities are as follows: in the first category, sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulates and hydrogen sulfide (H₂S); and, in the second category, carbon dioxide (CO₂) sulfur hexafluoride (SF₆) and methane (CH₄).

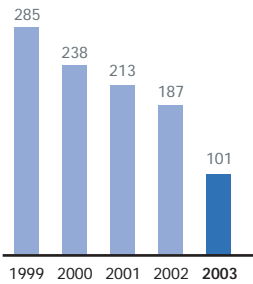
> SO₂, NO_x and particulates originate from the combustion process in thermal power plants.

The amounts shown include both emissions yearly reported to the Ministry of the Environment (SO₂ and NO_x from "large combustion systems" and particulates from "steam-fired thermal power plants") and emissions from the other power plants.

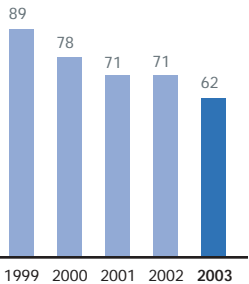
Their values are obtained by multiplying their concentrations in the flue gases (generally continuously monitored) by the volumes of the same flue gases. NO_x are expressed in terms of NO₂-equivalent.

Over the years, all these emissions fell significantly, thanks above all to: the wide use and constant tuning of advanced combustion systems (prevention measures); the installation or upgrading of flue gas abatement systems (desulfurizers in large coal- and orimulsion-fired plants; denitrification systems in the same plants or in other plants when prevention measures are insufficient; particulate collection systems in almost all plants,

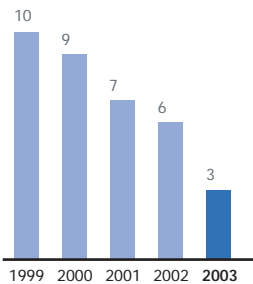
SO₂ emissions from fossil-fired thermal generation
only power plants included within Enel's present limits (thousand t)



NO_x emissions from fossil-fired thermal generation
only power plants included within Enel's present limits (thousand t)



Particulate emissions from fossil-fired thermal generation
only power plants included within Enel's present limits (thousand t)



including oil-fired ones; the latter systems are usually based on electrostatic precipitators, but also on more efficient fabric filters, which are suitable for all-coal-fired plants); as well as the use of high-grade fuels.

These emissions show a decrease even when reference is made only to the power plants included within Enel's present limits; this happened also in 2003, in spite of the above-mentioned increase of thermal generation.

- > H₂S is the only potentially polluting substance which is present in significant amounts in geothermal fluid.

Its values are estimated on the basis of periodical monitoring of the composition and flow rate of geothermal steam used by power plants.

- > CO₂ is the typical product of combustion and, as such, the near totality of it derives from thermal power plants. Small amounts - reported here in view of the attention paid to the greenhouse effect - also derive from geothermal drilling (combustion of the gas-oil which feeds the diesel engines of drilling equipment), from distribution of natural gas (combustion of one fraction of the wheeled gas for heating of the gas upon depressurization) and from telecommunications (combustion of gas-oil feeding the generating sets of telecommunications installations).

CO₂ is also contained, albeit in much lower amounts, in the reaction products from the process of desulfurization of the flue gases outgoing from the boilers of some thermal power plants.

The CO₂ from combustion is computed by applying specific emission factors to the consumption of the various fuels. The factors used in the past conformed to the criteria adopted by the Ministry of the Environment: 4.03 t of CO₂/toe for coal and coal-derived products; 3.27 for oil products; 2.35 for natural gas. Since 2001, these factors have been replaced by those recommended by the 1996 IPPC (International Panel on Climate Change) Guidelines for national greenhouse gas inventories and transposed into the second national report on greenhouse gas emissions: 3.24 t of CO₂/toe for fuel oil; 3.38 for orimulsion; 3.10 for gas-oil; 2.35 for natural gas; 4.02 for coal; 4.24 for brown coal. Each of these factors is then multiplied by a correction coefficient which accounts for the typical fraction of unburned carbon: 0.980 for solid fuels; 0.990 for liquid fuels; 0.995 for gaseous fuels. As in the past, the computation considers that the burned carbon fraction - whose value, as indicated above, is now taken to be below 100% - is completely oxidized to CO₂.

As the application of the new emission factors and of the related correction coefficients was extended to the entire time series, it also modified the time series of avoided CO₂ emissions, as well as of specific CO₂ emissions (from fossil-fired thermal generation and total electricity generation, see next Chapter on "Indicators").

The amount of CO₂ from the desulfurization process is computed stoichiometrically from the amount of limestone used.

In line with the aforesaid IPCC Guidelines, the following emissions have not been reported:

- emissions of CO₂ from combustion of renewable organic sources, because the CO₂ that is released into the atmosphere practically offsets the CO₂ that is absorbed by biomass during its growth (these emissions only refer to 2001, when Enel generated electricity from landfill gas);
- emissions of CO₂ from geothermal steam, which are not regarded as anthropogenic; indeed, the emissions from geothermal power plants are counterbalanced by an equivalent reduction of natural emissions – visible or invisible exhalations – from the soil of geothermal areas.

- > SF₆ is used in high- and medium-voltage electrical equipment as an insulant and for electric arc extinction; in these applications, it is irreplaceable. Its emissions into the atmosphere are due to leaks from the above equipment. In 2003, 28% of SF₆ emissions were due to electricity generation, 32% to electricity transmission and 40% to electricity distribution.

These emissions are determined with a complex procedure (difference between the weights of SF₆ contained in the bottles used for replenishment, at the start of the year and at the end of the year, increased by the weight of SF₆ contained in the bottles purchased or acquired during the year and decreased by the weight of SF₆ contained in the bottles transferred during the year). This procedure makes it possible to report fairly reliable data on SF₆ emissions.

The amounts of SF₆ are expressed in weight of SF₆ and in weight of CO₂-equivalent, in terms of Global Warming Potential (GWP = 23,900).

The values of SF₆, when expressed in CO₂-equivalent, appear to be extremely low (in 2003, 1.7‰ of Enel's overall greenhouse gas emissions). The variability of SF₆ emissions from one year to the other is largely due to the occasional character of the above-mentioned replenishment jobs.

- > CH₄ emissions are due to the losses of natural gas from the distribution grid.

They are determined on the basis of grid losses, taking into account the methane content of natural gas (average value in 2003: 92.9%) and its density (average value in 2003: 0.555 kg/m³).

They are expressed both in weight of CH₄ and in weight of CO₂-equivalent, in terms of Global Warming Potential (GWP = 21).

The values of CH₄, when expressed in CO₂-equivalent, appear to be extremely low (1.8‰ of Enel's overall greenhouse gas emissions in 2003).

With regard to 'minor' pollutants (e.g. metals), Enel conducted extensive programs of monitoring of their concentrations, under different conditions of types of fuel and presence of flue gas abatement systems. The results indicate that these concentrations comply – with wide margins – with the point-source limits of emissions established by the Ministerial Decree of July 12, 1990.

Avoided CO₂ emissions

Avoided CO₂ emissions are an indicator of the environmental benefits arising from the mix of energy sources used for production processes and from the efficiency of the full cycle, from the utilization of the sources to the end-uses of the various products.

The tables show the CO₂ emissions which were avoided thanks to electricity generation from renewables, rather than from the otherwise necessary conventional fuels.

