



2000

Environmental Report



2000

Environmental Report



Table of Contents

Chairman's message	5
Enel works for the environment	6
The environmental policy of the Enel Group	25
Environment and Safety within the Enel Group	
Organization	28
Instruments	29
- <i>Voluntary agreements</i>	29
- <i>Management schemes</i>	30
- <i>Reporting</i>	31
- <i>Awareness, training & education</i>	31
Economic resources	32
- <i>Environment</i>	32
- <i>Safety & health</i>	33
Main Environmental Results	
Energy efficiency	36
Deployment of renewables	37
Reduction of emissions	39
Rational use of water	42
Integrated waste management	43
Rationalization of the power grid	45
Initiatives for the application of the Kyoto Protocol mechanisms	48
Eco-Balance and Indicators	
The eco-balance	52
Notes to the eco-balance	57
- <i>Resources</i>	57
- <i>Process and product</i>	58
- <i>Emissions</i>	59
Indicators	62
Occupational Health & Safety	
Initiatives for risk prevention, health protection and workplace hygiene	71
Protection and promotion of occupational health	72
Injuries	73
Companies of the Enel Group	
Data sheets of the Group's companies	77
Verifier's Statement	



In 1996, when we issued our first Environmental Report, we used it as a compass to find the proper course. Today, in 2001, we are aware that we are actually on track. The situation has deeply changed. Enel made decisive choices not only to improve the quality of life of people, but also to produce energy in more efficient and environmentally sustainable ways.

Publishing our Environmental Report is an opportunity to take stock of what we have done during the year and to set more challenging goals for the future.

The concreteness and completeness of our 1999 Environmental Report, as a fundamental tool for giving full account of Enel's environmental activities, earned us a special reward for financial statements and communications ("Oscar di Bilancio").

In 2000, Enel continued its efforts to curb emissions of pollutants, through continuous improvement of the operation of its installations, investments in the conversion of some of its power plants to combined cycles, and enhanced efficiency of its thermal power plants. One of the most significant developments in 2000 was the signature of a Voluntary Agreement between Enel and the Ministries of the Environment and of Production Activities. Under the Agreement, Enel undertook to drive down its CO₂ emissions by 13.5% by 2002 and by 20% by 2006. This is currently the most substantial Italian protocol on greenhouse gas emission reduction.

In the past five years, we had very good results in terms of polluting emissions: we slashed SO₂, NO_x and particulates by 34%, 52% and 64%, respectively. Our recovery of waste remained very high; hitting 100% for gypsum and coal ash.

We achieved equally positive results in the environmental management of our power generation sites, which were audited as part of the ISO 14001 and EMAS certification processes. In 2000, the number of power plants that gained the EMAS logo as being environmentally friendly rose to 6 and, within 2005, we plan to certify 100% of our installed capacity.

One of the key areas where we focused our attention in 2000 was the increased use of clean and renewable energy sources. In 1999, with this mission in mind, we set up Erga, a company of the Group specializing in renewable, geothermal and alternative energy sources. Now, after its entry into the US market, the company has become no. 1 in the world for electricity generation entirely from renewables.

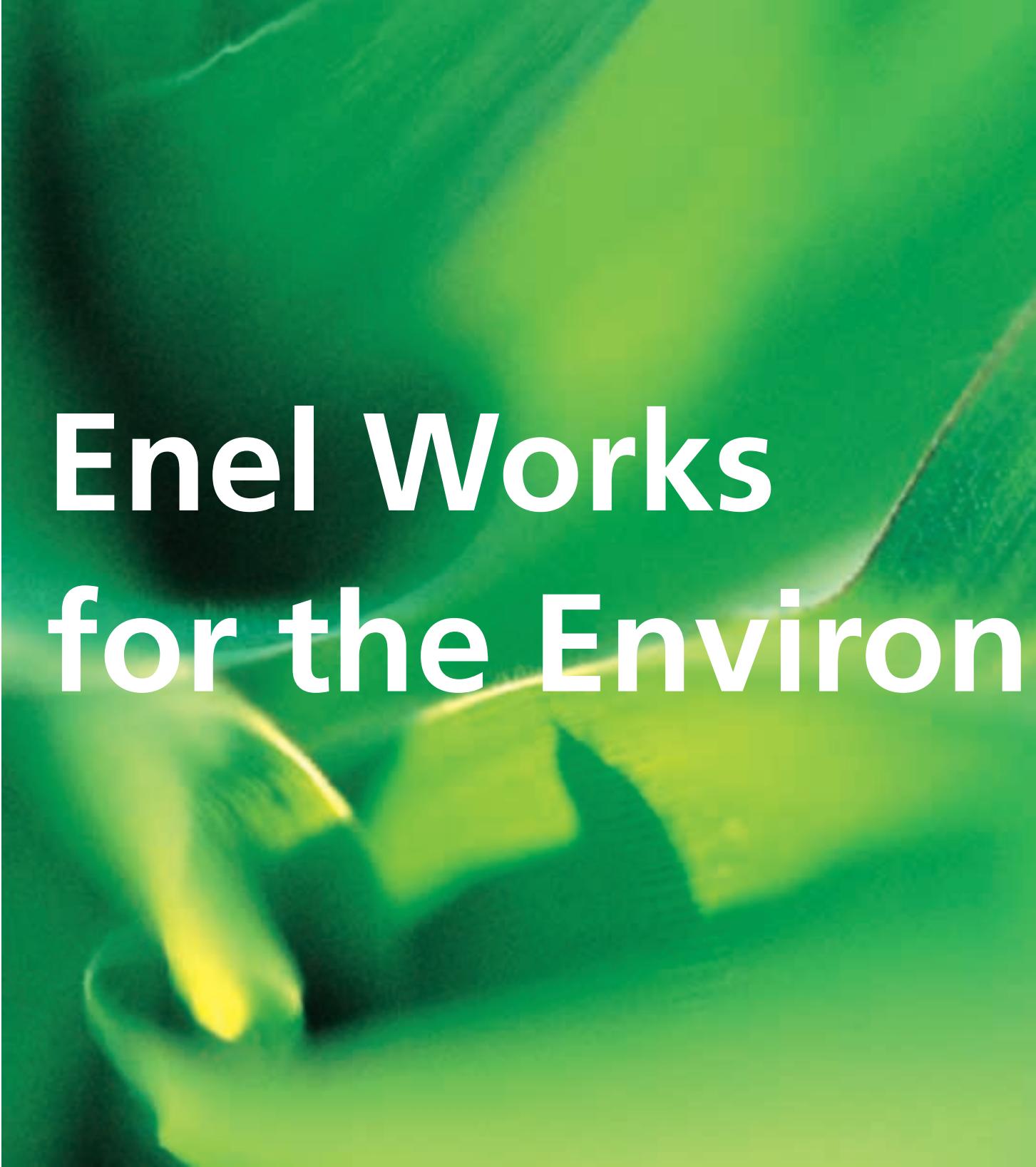
Among Enel's environmental highlights, it is worth mentioning the better integration of the power grid into the natural and urban environment: we undergrounded about 45,000 kilometers of medium- and low-voltage lines from 1996 to 2000, and we built about 32,000 kilometers of medium- and low-voltage lines with overhead insulated cables, a technology which does not interfere with the natural growth of vegetation.

Our performance from 1996 to date, in terms of environmental improvement of power generation sites and energy efficiency in end uses, testifies that it is feasible and imperative to reconcile rational energy use with protection of the natural environment.

Electricity is an increasingly safe and clean source for industry and people and one of the mainstays of our country's sustainable development.

Enel's Chairman

Chicco Testa



Enel Works for the Environment



ment

**2000 environmental
highlights
of the Enel Group.**



Cutting of 20% of carbon dioxide emissions by 2006

Committed to a Healthy Climate

**The voluntary
Agreement signed on
July 20, 2000 between
Enel and the Environment
and Industry Ministries
is so far the most
important Italian protocol
on greenhouse gas
emission reductions.**

The Enel Group voluntarily agreed to cut its carbon dioxide emissions per kWh generated by 13.5% by 2002 and by 20% by 2006. This is tantamount to saying that, power generation remaining equal, Enel will curb its CO₂ emissions by 15 and 22 million tons from their levels in 1990, the base year specified in the Kyoto Protocol. The voluntary Agreement which was signed on July 20, 2000 by Enel and the Environment and Industry Ministries stands as the currently most important Italian protocol on greenhouse gas emission reductions. Attainment of this challenging target will require a wide array of actions which will involve all the companies of the Group.

The Agreement presents a flexible menu of options, from which Enel may from time to time select the most efficient emission cutting initiatives. Chief among these options: increase of energy and

environmental efficiency in thermal generation; deployment of power generation from renewables; reduction of losses on the distribution grid; improved efficiency in end uses.