These emissions are determined by multiplying the electricity generation from each renewable source by the average specific CO₂ emissions from Enel's fossil-fired thermal generation. In the case of hydro power, reference is made to generation from natural flows alone, excluding the contribution of pumped-storage power plants.

The reported percentage variations are obviously consistent with the corresponding variations in electricity generation.

In 2003, generation of electricity from renewables avoided over 18% of CO₂ emissions, which would have been produced by Enel's electric activities, should generation from renewables have been absent.

Waste waters

Waste waters include residual process water and meteoric waters collected from the outdoor areas of thermal power plants. After being treated, these waters are in part used inside the plants – thereby contributing to the coverage of water requirements for industrial uses – and in part returned to water bodies.

The volumes of waste waters are estimated by referring to the potential capability of water treatment systems, to their utilization, as well as to the modes of operation of the power plants where these systems are installed.

As is obvious, their trend is reflective of the trend of water requirements for industrial uses.

However, in 2003, owing to scarce rainfall, the amount of waste waters decreased, in spite of the above-mentioned increase in water requirements.

Releases into water bodies

Waste waters carry substances that alter the physico-chemical characteristics of the recipient water bodies, thus having a negative impact on ecosystems and preventing subsequent water uses (e.g. for drinking and farming).

In the case of Enel, the extent of the problem is much smaller than in other industries, such as the chemical industry. Nevertheless, the applicable legislation specifies strict limits for concentration of pollutants, with which Enel complies thanks to the use of treatment systems. Note that treatment systems are also needed for the waste waters that are reused inside Enel's power plants (reducing the requirements of water for industrial uses) to comply with specifications.

In the treatment, waste waters are distinguished on the basis of their characteristics (acidic/alkaline,

oily, coming from desulfurizer drains, meteoric, sanitary), and some of their parameters (e.g. conductivity, pH, turbidity, dissolved oxygen and oil content) are continuously monitored. This monitoring activity ensures compliance with regulatory limits; indeed, when pollutant concentrations get close to regulatory limits, waste waters are treated again.

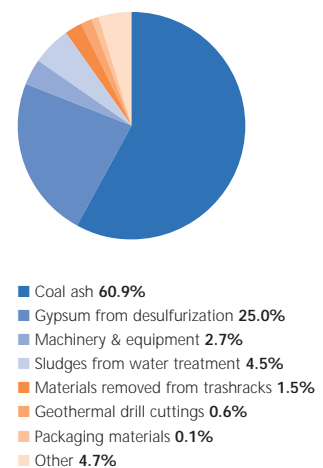
Over the years, larger and larger samples of power plants have had their waste water releases monitored. The generalized use of environmental management systems (albeit not yet certified) in thermal power plants made it possible – for the first time in 2003 – to report, for all waste water releases (i.e. net of the amounts used inside power plants), overall emissions of typical and quantitatively significant pollutants (metals and compounds, nitrogen and compounds, phosphorus and compounds), as well as COD (Chemical Oxygen Demand) and BOD (Biochemical Oxygen Demand). The data were obtained by multiplying the concentrations by the volumes of waste waters discharged into water bodies.

Special waste

Special waste represents the refuse from Enel's industrial activities. This refuse is regulated by Legislative Decree no. 22 of February 5, 1997, as amended, which classifies it into non-hazardous and hazardous waste.

> Non-hazardous waste includes not only coal ash and gypsum from desulfurization, but also fuel-oil bottom ash, orimulsion ash (from 2002, only bottom ash) and other materials which are typical of the various activities: machinery & equipment and their parts; supports of power lines; conductors; cables; sludges from water treatment; materials removed by Enel from the trashracks of hydro plant intake structures; the portion of alluvial sediments that is removed from hydro basins upon desilting and that is not reused locally; drill cuttings from geothermal activities, etc. This waste also includes materials of a general or exceptional nature (packaging materials, clothing, debris from construction and demolition, etc.).

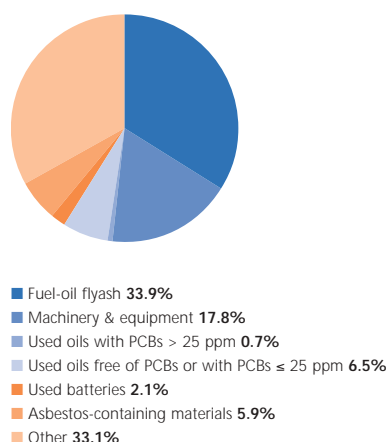
Non-hazardous special waste in 2003
Total production: 1,772,962 t



- > Hazardous waste comprises fuel-oil flyash, materials which are typical of the various activities (namely, PCB-containing transformers and capacitors, their parts, batteries, used oils, sludges from condensation of geothermal steam, etc.) or of a general or exceptional nature (dirt and deposits, asbestos, etc.).

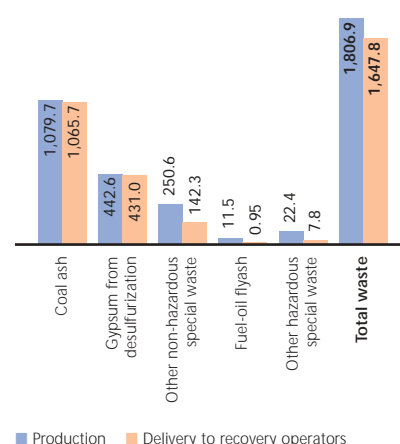
Hazardous special waste in 2003

Total production: 33,909 t



Main categories of special waste in 2003

(thousand t)



The waste data (aggregated by the most representative types) are those yearly reported to the Public Inventory of Waste. These reports are based on the qualitative and quantitative characteristics of the waste, recorded at least on a weekly basis in the books of incoming and outgoing waste.

"Waste production" refers to the amounts of waste recorded as "incoming waste" in the books of incoming and outgoing waste.

"Waste delivered to recovery operators" refers to the amounts of waste which is delivered to authorized operators of waste recovery plants (possibly, Enel itself).

The following trends emerge from the data:

- > the production of ash is obviously correlated with fuel consumption and characteristics, but it reflects fluctuations that depend on: the frequency of ash removal from flue gas ducts and from the hoppers of boilers and of particulate collectors; the possible addition of water to the ash to prevent the formation of dust during its temporary storage on the plant site; the combustion of flyash in the upper part of boiler furnaces in the case of dual oil-gas firing, etc.;
- > the production of gypsum from desulfurization reflects limestone consumption;
- > the production of "other waste", non-hazardous and hazardous, may depend on contingent circumstances, such as demolition work and environmental rehabilitation efforts (e.g. 2001-2006 Plan of Environmental Rehabilitation of Geothermal Areas).

Note, in the Tables, that the amounts of "waste delivered to recovery operators" may exceed those of "waste production", when the waste has been temporarily stored on the plant site in a given year but delivered to recovery operators only in the subsequent year.

Finally, it is worth stressing that, in 2003, 141,300 tons of alluvial sediments (removed with mechanical equipment upon desilting of basins) were used locally (e.g. for restoring the embankments of hydro basins) and thus not included in waste production.