Under the Agreement, also the Ministries made specific commitments, such as: assigning to Enel emission reduction targets that are consistent with those laid down in the Agreement and in line with the relevant national pledges; enabling Enel to flexibly operate its thermal power plants while meeting its overall CO₂ emission targets; authorizing Emissions Trading at the national level between the various sectors (and also within the Enel Group) and on the global scale; fostering and supporting emission reduction projects; assigning emission credits to Enel for the implementation of projects involving indirect CO₂ reductions. As set forth in the Kyoto Protocol and as advocated by the European Union, other key instruments of the Agreement are the implementation of international projects (Joint Implementation and Clean Development Mechanism) and the exchange of emission allowances (Emissions Trading).

Renewables

Erga, the World's Number One

Erga's entree into the overseas market through the acquisition of CHI Energy and Energia Global International. In Italy, another 800 MW of green power.

Erga (Energie Rinnovabili Geotermiche e Alternative - Renewable, Geothermal and Alternative Sources), the company of the Enel Group specializing in power generation from renewable sources has acquired CHI Energy, the first US independent producer of power from renewables, and Energia Global International Ltd. (EGI), an alternative energy company operating in Central and South America.

With this deal, Erga becomes the world's top producer of electricity entirely from renewable sources, with an overall installed capacity of over 2,000 MW and with power plants operating in Italy, the US and Canada. The company's blueprint for Italy in the next five years includes another 800 MW of capacity from hydro, geothermal and wind power plants.



Eco-recharger at the Vatican

So.l.e., a company of the Enel Group, donated to the Vatican City one of its environmentally-friendly battery-recharging posts ("Biberon", literally feeding bottle) for electric vehicles. The electric vehicle refueling system, placed in the parking area of the Nervi Hall (the Pope's public audience hall), can recharge the electric vehicles of the Holy See, as well as the wheeling chairs of disabled pilgrims visiting Saint Peter's.





La Spezia Plant Goes Gas

Conversion of two of the power plant's generation units to combined cycles. Considerable advantages in terms of energy efficiency and environmental protection.

efficiency of the plant, cutting emissions of nitrogen oxides by over 80% and practically zeroing those of sulfur dioxide and particulates.

The works carried out in the La Spezia plant are part of an extensive program to be completed by 2006. With an investment of 10,000 billion lire (about 5,000 billion euros), 18 power plants of the Enel Group (total installed capacity: 15,000 MW) will be converted to combined cycles. At the end of the program, the efficiency of the totality of Enel's thermal power plants will climb from 38% to 45%, dramatically reducing emissions into the atmosphere.

Two generating units of the La Spezia thermal plant (power rating of 310 and 325 MW, respectively), fueled by coal and oil, were converted to gas-fired combined cycles through the installation of gas turbines and recovery boilers. The resulting advantages from the standpoint of energy efficiency and environmental protection are substantial: increased

Enel Waste Recovery Nears 100%

In 2000, the Enel Group recovered 96% of its total hazardous and non-hazardous waste, hitting 100% for gypsum and coal ash.



Information in the electricity bills of 20 million Italian households

Enlightened with Common Sense

Enel promotes lighting efficiency among its residential customers. 10,000 eco-friendly bulbs distributed.

"Enlightened with common sense" is the slogan of an aggressive promotional campaign that Enel Distribuzione launched for the dissemination of high energy efficiency bulbs. In their bills, 20 million Italian residential customers received guidance on rational use of electricity. Thousands of leaflets and posters were also distributed at Enel's front offices. Ten thousand customers of Enel Distribuzione, selected by drawing of lots, received as many bulbs which consume 80% less energy.

The campaign took off in the Spring of 2001, also as a result of the commitment to energy efficiency in end uses that Enel made under its voluntary Agreement on greenhouse gas emission reduction with the Environment and Industry Ministries. If Italian citizens replaced one million ordinary bulbs with as many compact fluorescent bulbs (having a high energy efficiency), then the yearly emissions of carbon dioxide would be slashed by 400,000 tons.



Award for Environmental Communication



In 2000, Enel earned an award for its 1999 Eco-Balance. The recognition is part of the "Oscar di Bilancio" system of awards for financial statements and communications. The jury praised Enel's 1999 Eco-Balance for its transparency, readability, completeness of data and statistical & graphic documentation, as well as for the quality of its environmental reporting, its effectiveness in communication to stakeholders, its timeliness and modes of presentation to the media. The award, created in 1954 by Istituto per le Relazioni Pubbliche (Public Relations Institute) and sponsored by Federazione Relazioni Pubbliche Italiana (FERPI, Italian Public Relations Federation), is given to enterprises whose balance-sheets achieve the best corporate communication in Italy.

Monte Arci Wind Power Plant Takes Wing

**Erga inaugurates
in Sardinia one of Italy's
most important
wind power plants.**

Erga inaugurated one of the most important Italian wind power plants. The plant is located on the plateau of Monte Arci (elevation: 800 m) in Sardinia, a region where Enel intends to intensify its renewable-power generation activities. The plant includes 34 wind generators capable of producing 14 million kWh per year, which will be directly injected into the power grid.

In-depth environmental and land-use studies made it possible to integrate the plant inside the Monte Arci Natural Park. In Italy, Erga has 3 wind farms (totaling 25 MW) in operation, 4 wind farms (25 MW) at an advanced stage of construction, and signed agreements for another 21 wind farms totaling 270 MW.



Environmental Rehabilitation of Geothermal Sites



Erga launched an impressive plan of environmental restoration of the areas affected by past geothermal activities.

The plan will be implemented mainly in the Tuscany Region from 2001 to 2006 and will require an overall investment of approximately 42 billion lire (about 22 million euros). The plan, which was agreed with interested municipal authorities, is focused on the technological and environmental quality of new projects and includes the closing of no longer used geothermal wells (accompanied by the environmental restoration of the sites), dismantling of decommissioned plants, removal of asbestos-containing materials, reuse or disposal of drill cuttings.

Cutting air pollution beyond compliance

Bluer Skies

Enel curbs emissions of sulfur dioxide (-12%), particulates (-11%) and nitrogen oxides (-11%). Growing use of natural gas for power generation.

were achieved through the installation of a higher number of flue gas desulfurization and denitification systems, the retrofit of combustion systems, the growing use of natural gas and of low-sulfur oil, in addition to a program for improving the efficiency of power plants. The 2000 data, together with the positive results obtained in previous years, give evidence that Enel's performance in terms of emission reductions goes far beyond the environmental compliance targets mandated by legislation.

Curbing emissions into the atmosphere continues to be high on Enel's agenda. In 2000, the company lowered sulfur dioxide (SO_2) by 12%, nitrogen oxides (NO_x) and particulates by 11% as compared with the previous year.

The emission cuts



"Clean" Glass at Murano

Enel Distribuzione donated an innovative, all-electric and zero-emission furnace to the Murano Glassmaking School.



In April 2001, Enel Distribuzione donated a new power-driven melting furnace to the Murano Glassmaking School.

The high-efficiency furnace (potential output: 150 kilos of glass per day) can zero local emissions of pollutants, which is very important because glassmaking laboratories are often located in built-up areas. The furnace has a very low heat rate with respect to gas furnaces (i.e. as little as 3.5 kWh per kilogram of glass produced), thus cutting down carbon dioxide emissions by 42%.

The furnace is part of a cooperative program between Enel-Cesi and the Murano Experimental Glass Station, which will lead to a new process of melting and production of artistic glass.

Latest EMAS registration: Torrevaldaliga Nord power plant

EMAS: Enel Tops Italian Ranks



Six of Enel's power plants have already been awarded the logo of the European Eco-Management and Audit Scheme.

Enel achieved the EMAS registration also for its thermal power plant of Torrevaldaliga Nord, which is the largest power generation site in Italy, with an installed capacity of 2,600 MW.

The number of Enel's sites certified for their environmental management systems thus rises to 6, out of 41 total EMAS registrations released in Italy. In addition,

twelve of Enel's sites are certified under ISO 14001.

The sites which gained the EMAS credentials are the thermal plants of La Casella, Torrevaldaliga Nord, Tavazzano, Turbigo, Torrevaldaliga Sud and the hydro plants of the Cordevole valley. Furthermore, in the course of 2000 and in early 2001, the following sites were ISO-certified and are awaiting the EMAS registration: the thermal plants of Fusina, Monfalcone, Porto Marghera, Porto Tolle, Sulcis and the hydro plants on the Avisio river.

The Enel Group continues to work towards its voluntary target of registering 100% of its installed capacity under the EMAS Regulation by 2005.

Activities also within the framework of E7

Global Accords for CO₂



In accordance with the Kyoto Protocol, the Enel Group is very active in cooperation activities for lowering greenhouse gas emissions.