Emissions

Source			1999	2000	2001	2002	2003
Emissions into the atmosphere							
SO ₂	fossil-fired thermal generat.	thousand t	404	354	284	196	101
NO _x	fossil-fired thermal generat.	thousand t	144	129	101	75	62
Particulates	fossil-fired thermal generat.	thousand t	16	14	10	6	3
H ₂ S	geothermal generation	thousand t	25	28	25	21	24
CO ₂	fossil-fired thermal generat. (from combustion)	thousand t	95,170	97,718	83,742	75,246	71,345
	fossil-fired thermal generat. (from desulfurization)	thousand t	147	143	133	144	112
	total from fossil-fired thermal generation	thousand t	95,317	97,861	83,875	75,391	71,457
	geothermal drilling, gas distribution, telecommunications	thousand t	n.a.	n.a.	n.a.	19	24
	Total	thousand t	n.a.	n.a.	n.a.	75,410	71,482
SF ₆	electricity generation, transmission & distribution	kg	3,447	4,906	4,398	4,652	5,099
		thousand t CO ₂ -equivalent	82	117	105	111	122
CH ₄	gas distribution	thousand t	-	n.a.	n.a.	6	6
		thousand t CO ₂ -equivalent	-	n.a.	n.a.	120	132
Total greenhouse gases (CO ₂ , SF ₆ , CH ₄)		thousand t CO ₂ -equivalent	n.a.	n.a.	n.a.	75,641	71,736
Avoided CO ₂ emissions							
Hydro generation from natural flows		thousand t	21,809	20,917	19,191	14,684	12,513
Geothermal generation		thousand t	2,873	3,056	2,999	3,154	3,373
Generation from wind & solar		thousand t	17	17	20	38	52
Generation from biogas		thousand t	-	-	18	-	-
Total		thousand t	24,700	23,989	22,228	17,876	15,938
Waste waters (discharged into water bodies)							
	thermal generation	million m ³	23.0	22.3	20.2	16.4	12.6
Releases into water bodies							
Metals and compounds (expressed as metal equivalent)	thermal generation	kg	n.a.	n.a.	n.a.	n.a.	4,605
Total nitrogen (expressed as N)	thermal generation	kg	n.a.	n.a.	n.a.	n.a.	50,696
Total phosphorus (expressed as P)	thermal generation	kg	n.a.	n.a.	n.a.	n.a.	3,381
COD	thermal generation	kg	n.a.	n.a.	n.a.	n.a.	408,067
BOD	thermal generation	kg	n.a.	n.a.	n.a.	n.a.	62,575

n.a.: not available.

Emissions

Source		1999	2000	2001	2002	2003
Special waste						
Non-hazardous						
Coal bottom ash	thermal generation					
production	t	50,542	34,738	63,761	58,311	35,855
delivery to recovery operators	t	50,097	34,265	63,735	58,336	35,855
Coal flyash	thermal generation					
production	t	839,411	952,367	1,056,605	1,146,320	1,043,885
delivery to recovery operators	t	891,744	958,411	981,465	1,078,017	1,029,882
Gypsum from desulfurization	thermal generation					
production	t	509,294	562,220	470,240	579,777	442,598
delivery to recovery operators	t	502,325	574,151	428,666	547,872	431,009
Other						
production	electricity generation & geothermal drilling	t	116,473	135,950	168,867	219,723
	electricity transmission & distribution	t	96,537	87,842	61,598	52,218
	gas distribution & telecommunications		n.a.	n.a.	n.a.	233
	Total	t	n.a.	n.a.	n.a.	272,174
delivery to recovery operators	electricity generation & geothermal drilling	t	74,706	81,222	116,938	99,950
	electricity transmission & distribution	t	86,016	83,074	57,145	49,422
	gas distribution & telecommunications		n.a.	n.a.	n.a.	116
	Total	t	n.a.	n.a.	n.a.	149,488
Total						
production	electricity generation & geothermal drilling	t	1,515,719	1,685,275	1,759,473	2,004,131
	electricity transmission & distribution	t	96,537	87,842	61,598	52,218
	gas distribution & telecommunications		n.a.	n.a.	n.a.	233
	Total	t	n.a.	n.a.	n.a.	2,056,582
delivery to recovery operators	electricity generation & geothermal drilling	t	1,518,872	1,648,049	1,590,803	1,784,175
	electricity transmission & distribution	t	86,016	83,074	57,145	49,422
	gas distribution & telecommunications		n.a.	n.a.	n.a.	116
	Total	t	n.a.	n.a.	n.a.	1,833,714

n.a.: not available.

Emissions

Source		1999	2000	2001	2002	2003
Special waste						
Hazardous						
Oil flyash	thermal generation					
production	t	40,520	27,588	14,532	14,911	11,479
delivery to recovery operators	t	16,172	4,393	2,639	656	948
Other						
production	electricity generation & geothermal drilling	t	6,995	6,882	6,298	10,126
	electricity transmission & distribution	t	6,222	4,472	6,864	8,373
	gas distribution & telecommunications	t	n.a.	n.a.	n.a.	32
	Total	t	n.a.	n.a.	n.a.	18,532
delivery to recovery operators	electricity generation & geothermal drilling	t	2,869	1,699	1,408	1,414
	electricity transmission & distribution	t	5,086	2,807	4,417	5,730
	gas distribution & telecommunications	t	n.a.	n.a.	n.a.	0
	Total	t	n.a.	n.a.	n.a.	7,144
Total						
production	electricity generation & geothermal drilling	t	47,516	34,471	20,830	25,038
	electricity transmission & distribution	t	6,222	4,472	6,864	8,373
	gas distribution & telecommunications		n.a.	n.a.	n.a.	32
	Total	t	n.a.	n.a.	n.a.	33,443
delivery to recovery operators	electricity generation & geothermal drilling	t	19,041	6,092	4,047	2,070
	electricity transmission & distribution	t	5,086	2,807	4,417	5,730
	gas distribution & telecommunications		n.a.	n.a.	n.a.	0
	Total	t	n.a.	n.a.	n.a.	7,801
Total special waste						
production	electricity generation & geothermal drilling	t	1,563,235	1,719,746	1,780,303	2,029,168
	electricity transmission & distribution	t	102,759	92,314	68,462	60,591
	gas distribution & telecommunications		n.a.	n.a.	n.a.	265
	Total	t	n.a.	n.a.	n.a.	2,090,025
delivery to recovery operators	electricity generation & geothermal drilling	t	1,537,912	1,654,141	1,594,850	1,786,246
	electricity transmission & distribution	t	91,102	85,880	61,562	55,152
	gas distribution & telecommunications		n.a.	n.a.	n.a.	116
	Total	t	n.a.	n.a.	n.a.	1,841,514
						1,647,792

n.a.: not available.

Indicators

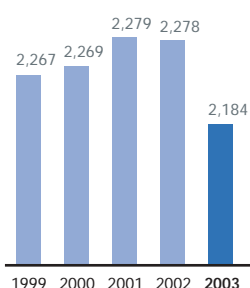
Indicators (ratios between homogeneous or heterogeneous quantities) are used to analyze Enel's environmental performance over time, regardless of the volume of activities in each year.

The following paragraphs describe the characteristics of the indicators presented in the tables and provide comments, if any, on their trends.