Enel is deeply engaged in cooperation activities for lowering greenhouse gas emissions, as set forth in the Kyoto Protocol. The company believes that greenhouse gas reduction targets can be pursued in cost-effective ways through Joint Implementation (JI), Clean Development Mechanism (CDM) and Emissions Trading (ET). In 2000, ENEL participated in GETS (Greenhouse

Power Grid Certification

Go-ahead for Terna's Environmental Management System project.

Terna - a company of the Enel Group which owns the electricity transmission grid - started a project for implementing an Environmental Management System for its infrastructures.

The project will consist of actions to achieve the ISO 14001 certification for a portion of the national transmission grid, including some transforming stations.

At a later stage, Terna will also put in place procedures for registering the same portion of the grid under EMAS. In this way, Terna will become the first European operator with electricity transmission assets certified under the new European Regulation.



Reduction

Gas & Electricity Trading Simulation), an initiative taken by Eurelectric to simulate the trading of CO₂ emission permits.

Enel also joined EMDG (Emissions Market Development Group), which has the objective of creating "universal" credits which may be exchanged on a trading platform.

Within the framework of the E7 Group, Enel completed two projects (one in Jordan and one in Indonesia), through which our country may acquire CO₂ credits. The Jordanian project improved the efficiency of an existing thermal power plant, whereas the Indonesian one harnessed renewables for rural electrification in a province of the Timor island.

Together with the main Italian operators in the electricity industry, Enel takes part in RECS (Renewable Energy Certificates System), an initiative which gathers fifteen other countries.

At the end of 2000, Enel began a nationwide process of consultation with other industrial sectors and their associations, with a view to investigating the feasibility of an Italian Emissions Trading system. The system is expected to be incorporated into the European process that the European Commission initiated in March 2000 with its Green Paper. Participants in the consultation are electricity, petroleum, chemicals, paper, cement, steel and glass industries, as well as the Environment and Industry Ministries.

Rome and Florence

The Mobility Manager Is Here

Starting in 2000, also Enel will rely on an in-house mobility manager for its Rome offices with over 300 employees. The initiative is part of the "Together to Work" project, prepared by the Municipality of Rome within the framework of one of the current European programs. The project is designed to optimize home-to-office commuting and thus help improve traffic conditions and reduce urban pollution. In Florence, an agreement between Enel Distribuzione's mobility manager and municipal authorities gave rise to a new line for mass transit between the Campo di Marte railway station and Enel's premises of Lungarno Colombo.

In-house mobility managers have the task of building awareness of mobility issues and of spurring employees to switch from private cars to more cost-effective modes of mass transit.



On some of its cars, Enel started experimenting Supertech, a device that is installed in the fuel tank and expected to cut the consumption of fuel and the emission of pollutants.

The results of this pilot project will be available by the end of 2001.

Lake Como Heats Villa Olmo

Enel implemented an innovative project for efficient cooling/heating of the 18th-century villa.

Villa Olmo, a prestigious 18th-century villa of Como, will be cooled and heated in environmentally-benign way thanks to a project of Enel.

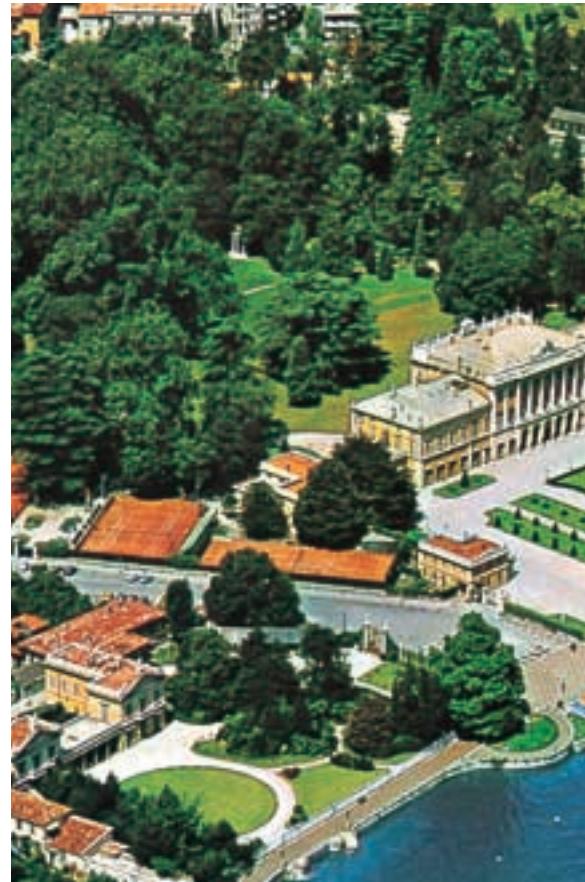
An innovative system of reversible power-driven heat pumps (similar to commercial air conditioning systems), using the water from the lake as a thermal source, will heat the wide and sensitive premises of the castle.

Underground pipes will withdraw water from the lake, at a depth of about 7 m, where temperature is

practically constant around 7°C in any season. After a heat exchange process, the system will return the water to the lake with a moderate temperature variation (about 4°C) and without any chemical alteration.

Replacement of gas-oil boilers with power-driven heat pumps will have a two-fold advantage: i) energy savings and environmental protection through the reduction of primary energy consumption by 50%, of greenhouse gas emissions by 62% and the zeroing of local nitrogen oxide emissions; ii) cost cutting through reduction of operating costs by 35% and payback of the investment in about 5 years.

The pilot system installed in Como received a nomination by the jury of the Italian "Environmentally-Friendly Innovation" award.



Enel Produzione's restyling program

A Power Plant Blends with the Landscape

Lines and colors matching with the surrounding environment.

The first installation will be the power plant of La Casella, near Piacenza. Then, the program will be extended to other plants, beginning with the Porto Corsini one, in Ravenna. The goal: harmonizing Enel Produzione's plants with the landscape, by changing the lines and colors of their central buildings, interiors and surrounding areas.

Most of the typicall white-&-red-striped chimney-stacks will be re-painted in light colors, and boilers will be covered with panels to soften their lines and smooth their colors, using innovative materials, such as "lexan".



First ISO 14001 certification awarded to an Italian wireless operator for its environmental management system

WIND for the Environment

WIND is the first mobile-telephony operator in Italy - and among the first in Europe - which acquired the ISO 14001 certification for its environmental management system. Earning this prestigious recognition means making rigorous choices in terms of system design, installation and

operation, with a view to controlling electromagnetic emissions, better protecting the environment, mitigating the visual impact of aerials, correctly managing waste streams and saving energy.



Voluntary commitment

Protecting Bonifacio Strait

The sensitive passage between Sardinia and Corsica will be off-limits for the ships of Enel.FTL's suppliers.

The Strait of Bonifacio - and its vulnerable marine ecosystem - will be off-limits for Enel.FTL's suppliers.

Enel.FTL, a company of the Enel Group engaged in fuel procurement, has introduced special clauses in its contracts with suppliers, requiring that their ships do not pass through the Strait of Bonifacio.

The Strait represents one of the most valued areas of the Mediterranean sea and one of the ecosystems most threatened by oil pollution. Every year, more than 100,000 tankers of every nationality cross the Mediterranean sea: 5,000 of them pass through the Bonifacio Strait; on average, one ship every 2 hours. Any problem, even of small extent, arising in this narrow passage (often swept by strong gusts of mistral), may turn into an environmental disaster.

Voluntary commitments made by large energy companies can help change attitudes that are detrimental to the environment.

To increase the environmental safety of its maritime transport, Enel.FTL uses carefully inspected ships not exceeding 25 years of age.



All over Italy

Enel Distribuzione's Conse

**9,000 km of new underground power lines.
5,700 km of low-voltage bare conductors demolished.**

and used underground cables for building 9,000 km of low- and medium-voltage lines. Another 4,700 km of low- and medium-voltage lines were installed using overhead insulated cables. These cables represent a new technology that does not interfere with the avian fauna and with the natural growth of vegetation, that eliminates electric fields and radically reduces magnetic ones.

Enel Distribuzione's most significant environmental actions in 2000 were concentrated on protected areas, which now cover almost 10% of the country.

In 2000, Enel Distribuzione went on with the program of rationalization of its power lines, also with a view to better integrating them into the landscape and the environment. Throughout Italy, the company removed 5,700 km of bare conductors on low-voltage power lines



Fire Prevention Camera at Pollino National Park



Cameras on power line towers for early warning of fires: this is a pilot scheme that Terna is implementing in the Pollino Park under a Memorandum of Understanding with the Environment Ministry, Federparchi (the Italian Federation of Parks and Nature Reserves) and Legambiente (an Italian environmental association).

The remote sensing system mounted on Terna's infrastructures will monitor a very extensive area located in the southern part of the park.

Environmental Education at Castel Giubileo

The Tiber seen from the hydro power plant. Bird viewing site also created.

An environmental and fluvial education center was created near Enel Produzione's hydro power plant of Castel Giubileo. The plant was built on the Tiber river, in the metropolitan area of Rome, in 1951. It delivers zero-emission electricity to 12 thousand households. The educational center, erected in the wide green area facing the plant, has a bird viewing site and is run by Legambiente in tandem with Enel. The center is expected to enhance the value of the river as a nature and wildlife area, as well as its role of energy source for power generation. The center will offer documentation, host exhibitions and serve as a departing point for riverside walks along a nature trail. The initiative is part of Enel's program "Nature and Land", which is targeted to raise the environmental, tourist and recreational profile of the areas adjoining its power plants.



rvation Efforts



Deployment of renewables in protected natural areas

Partnering the Parks

Agreement between Enel, the Environment Ministry, Legambiente and the Italian Federation of Parks.

and the Italian Federation of Parks and Nature Reserves.

The Memorandum identifies parks not only as areas of conservation of natural (and often historical-artistic) heritage, but also as drivers of new activities that are more responsive to quality-of-life needs and more friendly to the environment.

Parks will become demo sites for experimenting, developing and deploying renewable energy sources (the only ones that are globally sustainable in the long term) and for pursuing land conservation initiatives also through the progressive reduction of the impact on the environment, especially on watercourses.

Parks are thus a novel instrument for coordinating and developing policies of conservation of protected areas, which capitalizes on the activities that Enel has initiated in previous years as part of its "Nature and Land" program.

Deployment of renewables, upgrades of power plants, environmental education and awareness campaigns, reclamation of industrial sites: these are the core elements of the Memorandum of Understanding that Enel signed this year with the Environment Ministry, Legambiente



Agreement with the Gargano Park Authority

Hidden Power Lines at "Foresta Umbra"



Enel Distribuzione will contribute to environmental protection in one of the last Italian forests, the "Foresta Umbra", which lies inside the Gargano Park, the only national park of the Apulia region. Demolishing old lines, using underground cables and upgrading are the main actions that are set out in the Memorandum of Understanding that Enel signed in February with the Gargano Park Authority. Under the agreement, similar initiatives will also be taken in the historical heritage areas of the municipalities of Peschici and Monte Sant'Angelo.



Agreement with the Regional Park of the Po River Delta

Bird Friendly Power Lines

**Designed for not disturbing birds.
Fourth system of the kind in Europe.**

In the Po River Delta Park Enel Distribuzione and Terna are building an overhead power line that mitigates bird collision and electrocution hazards.

The avian protection system uses bird-flight diverters (for improving the visibility of wires), wider conductor spacing (based on the wingspread of the species settling in the protected area) and specially-designed insulating single-mast towers whose height does not interfere with migration routes.

This bird-friendly system is the fourth of the kind in Europe, after the ones placed

in the Doñana Park (Spain), in the Marais Poitevin Regional Park (France) and in the Rhine-Westphalia Park (Germany).

Under the agreement with the Consortium of the Po River Delta Park, Enel Distribuzione will also underground some power lines, downsize its substations and experiment renewable energy sources.

The European Commission is evaluating these environmental efforts in the Po River Delta Park in view of embodying them in its "Life Natura" projects.



Agreement with the Molentargius Park Authority

Thankful Flamingoes

**Agreement with
the Sardinia regional
authority for environmental
actions in the wetlands
and salinas of the area
east of Cagliari.**

located east of Cagliari. The Park accommodates wetlands with ponds and salinas of European importance and is a traditional resting place for the avifauna migrating between Africa and Europe.

Enel will significantly reduce the environmental impact of its overhead high- and medium-voltage lines by using underground cables, while upgrading its distribution grid and improving the quality of electricity supply.

The agreement with the Molentargius Park is another milestone in Enel's natural heritage conservation and quality-of-service improvement program, which resulted into agreements and alliances with the Park of Portofino, the Park of the Aniene River and the National Park of Abruzzo.

Enel Distribuzione and the Sardinia regional authority entered into an agreement on priority actions to be taken in an area of unique tourist and environmental value, the Molentargius Park,

In partnership with the Italian National Health Institute

Nesting on the Power Towers

In 2000, 110 new nest boxes were installed along the overhead power lines of the Cillarese Park.

From 1997 to 2000, about 1,000 nest boxes were installed, while in 2000 as many as 110 nest boxes were put in the Cillarese Park (Apulia), a major passage area for migratory birds. Enel also continued its activities for monitoring the nest boxes placed in Latium (urban parks of Decima and Marcigliana) and in Lombardy (Adda River Park) in past years and tagging the nested species in order to investigate their behavior.



Progress was made in Enel's "Nesting on Power Line Towers" project, implemented in partnership with the Italian National Health Institute: nest boxes and artificial perches for migratory bird conservation and research will be mounted on power line towers.

Italy's intense urbanization makes it difficult for migratory birds to find suitable trees and sites for nesting and this is the reason why some bird populations, particularly raptors, are declining.

As it happened in the United States and Spain, the most important outcome of these initiatives is a significant increase in nesting, especially of kestrels (settling in half of the installed nest boxes), tawny owls and jays.

A new element which arose from the monitoring activity was the occupation of the nest boxes also by wintering migratory species (buzzard, turtle dove, barn owl, little owl).

A webcam monitors rehabilitation

A Wildlife Surgery

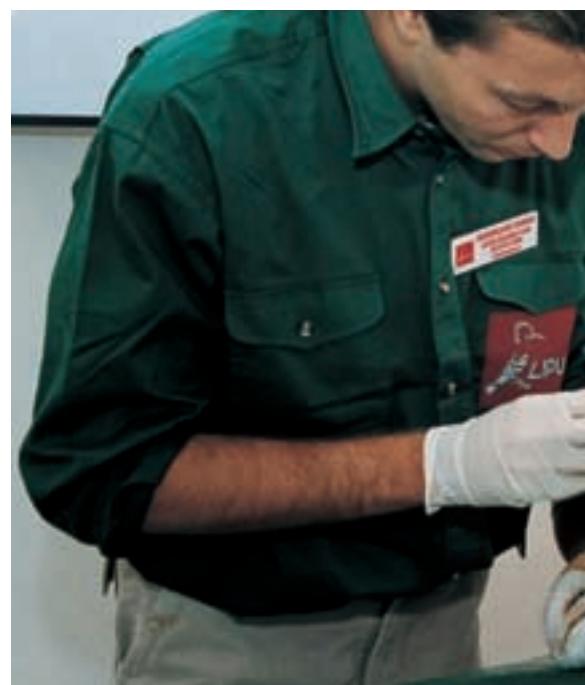
Enel's support to LIPU's hospital, where 16 thousand animals are treated every year.

Enel donated an operating theater to the animal hospital of Rome's Bioparco (formerly Zoological Garden), thus continuing its cooperation with this gratuitous facility that is run by LIPU (Italian Bird Protection Association). The hospital treats injured wild birds and other wild animals and reintroduces them into the environment. Every year, the hospital treats 16,000 two- or more-legged patients and fully rehabilitates over 10,000 animals, including birds, tortoises, hedgehogs and foxes.

Enel also funded the installation of a webcam, through which scholars and lovers of animals can track their rehabilitation and convalescence of these small patients.

Enel donated an operating theater to the animal hospital of Rome's Bioparco (formerly Zoological Garden), thus continuing its cooperation with this gratuitous facility that is run by LIPU (Italian Bird Protection Association). The hospital treats injured wild birds and other wild animals and reintroduces them into the environment. Every year, the hospital treats 16,000 two- or more-legged patients and fully rehabilitates over 10,000 animals, including birds, tortoises, hedgehogs and foxes.

Enel also funded the installation of a webcam, through which scholars and lovers of animals can track their rehabilitation and convalescence of these small patients.



Nature & Land

Nature Sanctuaries with the WWF

**Sanctuary of Le Mortine inaugurated this year.
Eight of Enel's green areas run by WWF.**

With the inauguration of the nature sanctuary of Le Mortine, Enel made further progress in its ongoing of cooperation with WWF for enhancing the natural value of the areas that are home to its power plants.

The project, called "Nature & Land", already covers eight areas of outstanding natural value - over 300 hectares - that are owned by Enel but directly run by WWF. This year, on the occasion of WWF's National Festival of Nature Sanctuaries, a special trail for physically-impaired people was opened in the Alviano sanctuary - near the hydro power plant of Baschi, thanks to the contribution of Enel and Eletrogen.



The environmental policy of the Enel Group

Enel's strategic targets and organizational structure, after the liberalization of the electricity industry, are in line with the environmental policy that the Group has shaped and pursued for some years.