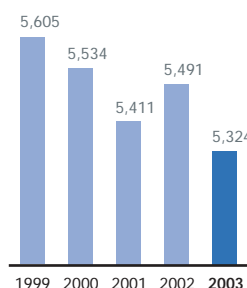
Conservation and quality of resources

- > The net heat rate of fossil-fired thermal generation defines the average quantity of fossil fuels, which are consumed by thermal power plants to generate one kWh net.
Its trend in the first four years of the period is the result of the opposite effects of the growing internal electricity consumption related to the wide use of flue gas abatement systems and of the entry into operation of new high-efficiency combined-cycle plants. The latter was by far predominant in 2003.
- > The net heat rate of geothermal generation defines the average quantity of geothermal steam which is used by geothermal power plants to produce one kWh net.
Its trend reflects the increasingly efficient utilization of the geothermal resource, thanks also to the renovation of some old plants. In 2001, owing to the shutdown of these plants for the works, the net heat rate of geothermal generation was significantly lower than the average recorded in the first four years of the period.
- > The net efficiency of hydro generation from pumped storage expresses, in percentages, the ratio of the electricity produced by pumped-storage hydro power plants to the electricity consumed for pumping.
- > The natural gas consumption for operation of the grid and the losses of natural gas from the grid are expressed as percentages of the total gas distributed.
- > The net specific requirements of water for industrial uses in thermal generation express the amount of water consumed per kWh net of thermal generation.
Their increase in 2003 is mainly ascribable to the entry into operation of the last desulfurizers and of the cooling towers installed in the Fusina and Porto Marghera power plants. If the

Net heat rate of fossil-fired thermal generation
(kcal/kWh)



Net heat rate of geothermal generation
(kcal/kWh)

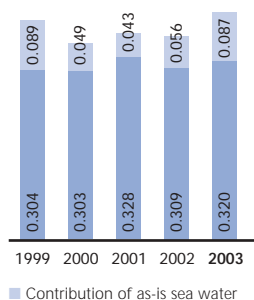


contribution of as-is sea water (main source for covering the water requirements of desulfurizers) is excluded, the increase is much less significant.

- > The percentage contributions to coverage of the requirements of water for industrial uses show the downward trend of inland waters (rivers, wells and aqueducts) in the past three years.
- > The fossil fuel consumption reflects: a further substantial decrease of fuel oils (now only low- and very low-sulfur - LS and VLS - oils are used) and the role of natural gas as the dominant fuel. Thanks to the entry into operation of new combined-cycle power plants, the technologically captive uses of gas have more than doubled in the last year, prevailing over non-captive uses, i.e. uses of gas in lower-efficiency multi-fuel plants in order to respond to local environmental needs.
- > The share of geothermal fuel which has suitable thermodynamic characteristics and is thus allocated to electricity generation accounts for the near totality of the total geothermal fluid extracted.

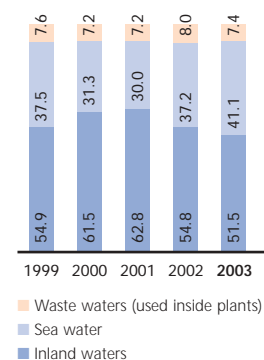
Specific requirements of water for industrial uses in thermal generation

(liters/kWh)



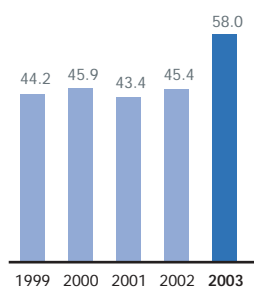
Coverage of requirements of water for industrial uses

(%)



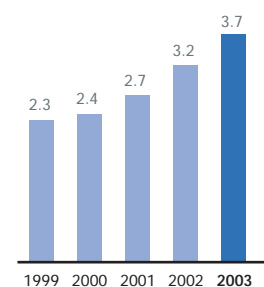
Consumption of natural gas and VLS fuel oil

(% of total fuel consumption for fossil-fired thermal generation)



Thermal generation from biogas, geothermal, wind & solar (photovoltaic) sources vs. total electricity generation

(%)



- > The generation from renewables, expressed as a percentage of total electricity generation, reflects a low value of the hydro energy capability index also in 2003, but shows the progressive growth of all other contributions.

Specific emissions into the atmosphere

As far as electricity generation is concerned, they express the amounts of the typical and significant substances (see page 51 - "Emissions into the atmosphere") that are released into the atmosphere per kWh net of (thermal, geothermal or total) electricity generation.

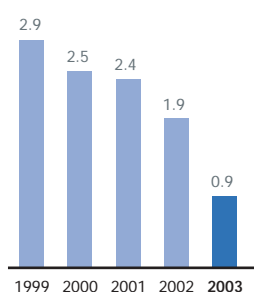
Specific emissions represent:

- > for SO₂, NO_x and particulates: the cumulative effect of the fossil fuel mix, of the efficiency of thermal power plants and of direct prevention and abatement measures;
- > for CO₂: the cumulative effect of the fossil fuel mix and of the efficiency of thermal power plants; the contribution due to the operation of desulfurizers is definitely marginal but included in the data;
- > for H₂S: the cumulative effect of the composition of geothermal steam and of the efficiency of geothermal power plants and abatement systems.

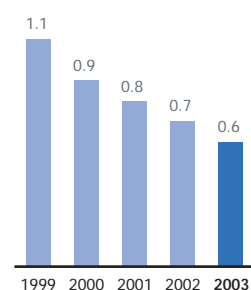
The trends of specific emissions of SO₂, NO_x and particulates show progressive reductions, thanks to the combined effect of: i) advanced combustion systems; ii) flue gas emission abatement systems, whose phasing-in was completed as part of the plan for retrofitting thermal plants for environmental compliance; iii) growing reliance on high-grade fuels; and ii) increase of the average efficiency of thermal power plants.

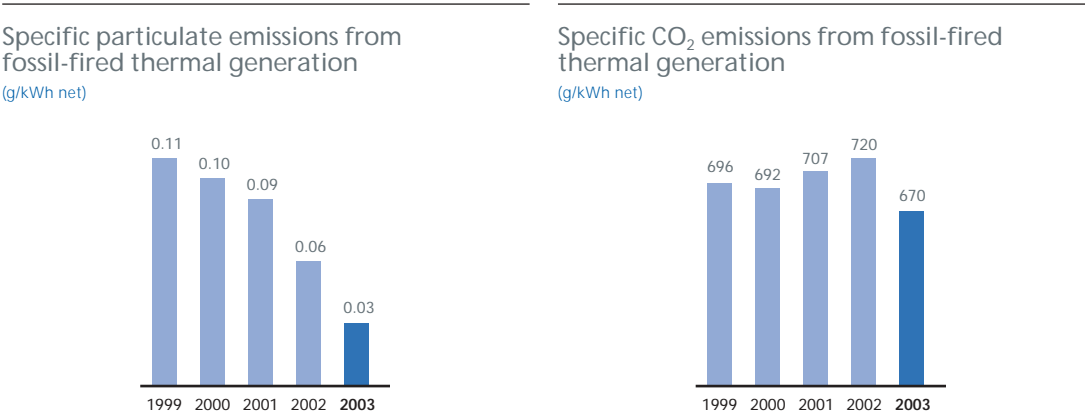
In 2003, the ratio of CO₂ emissions to net fossil-fired thermal generation had the lowest value in the period, thanks to the increase in the average efficiency of thermal plants and to the dominant use of natural gas. In 1990, such ratio was equal to 738 g/kWh.

Specific SO₂ emissions from fossil-fired thermal generation
(g/kWh net)



Specific NO_x emissions from fossil-fired thermal generation
(g/kWh net)





In line with a practice adopted by many electricity companies, specific CO₂ emissions are also determined with reference to total (net) generation of electricity, thereby mirroring also the effect of the overall mix of energy sources.