This approach rests not only on ethical principles, but also on the awareness that the environment may be a competitive advantage in a market that is increasingly enlarged and demanding in terms of quality and behaviors.

Each company of the Group is engaged in reconciling high standards of environmental care with the delivery of high-quality and competitively priced products and services.

The holding company guarantees that the various companies, though operating in different areas of business, pursue goals that are consistent with the Group's strategic targets of environmental performance.

Principles

- The protection of the environment and of workers' health & safety is integral to Enel's decision-making process and not limited to compliance with legislation.
- The pursuit of high environmental standards is in tune with the improvement of efficiency and a driving force for enhancing the value and profitability of the Group's companies.

Strategic targets

1. Rational and efficient use of energy resources and raw materials.
2. Use of processes and technologies which represent the best international practices to prevent and/or mitigate environmental impacts.
3. Optimization of waste recovery.
4. Systematic introduction of formally recognized environmental management schemes in the different activities.
5. Definition of industrial strategies that are compatible with the principles of sustainable development and that place particular emphasis on the mitigation of climate change.
6. Improvement of energy efficiency in end uses, also by leveraging the potential capabilities of electricity.
7. Care in integrating new installations into the landscape and improvement of existing ones.
8. Continuous improvement of technologies and know-how.
9. Communication with the public at large and institutions on the environmental management of the Group.
10. Education of employees and raising of their environmental awareness, so as to enable them to perform their duties in environmentally responsible ways.

A photograph of a rainbow arching across a clear blue sky. The rainbow is vibrant, with distinct bands of color. It appears to originate from behind a range of dark, silhouetted mountains in the foreground. The sky above the mountains is a deep, clear blue.

2000

Environment and Safety
within the Enel Group

Organization

Within the Enel Group, the holding company relies on an environmental team, which has the mission of formulating policies of environmental care and sustainable industrial development.

The team has also the following tasks:

- issuing environmental policy guidelines for the companies of the Group;
- identifying indicators, monitoring & controlling actions in terms of environmental impact;
- promoting, negotiating and coordinating environmentally-oriented agreements and partnerships with authorities and agencies;
- tracking the process of law-making on environmental matters, at national and EU level, and issuing implementation guidelines for the companies of the Group;
- liaising with environmental agencies and institutions.

Furthermore, depending on the tasks to be accomplished and on the issues to be covered, each company may have in-house environmental specialists or teams.

With regard to occupational health & safety, Enel issued an internal document (February 1, 2000) describing the principles and organization of a scheme for improvement of occupational health & safety within the Group, in accordance with Legislative Decree 626/94.

In particular, the document identified the "production units" (as defined in the Decree), corresponding to Enel's holding and controlled companies, the persons in charge (employer and occupational health & safety managers) and the services that they provide (prevention and protection, health surveillance).

Furthermore, to promote homogeneous behaviors inside the various business units, the individual companies may set up ad-hoc advisory coordination committees.

Instruments

Voluntary agreements

Voluntary agreements are the instruments that Enel selected for pursuing an environmentally-sound industrial policy.

In line with Italian Government's guidelines and European Union's recommendations, these agreements with authorities, environmental and trade associations can trigger the right synergies for achieving common sustainable development targets.

Voluntary Agreement between Enel and the Ministries of the Environment and of Industry

On July 20, 2000, Enel entered into a voluntary agreement with the Ministries of the Environment and of Industry (now Ministry of Production Activities). This is the first and most important Italian protocol on greenhouse gas emission reductions, after the 1998 resolution of CIPE (Interministerial Committee on Economic Planning), which assigned greenhouse gas reduction targets and actions to the various industrial sectors.

Under the Agreement, Enel commits to cutting its carbon dioxide emissions (per kWh generated) by 13.5% by 2002 and by 20% by 2006. This means that, electricity generation remaining equal, CO₂ emissions will be down by 15 and 22 million tons from their levels in 1990, the base year specified in the Kyoto Protocol.

To reach this ambitious target, all the companies of the Group are involved in a wide spectrum of actions in the following main areas:

- increasing the energy and environmental efficiency of thermal generation, also through flexible operation of power plants, while meeting the agreed CO₂ reduction targets;
- developing electricity generation from renewables;
- holding down losses on the distribution grid;
- enhancing energy efficiency in end uses.

Other key instruments of the Agreement are the implementation of international projects (Joint Implementation and Clean Development Mechanism) and the trading of emission allowances (Emissions Trading), as set forth in the Kyoto Protocol.

In this way, Enel gives a major contribution to the fulfillment of the Italian pledge of curbing greenhouse gas emissions by 6.5% in the 2008-2012 period.

By signing the Agreement, also the Ministries made specific commitments, such as:

- assigning to Enel emission reduction targets that are coherent with those of the Agreement and in line with the relevant national commitments;
- enabling Emissions Trading at the national level, between the various sectors (and also inside the Enel Group), and at the international level;
- encouraging and supporting emission reduction projects;
- providing Enel with emission credits generated by projects that involve indirect CO₂ reductions.

Memorandum of Understanding for deployment of renewables in protected areas

In the early months of 2001, an important memorandum of understanding was signed between Enel, the Ministry of the Environment, Legambiente (an Italian environmental association) and the Italian Federation of Parks and Nature Reserves. The purpose of the accord is to use protected areas as priority demo sites for testing, developing and deploying renewable energy systems.

This is a novel instrument for coordinating and developing of policies of conservation of protected areas, an instrument which builds on the initiatives that Enel has taken in previous years within the framework of its Nature & Land program.

Among the actions mentioned in the Memorandum:

- deployment of renewables;
- conservation and enhancement of protected areas which host renewable power plants;
- dissemination of information about initiatives for rational energy use;
- sustainable management of water resources.

Participation in the Memorandum is open to partners that share its purposes. The National Association of Minor Island Municipalities (ANCIM), the National Union of Mountain Communities (UNCEM) and the Union of Italian Provinces (UPI) have already joined.

Management schemes

Besides voluntary agreements, management schemes are another instrument that can improve the performance and organization of the Enel Group, through continuous monitoring of environment, quality and safety aspects. These aspects play a crucial role for shaping the corporate strategy and ensuring an increasingly high performance, so as to meet customers' and shareholders' most challenging expectations.

Environmental management

In 2000, Enel continued the phasing-in of environmental management schemes in order to certify its industrial sites under the ISO 14001 standard and the EMAS (Eco-Management and Audit Scheme) regulation.

Strong commitment to environmental certification is testified by the fact that Enel planned to achieve the EMAS registration for 50% of its installed capacity by 2001 and for 100% by 2005.

The sites that have already gained the EMAS registration are: the thermal power plants of La Casella, Tavazzano, Torrevaldaliga Nord, Torrevaldaliga Sud, Turbigo and the hydro power plants of the Cordevole valley, previously certified under the ISO 14001 standard. Furthermore, in the course of 2000 and in early 2001, the thermal power plants of Fusina, Monfalcone, Porto Marghera, Porto Tolle, Sulcis and the hydro power plants on the Avisio River were certified under the ISO standard (and are awaiting the EMAS registration).

In June 2001, about 22% of the overall generating capacity was certified.

In 2000, Enel received an official recognition for its environmental certification by the Ministry of the Environment.

ISO 14001 for WIND

WIND was one of the first mobile telephony operators in Italy and among the few in Europe to earn the ISO 14001 certification for its environmental management system. The certification requires rigorous choices not only in the operation, but also in the design and installation of systems, choices which enable the control of electromagnetic emissions and a better protection of the environment.

WIND also keeps under control the visual impact of its aerials, waste management and energy consumption.

Safety management

In addition to initiatives for the environment, the Enel Group is also committed to developing safety management systems.

In line with the Group's policy of injury prevention, Enel Distribuzione took a systematic and uniform approach to health & safety in workplaces and began procedures for phasing-in a Safety Management System, based on the international Occupational Health & Safety Assessment Series standard (OHSAS 18001). The system introduces an auditable and measurable process for assessing the continuous improvement of working conditions. By constantly monitoring criticalities, effective corrective actions may be taken in accordance with corporate rules and legislation on occupational health & safety. To enhance the value of its safety management system, Enel Distribuzione applied for the IMQ-CSQ conformity certification.

Reporting

In 1996, Enel developed a system for quarterly reporting of its environmental data, in order to constantly keep track of the parameters of its industrial activities.

The reporting system was fine-tuned over time with the introduction of techniques and procedures that ensure data reliability. New reporting formats were also adopted, both to acquire occupational health & safety data and to tailor the reporting system to the Group's diversified business.

Data reporting is now an integral part of Enel's environmental management and its methodology ensures the best possible homogeneity of the reported data.