Also from the latter standpoint, the value of specific CO₂ emissions is the lowest in the period, in spite of the continued decrease of the share of generation from renewables in total electricity generation (in 1990: 618 g/kWh).

Relative SF₆ emissions, which concern all electric activities, express the ratio of the yearly emissions of SF₆ to the volume of SF₆ contained in in-service & in-stock equipment, as well as in the bottles used for replenishment.

Although the percentages of SF₆ over the years show fluctuations (due above all to the occasional character of replenishment jobs), they all lie below the typical value indicated in the 1996 IPCC Guidelines for national greenhouse gas inventories (1%).

The ratio of CH₄ emissions to the total gas wheeled expresses the specific emissions of this gas during distribution.

The reported values are well below those suggested by the 1996 IPCC Guidelines for national greenhouse gas inventories (2.5 to 6.2 g of CH₄ per m³ of natural gas distributed). However, it should be pointed out that the IPCC values refer to all the activities included in natural gas transport and distribution in Western Europe.

Specific releases into water bodies

They express the amount of typical and significant substances (see page 54 - "Releases into water bodies") which are entrained by the share of waste waters of thermal power plants that are returned to water bodies, per kWh net of thermal generation.

As is obvious, these releases are chiefly dependent on the efficiency of waste water treatment systems and cannot be easily correlated with other factors concerning the power plants and their modes of operation.

Specific waste production

Ash is the only waste which has a significant correlation with the volume of activities. As a result, the tables show the production of coal ash (bottom ash and flyash) and of fuel-oil flyash per kWh of the corresponding generation.

The use of better quality fuels (lower production of ash) and the generalized application of advanced particulate collection technologies (higher production of flyash) have opposite effects which are accompanied by fluctuations that depend on contingent circumstances, as previously pointed out with reference to the waste production figures in absolute terms.

Waste recovery

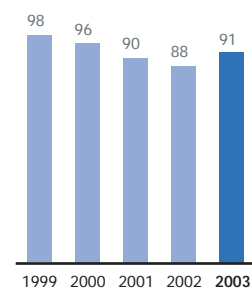
For the main groups of waste, this indicator expresses the ratio of the quantities delivered to recovery operators to the quantities produced.

The trends infer that:

- > recovery of the near totality of coal ash and gypsum remains a well-established practice;
- > recovery of fuel-oil ash, previously reflecting a progressive drop in demand by the markets of recovered materials (heavy metals), had a sustained value in 2003;
- > recovery of "other" non-hazardous and hazardous waste from electricity generation and geothermal drilling was, again, penalized by the need for delivering to disposal facilities most of the exceptional amount of waste resulting from the implementation of the geothermal site rehabilitation plan;
- > recovery of non-hazardous waste and hazardous waste from electricity transmission and distribution (already excellent values for non-hazardous waste and significant values for hazardous waste) rose further in the last year;
- > recovery of non-hazardous and hazardous waste from gas distribution and telecommunications reached excellent levels in 2003.

Total waste recovery

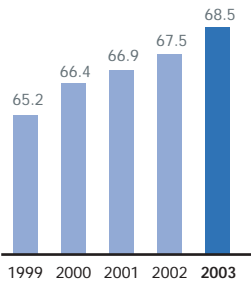
(% of production)



Land

With regard to landscape and land conservation, note the progressive increase in the percentage of overhead and underground cables for low- and medium-voltage lines and, accordingly, the gradual decrease of bare conductors.

Overhead and underground cables
in low- and medium-voltage lines
(% of entire LV and MV grid)



Indicators		%						
		1999	2000	2001	2002	2003	('03-'99)/'99	('03-'02)/'02
Resource conservation and quality								
Net heat rate of fossil-fired thermal generation	kcal/kWh	2,267	2,269	2,279	2,278	2,184	-3.7	-4.2
Net heat rate of geothermal generation	kcal/kWh	5,605	5,534	5,411	5,491	5,324	-5.0	-3.0
Net efficiency of hydro generation from pumped storage	%	72.5	71.4	72.1	71.2	70.7	-2.5	-0.7
Consumption of natural gas for operation of the gas grid	% of natural gas distributed	-	n.a.	n.a.	0.06	0.16	-	169.7
Losses of natural gas along the grid	% of natural gas distributed	-	n.a.	n.a.	0.35	0.35	-	0.0
Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.393	0.352	0.371	0.364	0.407	3.5	11.6
excluding contribution of as-is sea water	liters/kWh	0.304	0.303	0.328	0.309	0.320	5.3	3.7
Coverage of requirements of water for industrial uses								
from rivers	% of requirements	20.6	21.7	24.2	22.0	22.2	7.9	0.9
from wells	% of requirements	24.0	28.2	25.9	18.2	16.5	-31.2	-9.3
from aqueducts	% of requirements	10.2	11.5	12.7	14.5	12.7	24.7	-12.0
from the sea (as is)	% of requirements	22.7	13.8	11.6	15.3	21.3	-5.9	39.5
from the sea (desalinated)	% of requirements	14.8	17.5	18.4	21.9	19.8	33.3	-9.8
from waste waters (used inside plants)	% of requirements	7.6	7.2	7.2	8.0	7.4	-3.5	-8.3
Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	48.5	41.6	38.9	34.1	27.6	-43.0	-18.9
orimulsion	% of total fuel consumption	3.6	5.1	3.9	4.5	4.2	17.1	-7.3
gas-oil	% of total fuel consumption	0.7	0.4	0.3	0.2	0.4	-41.1	68.4
natural gas	% of total fuel consumption	30.7	34.6	33.1	31.7	40.3	31.5	27.1
coal	% of total fuel consumption	16.5	18.2	23.9	29.5	27.4	66.3	-6.9
brown coal	% of total fuel consumption	0.03	0.01	0.00	0.00	0.00	-100.0	-
HS fuel oil	% of total fuel-oil consum.	7.5	1.2	2.0	0.1	0.0	-100.0	-100.0
MS fuel oil	% of total fuel-oil consum.	41.7	41.6	41.1	30.0	1.2	-97.0	-95.8
LS fuel oil	% of total fuel-oil consum.	22.9	30.1	30.4	29.7	35.0	52.8	17.8
VLS fuel oil	% of total fuel-oil consum.	27.9	27.1	26.5	40.2	63.8	128.4	58.5
natural gas, non-technologically captive use	% of tot. natural gas consum.	70.5	72.1	62.5	72.9	41.0	-41.9	-43.8
natural gas, technologically captive use	% of tot. natural gas consum.	29.5	27.9	37.5	27.1	59.0	100.0	118.2
Geothermal steam for electricity generation	% of total geothermal fluid extracted	n.a.	n.a.	n.a.	99.5	99.5	n.a.	0.0
Electricity generation from renewables								
thermal from biogas	% of total generation	-	-	0.016	-	-	-	-
geothermal	% of total generation	2.3	2.4	2.7	3.2	3.7	58.3	14.4
hydro from natural flows	% of total generation	17.5	16.6	17.3	14.9	13.6	-22.6	-8.9
wind & solar (photovoltaic)	% of total generation	0.014	0.013	0.018	0.038	0.056	299.9	45.3
Total	% of total generation	19.8	19.0	20.0	18.1	17.3	-13.0	-4.7
Specific emissions into the atmosphere								
SO ₂ (fossil-fired thermal generation)	g/kWh thermal net	2.9	2.5	2.4	1.9	0.9	-68.0	-49.5
NO _x (fossil-fired thermal generation)	g/kWh thermal net	1.1	0.9	0.8	0.7	0.6	-44.5	-19.0
Particulates (fossil-fired thermal generation)	g/kWh thermal net	0.11	0.10	0.09	0.06	0.03	-71.3	-43.7
H ₂ S (geothermal generation)	g/kWh geothermal net	6.1	6.4	5.9	4.8	4.8	-20.1	0.1
CO ₂ (fossil-fired thermal generation)	g/kWh thermal net	696	692	707	720	670	-3.8	-6.9
	g/kWh total net	533	536	534	550	519	-2.7	-5.7
SF ₆ (electric activities)	% of SF ₆ in stock or in equipment	0.6	0.9	0.8	0.8	0.8	30.7	0.6
CH ₄ (gas distribution)	g/m ³ of nat. gas wheeled	-	n.a.	n.a.	1.8	1.8	-	0.1
Specific releases into water bodies (thermal generation)								
Releases into water bodies (expressed as metal equivalent)	mg/kWh thermal net	n.a.	n.a.	n.a.	n.a.	0.04	n.a.	n.a.
Total nitrogen (expressed as N)	mg/kWh thermal net	n.a.	n.a.	n.a.	n.a.	0.5	n.a.	n.a.
Total phosphorus (expressed as P)	mg/kWh thermal net	n.a.	n.a.	n.a.	n.a.	0.03	n.a.	n.a.
COD	mg/kWh thermal net	n.a.	n.a.	n.a.	n.a.	3.8	n.a.	n.a.
BOD	mg/kWh thermal net	n.a.	n.a.	n.a.	n.a.	0.6	n.a.	n.a.

Indicators

						%	%
						('03-'99)/'99	('03-'02)/'02
		1999	2000	2001	2002	2003	
Specific production of waste							
Coal ash	g/kWh net from coal	41	42	43	43	42	2,2
Fuel-oil flyash	g/kWh net from fuel oil & gas-oil	0,60	0,47	0,31	0,42	0,41	-31,8
Waste recovery							
Coal ash	% of production	106	101	93	94	99	-6,7
bottom ash	% of production	99	99	100	100	100	0,9
flyash	% of production	106	101	93	94	99	-7,1
Gypsum from desulfurization	% of production	99	102	91	94	97	-1,3
Other non-hazardous special waste							
electricity generation & geothermal drilling	% of production	64	60	69	45	47	-26,9
electricity transmission & distribution	% of production	89	95	93	95	100	12,0
gas distribution & telecommunications	% of production	n.a.	n.a.	n.a.	50	96	n.a.
Total	% of production	n.a.	n.a.	n.a.	55	57	n.a.
Total non-hazardous special waste							
electricity generation & geothermal drilling	% of production	100	98	90	89	92	-7,9
electricity transmission & distribution	% of production	89	95	93	95	100	12,0
gas distribution & telecommunications	% of production	n.a.	n.a.	n.a.	50	96	n.a.
Total	% of production	n.a.	n.a.	n.a.	89	92	n.a.
Fuel-oil flyash	% of production	40	16	18	4	8	-79,3
Other hazardous special waste							
electricity generation & geothermal drilling	% of production	41	25	22	14	8	-79,3
electricity transmission & distribution	% of production	82	63	64	68	69	-15,6
gas distribution & telecommunications	% of production	n.a.	n.a.	n.a.	0	95	n.a.
Total	% of production	n.a.	n.a.	n.a.	39	35	n.a.
Total hazardous special waste							
electricity generation & geothermal drilling	% of production	40	18	19	8	8	-79,1
electricity transmission & distribution	% of production	82	63	64	68	69	-15,6
gas distribution & telecommunications	% of production	n.a.	n.a.	n.a.	0	95	n.a.
Total	% of production	n.a.	n.a.	n.a.	23	26	n.a.
Total special waste							
electricity generation & geothermal drilling	% of production	98	96	90	88	91	-7,4
electricity transmission & distribution	% of production	89	93	90	91	94	6,6
gas distribution & telecommunications	% of production	n.a.	n.a.	n.a.	44	96	n.a.
Total	% of production	n.a.	n.a.	n.a.	88	91	n.a.
Land							
LV cable lines							
overhead cable (insulated)	% of entire LV grid	50,4	50,8	51,5	52,1	52,0	3,3
underground cable	% of entire LV grid	29,2	29,8	29,7	29,6	30,4	4,3
Total	% of entire LV grid	79,6	80,6	81,2	81,7	82,5	3,6
MV cable lines							
overhead cable (insulated)	% of entire MV grid	0,68	1,12	1,54	1,88	2,15	214,8
underground cable	% of entire MV grid	33,8	34,8	34,8	35,2	36,1	6,7
Total	% of entire MV grid	34,5	35,9	36,4	37,1	38,3	10,8
Double-circuit 380-kV lines	% of total 380-kV lines	8,7	8,7	8,6	9,2	9,4	8,9

n.a.: not available



Occupational Health & Safety

Protection of workers' health and improvement of workplace safety

Enel is committed to "spread and reinforce a culture of safety, developing an awareness of risks while promoting responsible forms of behavior on the part of all staff members" (Code of Ethics). Occupational health & safety are reiterated in the tenets of Enel's environmental policy, whose strategic targets include the application of the best international practices for the management of safety in the various activities.

Health & safety in workplaces are an integral part of Enel's culture and industrial policy and their implementation actively involves all workers, as well as their representatives.

This commitment translates into actions on various fronts:

- > awareness, education & training of employees;
- > continuous updating of risk assessment documents;
- > application of occupational health & safety systems conforming to the international OHSAS 18001 specification.

Organization

The Corporate Personnel & Organization, Health & Safety, Regulations and Industrial Relations Unit has the mission of issuing guidelines for the homogenous application of occupational health & safety regulations throughout Enel.

The organization of these activities is described in a corporate document (issued in 1997, updated in 2000 and under revision in 2003), which is used as a reference by all the units of Enel that are responsible for health & safety.

In all of Enel's sites, the so-called "Production Units" as well as their hierarchical and functional organization (employer, manager, controller) have been identified since 1997. At the same time, within each Production Unit, Enel also created the Prevention and Protection Service, appointing its Manager and the Physicians in charge of health surveillance and risk monitoring.

It goes without saying that any organizational change within Enel requires an adaptation of its health & safety organization.

The human resources that are permanently or partially dedicated to health & safety in workplaces amount to over 350 equivalent full-time units.

Awareness, training & education

In 2003, Enel delivered about 260,000 hours of training & education courses on health & safety at work. These are, in practice, continuing education initiatives, which are intended for electrical equipment workers and are focused on correct working practices and methods for mitigating the risk of accidents. Enel also continued the delivery of training courses for the positions specified in Legislative Decrees no. 626/94 (prevention and protection manager and staff, emergency team, workers' safety & health representative) and no. 494/96 on the safety of temporary and mobile construction sites (design coordinator, site management coordinator).

As regards office work, employees participate in yearly programs aimed at making them aware of the

related risks (use of display screens, etc.) and of the procedures included in the emergency plans of the individual industrial sites and offices.