Awareness, training & education

Awareness, training & education are fundamental instruments that Enel uses for disseminating knowledge about initiatives that are taken inside and outside the Group and for improving the skills and know-how of its employees.

In 2000, Enel developed environmental awareness, training & education modules for its environment-dedicated personnel, delivering over 30,000 hours of courses.

A course on sustainable development enriched the program of distance teaching (which already featured a course on the greenhouse effect) that covers all the members of Enel's personnel.

Environmental awareness, training & education courses add to over 400,000 hours of training & education on health & safety in workplaces. These courses are designed to train the personnel for the positions referred to in Legislative Decrees 626/94 (prevention and protection manager, emergency staff, workers' safety representative) and 494/96 on the safety of temporary and mobile construction sites (design coordinator, site management coordinator). Particular attention was paid to the prevention of risks connected with handling of loads, use of working equipment (slings for loads, use of cranes and elevating platforms, etc.) and to the adoption of correct prevention practices in industrial sites that are characterized by the presence of pollutants (power plants). To increase the coverage of these training & education activities, resort was made to multimedia tools. For instance, Enel Produzione's staff unit for occupational health & safety organized a course on Legislative Decree 626/94 and in particular on the framework Directive 89/391/EEC on the introduction of measures to encourage improvements in the health & safety of workers at work.

Economic resources

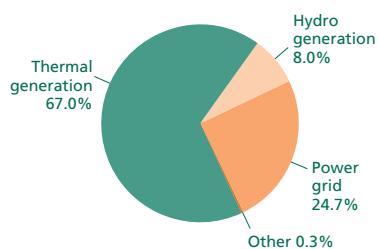
Environment

In 2000, environmental investments were equal to about 500 million euros (nearly 1,000 billion lire), while the current expenditure on environmental actions was estimated at about 1,300 million euros (about 2,500 billion lire).

The investments made in 2000 declined by about 30% on 1999, as a result of progressive completion of environmental compliance actions and of decreasing costs of components. By contrast, the current expenditure rose significantly, owing above all to a higher increase in the prices of low-sulfur fuel oil and to the growing use of natural gas.

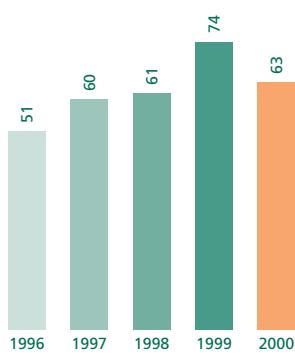
In the wake of Enel's previous Environmental Reports, the environmental expenditure is defined as the costs incurred for protection of the external environment, whether required for compliance with environmental legislation or for implementing voluntary decisions made by the Group.

Environmental investments in the different areas of activity



Investments in thermal power plants for environmental compliance

% of total investments in thermal power plants



In 2000, the most significant environmental investments were made in the following areas:

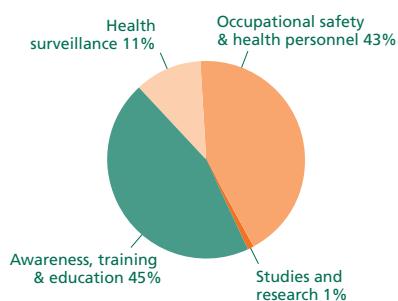
- thermal power plants: retrofits for environmental compliance, in the range of 330 million euros (about 665 billion lire), totaling about 63% of the total investments in thermal generation;
- power grid: roughly 120 million euros (approximately 240 billion lire), i.e. over 8% of the total investments in the grid; the most substantial component of this figure (about 110 million euros, i.e. about 210 billion lire) is represented by the installation of insulated cables (overhead or underground) on low- and medium-voltage power lines.

The current environmental expenditure for 2000 includes:

- costs for the operation of all equipment and systems for environmental protection in the range of 155 million euros (around 300 billion lire); this figure comprises the operating costs of the above equipment and the costs of waste disposal, Enel's personnel and external services (mostly for power plants);
- eco-taxes: for thermal generation, the eco-tax on SO₂ and NO_x emissions was equal to 27 million euros (about 53 billion lire), while the carbon tax on fossil fuels amounted to another 38 million euros (roughly 75 billion lire);
- environment-related costs, such as those incurred for the implementation of local agreements on environmental matters, in the range of 88 million euros (about 170 billion lire);
- costs of low-sulfur fuels used for environmental compliance, especially of natural gas (in all cases where this use is not technologically captive), accounting for an extra expenditure of roughly 1 billion euros (about 2,000 billion lire).

Health & safety

Main items of current expenditure

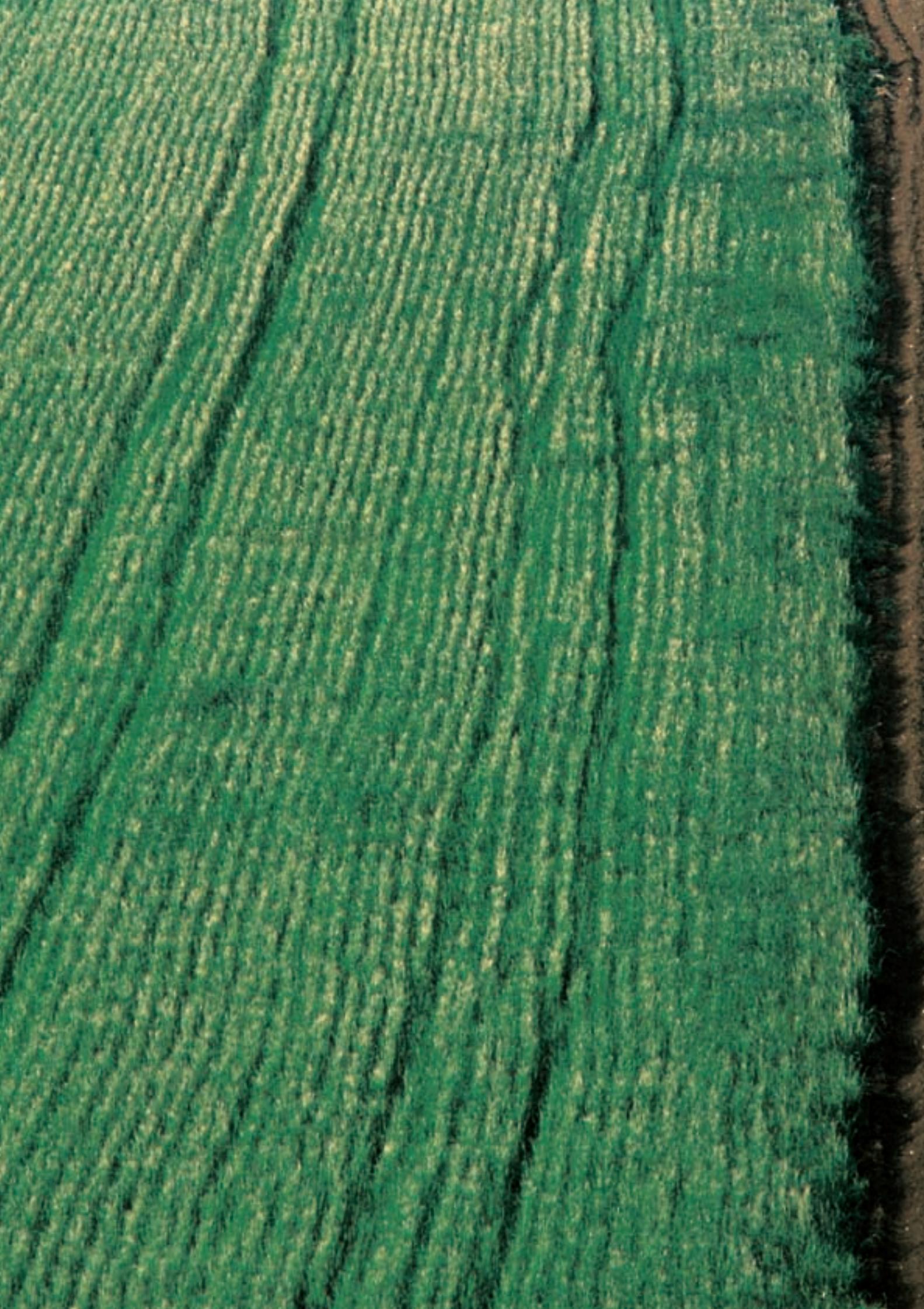


In 2000, the Enel Group introduced a separate accounting process for occupational health & safety expenses, excluding - in the initial stage - the investments in renovation and retrofitting of equipment and systems which were made to conform to the applicable legislation. Given the complexity of posting all the different types of costs, only the most significant items of current expenditure were reported after gathering them into the following categories:

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

In 2000, the above categories of expenditure amounted to 31 million euros (about 60 billion lire).

The "awareness, training & education" category embodies the activities that are listed in Legislative Decrees 626/94 and 494/96, i.e. training of workers' safety representatives, prevention and protection managers, emergency staff, design and site management coordinators.



2000

Main Environmental Results

Energy efficiency

Enhancing the energy efficiency of its power installations is one of the goals that Enel incorporated in the Voluntary Agreement. To this end, Enel embarked on an impressive program of conversion to combined cycles, one of the most challenging in the world, which will raise the average efficiency of the totality of its thermal power plants from 38% to 45% by 2006.

Conversions to combined cycles by 2006

Enel Produzione	Eurogen	Eletrogen	Interpower
La Casella (in progress)	Brindisi Nord	Monfalcone	Napoli Levante
Livorno	Chivasso	Ostiglia (in progress)	Torrevaldiga Sud
Pietrafitta (in progress)	Piacenza	Tavazzano	Vado Ligure
Porto Corsini (in progress)	Sermide		
Priolo Gargallo (starting)			
Rossano Calabro			
Santa Barbara			
Termini Imerese			

The energy efficiency program also extends to the distribution grid, with a number of actions on power lines and substations that will further reduce grid losses.

End uses

The energy efficiency program did not neglect the end uses of electricity. Demand-side measures are wide-ranging and involve different companies of the Group:

- Enel Distribuzione with deployment of efficient electrotechnologies;
- Enel.sì with construction, maintenance and operation of more efficient electrical systems;
- Erga with district heating via geothermal fluids;
- Conphoebus with energy audits in buildings, design and development of energy recovery projects for buildings and their systems, as well as construction of small renewable power facilities;
- Sei with renovation of buildings and actions on the building envelope and air conditioning/heating systems;
- So.ile with design and construction of more efficient public lighting systems and of electric vehicle recharging stations.

The Decree on energy efficiency

On April 24, 2001, the Ministry of Production Activities, in consultation with the Ministry of the Environment, issued a decree identifying quantitative targets for improving energy efficiency in the end uses of electricity, as per art. 9, para. 1 of Legislative Decree no. 79 of March 16, 1999.

The Decree sets primary energy reduction targets that energy distributors are required to attain on a yearly basis, beginning in 2002. At least 50% of the targets are to be reached by reducing electricity consumption.

The Electricity & Gas Regulator will issue Energy Efficiency Certificates giving evidence of actual reductions that distributors have achieved with appropriate actions or projects. To more closely approach this goal, the Enel Group put in place a Task Force for Coordinating and Monitoring Energy Efficiency Initiatives.

The Task Force, which is coordinated by Enel Distribuzione, has the mission of assisting the other companies of the Group in the identification and implementation of projects which may qualify for Energy Efficiency Certificates.

Deployment of renewables

In the past few years, **deployment of renewables** has been high on the agenda of Enel's energy and environmental strategies.

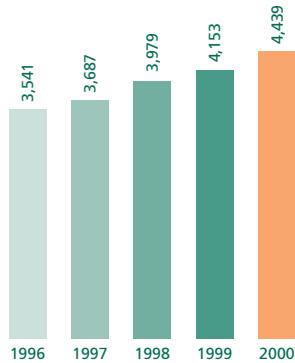
Erga, one of the companies of the Group, has been active in this field for more than one year, adopting a strategy of national expansion and acquiring foreign companies that produce power from renewables: [CHI Energy](#) (261 MW installed in the US) and [Energia Global International](#) (246 MW in South America). With over 2,000 MW of installed capacity, Erga now ranks first in the world for electricity generation entirely from renewables.

Generation

Total generation from renewables
GWh



Generation from geothermal, wind and solar sources
GWh



The Enel Group and the 2% renewable-power obligation

Actions in the area of renewables are not only referred to in the Voluntary Agreement, but also set out in Article 11 of the "Bersani Decree" (on liberalization of the electricity industry). This Article stipulates that, beginning in 2002, a specified proportion of the electricity that power producers & importers supply to the national power system every year shall come from "new" power plants fed by renewable sources. The proportion of renewable power shall be equal to at least 2% of the electricity from thermal power plants that the above operators have generated or imported in the previous year. The above operators may opt to fulfil their renewable-power obligation - not existing in the other countries of the European Union - by purchasing "green certificates" from other operators. The green certificates, giving evidence of actual generation from renewables, are issued by GRTN (Gestore della Rete di Trasmissione Nazionale - Italian Independent System Operator). In this setting, Erga is bound to play a crucial role. In 2002, in spite of this, the Enel Group will not be able to meet the renewable-power obligation with its own generation.

The RECS initiative

Apart from its national obligations, Enel - along with the main Italian electric operators - joined RECS (Renewable Energy Certificates System), an international initiative involving electric operators from fifteen other countries.

The goal of RECS is to develop renewables through the creation of an international, transparent, efficient and reliable green certificate market.

The on-going pilot stage of RECS is expected to end by 2002.

With a view to operationalizing RECS, a number of documents were published, such as:

- the Basic Commitment, a set of common rules for issuing and trading green certificates;
- national protocols for adjusting the common rules to national realities;
- standardized contract for the transfer of green certificates between the various countries.

Programs

In the future, Enel Produzione plans to install 140 MW of new [hydro](#) capacity by 2001 and 50 MW by 2002.

Furthermore, by 2005, Erga will place into operation about 50 MW of new capacity from mini-hydro plants - including new plants, reactivation of decommissioned plants and repowered plants - of which 5 MW by 2001.

As to the other renewables, Erga will increase its geothermal capacity by roughly 340 MW and its wind capacity by about 350 MW by 2005. Within 2001, the capacity from geothermal and wind power plants will rise by approximately 45 MW and 20 MW, respectively.

With regard to [geothermal](#) generation, reinjection activities were intensified in order to prolong the life of geothermal reservoirs.

As regards the non-electric uses of geothermal fluids, it is worth mentioning: i) the signature of a contract for the construction of the district heating grid of Pomarance (Pisa); and ii) the design of additional heating systems, e.g. for greenhouses.

In the area of [photovoltaics](#), Enel is actively engaged in the program known as "10,000 photovoltaic rooftops" through Conphoebus, one of its companies. Its contribution to the program is equal to about 800 kW.

Moreover, Erga is conducting feasibility studies and developing projects for supplying electricity to some minor islands (Capraia, Panarea and Pantelleria) - by means of photovoltaic-wind hybrid systems to be grid-connected - as well as to isolated users.

Reduction of emissions

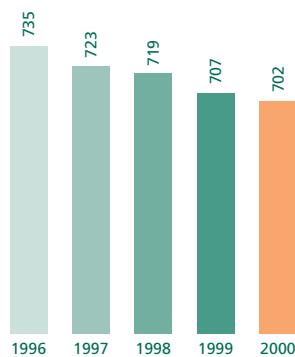
Commitment to air quality has always been one of Enel's priority targets. In the past few years, Enel also committed to climate change mitigation.

Over and above its environmental upgrades (to comply with Ministerial Decree of 12, July 1990, transposing the European Directive on Large Combustion Plants into the national legislation), Enel launched an ambitious new program for converting to combined cycles some of its power plants where fuel oil is the dominant fuel.

Also in 2000, Enel succeeded in improving its performance in terms of reduction of emissions into the atmosphere. With respect to 1999, the Group further slashed its emissions (per thermal kWh generated) of carbon dioxide (CO₂) by 1%, sulfur dioxide (SO₂) by 15% and nitrogen oxides (NO_x) by 13%.

CO₂

Specific CO₂ emissions
g/kWh thermal (net)



98% of the Group's CO₂ emissions derive from the combustion of fuels in thermal power plants. Geothermal plants emit about 1.9% of CO₂, while the remaining 0.1% is a by-product from the chemical reaction of SO₂ abatement in flue gas desulfurizers.

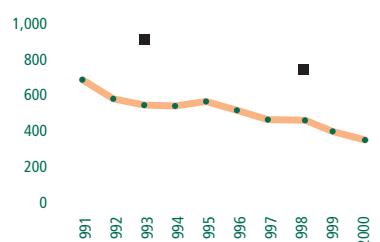
Since 1996, specific emissions of CO₂ from thermal generation have had a steadily declining trend, reaching 702 g/kWh in 2000, thanks also to greater reliance on natural gas. In 2000, specific CO₂ emissions were down by 7% from their 1990 levels.

A significant contribution to the reduction of CO₂ emissions will also result from Enel's commitments under its Voluntary Agreement with the Government.

Additional contributions may arise from Enel's numerous initiatives of application of the Kyoto mechanisms (Joint Implementation, Clean Development Mechanism and Emissions Trading), for which the reader is referred to the relevant section in this Report.