Expenditure

Also for 2003, only the most significant items of current expenditure are reported under the following macro-categories:

- > awareness, training & education;
- > health surveillance (appointment of the physician in charge, creation of health facilities, periodical medical examinations, etc.);
- > personnel dedicated to health & safety;
- > individual protection systems;
- > specialist studies and research (participation in national and international projects concerning health & safety, epidemiological studies, analysis of the trend of injuries).

The above categories of expenditure amounted to 32 million euro.

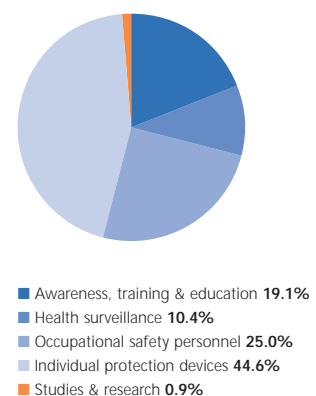
The "awareness, training & education" category also embodies the activities listed in Legislative Decrees no. 626/94 and no. 494/96, i.e. training of workers' health & safety representatives, prevention and protection managers and staff, emergency team, design and site management coordinators.

Investments in safety & health – most of which are part of programs of reorganization, renovation or retrofitting of office and/or plant sites for compliance with the relevant legislation

– are not reported, owing to the difficulty of identifying them among overall investments.

Nevertheless, it is worth emphasizing that such investments always result into an improvement of the general conditions of health & safety in workplaces.

Main items of current expenditure
Total: 32 million euro



Initiatives

In the course of 2003, Enel undertook efforts to mitigate risks in workplaces. These efforts, which are also based on findings from focused studies & research, are complementary to specific prevention and protection measures adopted in the individual working environments.

In particular:

- > the Generation and Energy Management Division formulated an action plan; the plan provides for greater involvement of the personnel (especially manual workers) in the definition and implementation of prevention measures, as well as for closer and closer cooperation with

- contractors on awareness of risks in power plant sites and on related prevention and protection measures, including the training of their personnel;
- > also the Networks, Infrastructure and Sales Divisions set the target of minimizing the injuries of their own personnel and of their contractors'/suppliers' personnel; this target is pursued through specific education & training courses to be delivered from 2004 to 2006; the courses are mainly intended for Enel's personnel in charge of supervising construction sites and for those who will conduct audits and inspections on contracted-out work in order to verify the adequacy of safety management provisions; with regard to third parties' injuries arising from improper behaviors in or around Enel's industrial sites, awareness campaigns will be organized for the most representative associations of sport fishing and of the construction industry;
 - > with a view to further improving workplace hygiene, safety and security in the Networks, Infrastructure and Sales Divisions, major investments are planned (from 2004 to 2006) in the buildings which are used as offices, warehouses or sites of field teams (total investments: 15 million euro);
 - > Terna obtained the ISO 9002 (now Vision 2000) certification for its quality assurance system, which involves, among others, health & safety aspects; in the next three-year period, working procedures and methods will be periodically revised, also in view of regulatory evolution, and work-related accident awareness and mitigation actions will be initiated;
 - > in the next three years, with a view to maintaining its OHSAS 18001 health & safety management system certification, Wind plans awareness actions for its employees as well as for its partners, also by auditing and monitoring their health & safety organizations;
 - > in line with recent regulatory developments, Enelpower revised its guidelines for health & safety in construction sites (Legislative Decree no. 494 of 1996) and for the formulation of health & safety and coordination plans, by developing specific courses for design and construction-site management personnel;
 - > in the course of 2003, at the request of external companies, such as Endesa Italia and Sogin, Enel coordinated the preparation of the new edition of the Memorandum of Understanding on prevention of electric risks upon maintenance of cross-border elements of the grid and of elements with mutual interference; the new edition also laid down rules to be followed upon the testing of power installations.

The process of OHSAS certification of working environments and procedures, started in 2002, now covers about 64% of Enel's sites. The certification process of the Generation and Energy Management Division is at an advanced stage; with the completion of the process, expected by 2006, OHSAS-certified sites will cover over 80% of Enel's workforce.

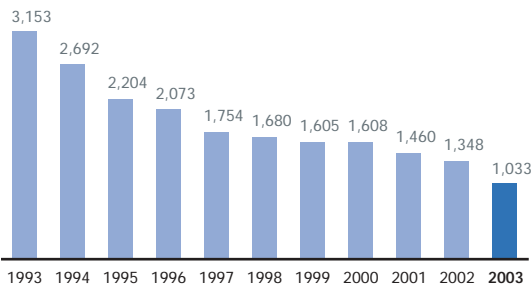
Injuries

In 2003, the total number of occupational injuries continued to drop significantly. For the first time since 1963, the frequency rate fell below 10 (9.7).

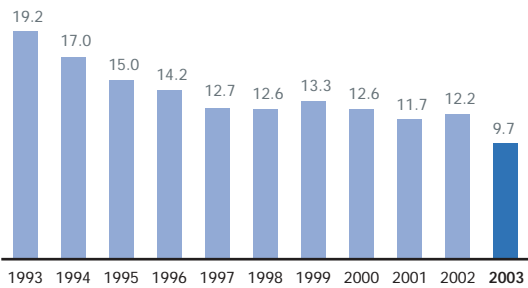
In the year, 6 serious injuries and 4 fatal injuries were recorded; of these, three were due to road accidents during working hours and one to collision with moving objects. The most recurrent causes of serious and fatal injuries in 1999-2003 were electrocution and falling from elevated areas.

Finally, in spite of its general downward trend, the number of serious and fatal injuries of contractors' personnel in 2003 remained significant (37).

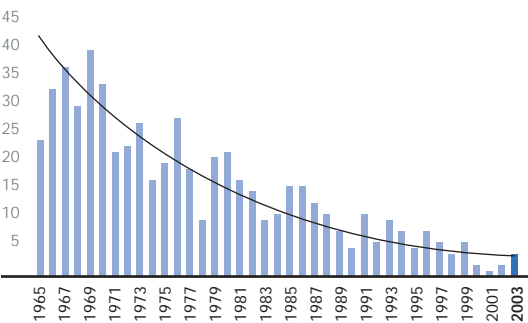
Number of injuries involving at least one day of absence from work*



Number of injuries per million hours of work (frequency rate)

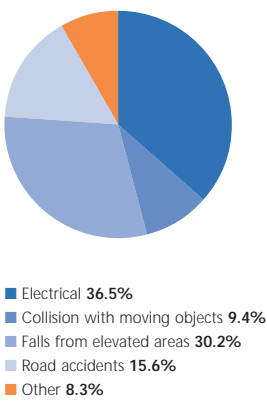


Fatal injuries*
(no.)



* In the reported period Enel's personnel progressively decreased.

Serious and fatal injuries from 1999 to 2003
Total: 96





Certification Report



The IT Group Infrastructure & Environmental Italia Srl

Piazza Duca d'Aosta 12
20124 Milano
Tel. 02/673.390.1 (centralino)
Fax 02/673.390.99



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Rome, May 20th, 2004

Verification of Enel SpA's 2003 Environmental Report

Enel SpA asked The IT Group Infrastructure & Environmental Italia Srl to verify its Environmental Report for 2003. The following statement provides the reader with the results of such verification.

Our approach to the verification activity was largely based on the guidelines issued by the "Forum on certification of environmental reports", which was held at Fondazione Eni Enrico Mattei.

We reviewed the Report, as well as the activities and procedures for collection and aggregation of the reported data, in order to determine whether:

- the Report was complete and included all the aspects and significant impacts of Enel's activities;
- the Report was understandable and clear;
- the system used for data collection and aggregation was adequate and reliable;
- appropriate evidence was available that Enel's individual companies and divisions had gathered and reported the data in homogeneous and correct ways.

Our verification covered all the parts and contents of the Report, as well as the modes of collection and aggregation of the data, from their provision by Enel's individual companies and divisions - and by their peripheral sites - to final data presentation in the Report. We sample-checked the reported data by conducting audits at:

A – Generation and Energy Management Division

Thermal Generation Business Area

Headquarters (Rome)

TORRE NORD Business Unit

LA CASELLA Business Unit

MONTALTO Business Unit

LA SPEZIA Business Unit

SANTA BARBARA Business Unit

BASTARDO Business Unit

Renewables Business Area

BOLOGNA Business Unit (large hydro plants)

CEPRANO Business Unit (alternative sources)

TRENTO Business Unit (large hydro plants)

Geothermal Business Unit – Headquarters (Pisa)

Geothermal Business Unit – LARDERELLO plants

B – Networks and Infrastructure Division

Power Grid Business Area

Headquarters (Rome)

Lazio Abruzzo and Molise Grid Regional Unit

Gas Grid Business Area

Headquarters (Milan)

C – International Division

Headquarters (Rome)

D – Telecommunications Division

Headquarters (Rome)

E – Terna SpA

Headquarters (Rome)

Firenze Transmission Field Unit

At the Corporate Public and Regulatory Affairs, Environmental Policies Unit, which is responsible for the preparation of the Report, we carried out general verifications on data management, by sample-checking the data coming from the various Divisions and Companies and assessing the reliability of the data collection system. We also sample-checked the reliability and consistency of the data.

At the peripheral sites of the various Divisions and Companies, we conducted our audits in accordance with ASTM (E 1527 – 97) standards, involving document analyses, interviews with the personnel in charge of the various activities and gathering of visual evidence. The data were gathered in a uniform way throughout Enel according to a standard format for presentation of the data in the Report.

Enel's system of data collection and management is still based in part on operator-dependent manual data entry. Nevertheless, it proved to be reliable and accurate in consolidating the data, enabling us to check their consistency and facilitating our work.

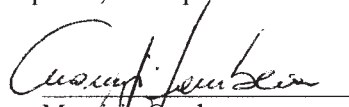
The set of data collection, management and processing activities that are in place at Enel represent a sound Information System for accounting Health, Safety and Environment data and making the related outputs reliable and verifiable.

However, for the future, we express the recommendation that we formulated in 2002, i.e. to extend the automatic environmental data and performance management information system to all the parts of Enel where such system is not yet in place, also with a view to providing a uniform and constant flow of data.

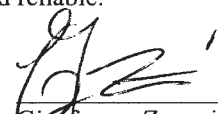
The format of the Report is clear and reader-friendly and we can state that it is in line with the most advanced and innovative international standards in this area.

The Report is complete, clear and understandable. The performance indicators and the data are correctly reported.

In our opinion, Enel SpA's 2003 Environmental Report is complete, understandable and reliable.



Maurizio Gambera
Manager, Italian Operations



Gianfranco Zanoni
Senior Consultant

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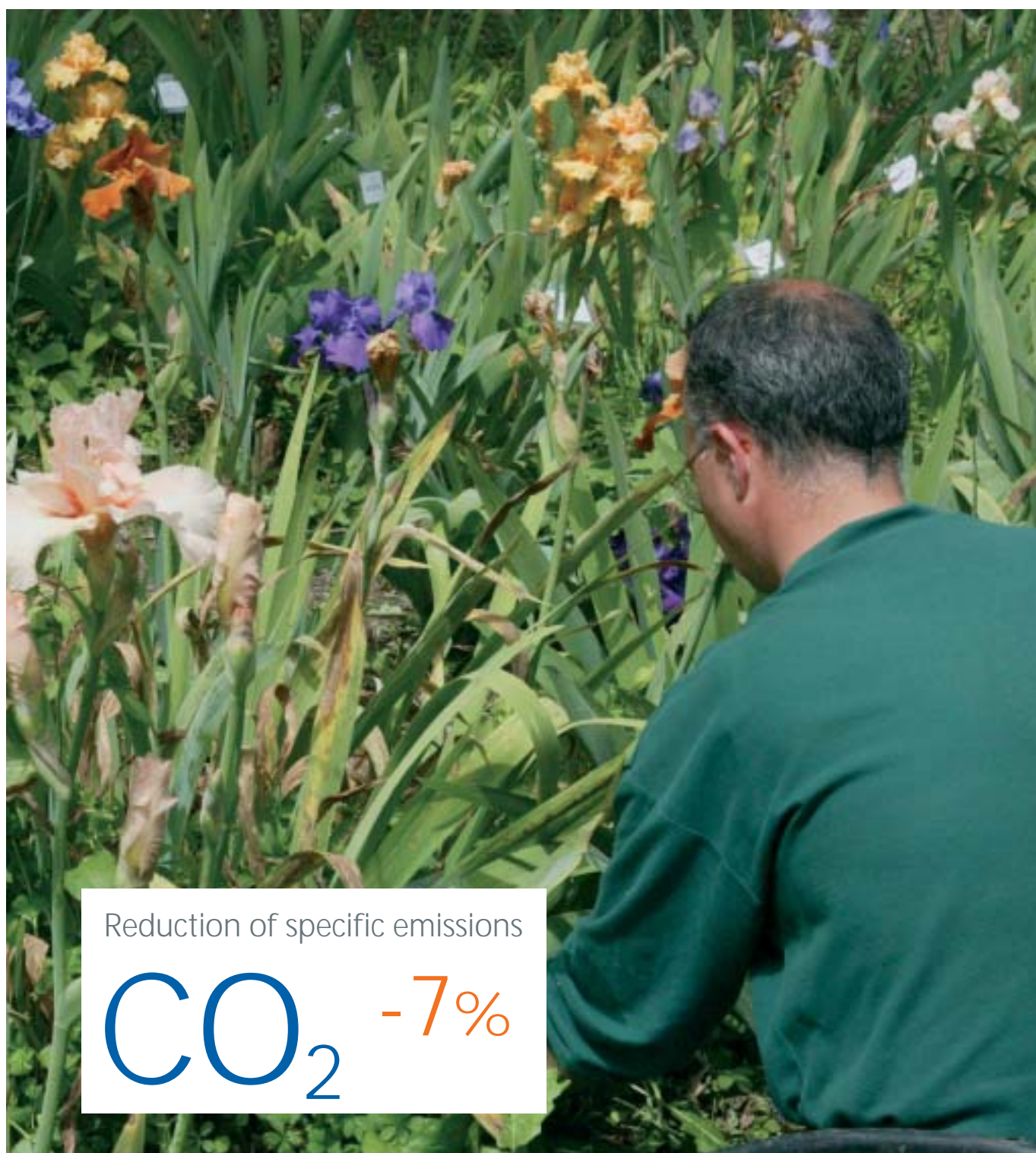
Certified capacity

51% ISO 14001



Registered capacity

27% EMAS



Reduction of specific emissions

CO_2 -7%