Total SO₂ emissions

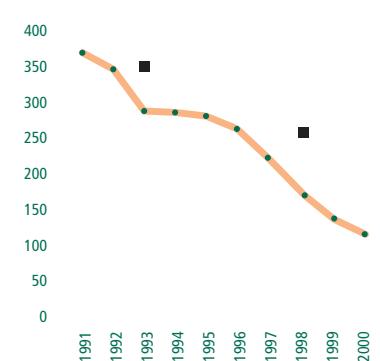
thousand t



Regulatory limits: ■ Ministerial Decree of May 8, 1989 (Enel's share)

Total NO_x emissions

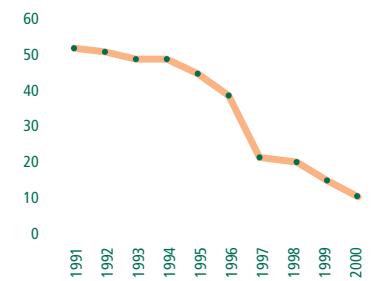
thousand t



Regulatory limits: ■ Ministerial Decree of May 8, 1989 (Enel's share)

Total particulate emissions

thousand t



Emissions of SO₂, NO_x and particulates

Within December 31, 2002, Enel will complete its environmental actions on thermal power plants so as to comply with the emission limits laid down in the Ministerial Decree of July 12, 1990.

The following actions were carried out:

- installation of flue gas desulfurization and denitrification systems for abating sulfur dioxide and nitrogen oxides, respectively;
- retrofit of combustion systems and installation of low-NO_x burners;
- use of low-sulfur fuels (from 1996 to 2000, natural gas consumption rose by about 88%);
- putting in place of advanced technological and operational processes for particulate collection (bag filters, pulse feed of electrostatic precipitators, electrode cleaning systems, flow homogenization, additives), also developed by Enel.

Total emissions and percentage change on 1999 and 1996

	thousand t	% change on	% change on
	2000	1999	1996
SO ₂	354	- 12	- 34
NO _x	129	- 11	- 52
Particulates	14	- 11	- 64

Besides actions on its power plants, Enel took emission reduction initiatives in other areas that are not related to power generation.

Among these initiatives, it is worth mentioning: i) the introduction of Supertech, a device which is expected to abate emissions from Enel's fleet (about 29,000 vehicles); and ii) the appointment of in-house mobility managers, having the task of encouraging Enel's employees to switch from private cars to more environmentally sustainable modes of transport for their home-to-office commuting.

Supertech

To give a contribution to the search of solutions for driving down emissions into the atmosphere, Enel decided to experiment a device called Supertech. The device, placed into the fuel tanks of cars, is expected to cut fuel consumption and significantly abate polluting emissions.

The device (a metal cylinder consisting of two magnets, one diode and some ceramic components) temporarily alters the molecular structure of fuel, allowing greater penetration of air. The process improves engine efficiency by burning the usually unburned portion of hydrocarbons.

To test the viability of this concept, Enel launched an experimental program by mounting the device on two cars (one gas-oil and the other gasoline-fueled).

The findings from the program will be released in September 2001, i.e. at the end of the experimental stage.

Mobility managers

In the last months of 2000, Enel appointed mobility managers for its Rome and Florence offices.

The position of mobility manager is defined in the Decree adopted by the Ministry of the Environment on March 27, 1998. The Decree provides that companies and public entities with more than 300 employees and based in air pollution-sensitive areas are required to have in-house mobility managers. Mobility managers are responsible for proposing alternative solutions to employees' travel to work, by developing Corporate Mobility Plans and encouraging their colleagues to switch from the use of private cars to more environmentally-efficient modes of mass transit.

For its Rome offices, prior to the formulation of mobility plans, Enel is assessing the present supply of mass transit and the mobility of its personnel.

In Florence, at the request of the mobility manager, the Municipality opened a new mass transit line connecting the Campo di Marte railway station to Enel's building. The service, used by 130 employees, has been free of charge until the end of March 2001; now, it is available by subscription at discounted fares.

With these initiatives, Enel not only contributes to sustainable mobility, but also honors one of the commitments made under its Voluntary Agreement on greenhouse gas emission reductions that it signed with the Ministries of the Environment and Industry on July 20, 2000.

Rational use of water

Reduction of abstraction from inland waters million m³



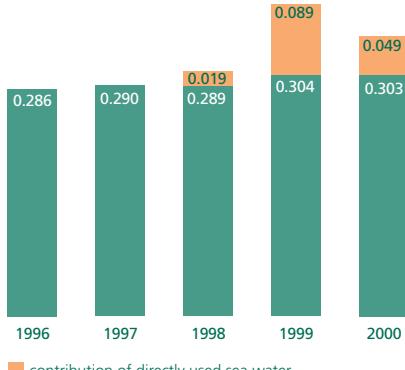
Among the various industrial uses of water, those which are required by thermal generation are the most substantial ones (98%). In thermal power plants, water is primarily used for:

- producing pure (demineralized) water for the generation process;
- making up for losses by evaporation in closed-cycle cooling tower systems;
- operating desulfurizers.

A small percentage of water is used in the drilling of geothermal wells, to integrate geothermal steam condensates.

The consumption of water by other types of plants is practically nil.

Specific water requirements for industrial uses in thermal generation liters/kWh



Water requirements for industrial uses rose from 40.7 million m³ in 1996 to 49.9 in 2000. Nevertheless, thanks to a significant increase of water recovery and greater production of freshwater via sea water desalination, the abstraction from inland waters (rivers, wells and aqueducts) fell by 14% (35.5 to 30.7 million m³). The contribution of desalinated water climbed from 3.6 million m³ in 1996 to 8.7 in 2000, while internal recovery went up from 1.5 to 3.6 million m³ in the same period.

The year 2000 confirmed the downward trend of waste waters from treatment systems (including meteoric waters, whose amount may be high) and of those that are actually discharged (after deducting the portion that is recovered internally). The waste water that is treated is compliant - with wide margins - with the maximum concentrations of pollutants that the current legislation (Legislative Decree no. 152 of May 11, 1999) prescribes for water releases in view of protecting water bodies.

Furthermore, large volumes of water (in 2000, about 23 billion m³) are used for the cooling of steam-turbine power plants. However, almost all of this water is returned to the original water body with a limited temperature increase (usually in the range of 6-9°C).

Additives to prevent fouling (especially sodium hypochlorite) are often added to the cooling water. However, the use of batching systems that track the fouling process reduces the amount of these additives to a minimum.

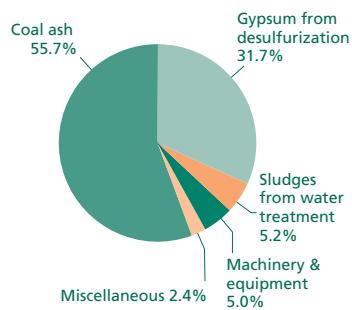
Integrated waste management

Enel continued actions of integrated waste management in its industrial sites, without disregarding any of the stages of the waste cycle, from separate collection to recovery. Most of the waste derives from electric activities.

Waste production

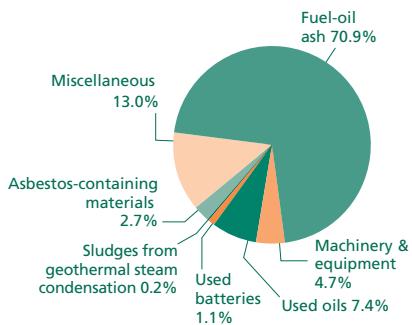
Non-hazardous special waste

2000 total: 1,773,116 t



Hazardous special waste

2000 total: 38,943 t



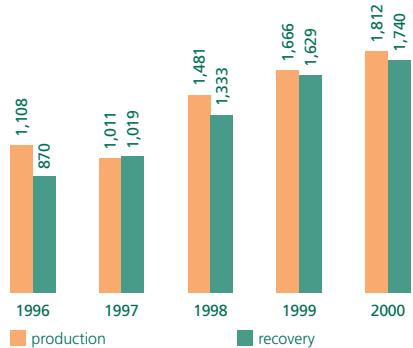
Waste production

Thousand t

	1996	1997	1998	1999	2000
Coal ash	916.3	773.9	883.8	890.0	987.1
Gypsum from desulfurization	-	11.9	275.7	509.3	562.2
Other non-hazardous special waste	151.8	169.6	250.9	213.0	223.8
Fuel-oil ash	31.2	39.6	55.2	40.5	27.6
Other hazardous special waste	8.5	15.6	15.6	13.2	11.4
TOTAL	1,107.8	1,010.6	1,481.2	1,666.0	1,812.1

In 2000, the production of hazardous special waste plunged from about 54,000 to about 39,000 tons. The 2000 decrease (approximately 32% on 1999) mainly depends on lower production of fuel-oil ash, as a result of lower utilization of fuel oil as an energy source.

Total waste production and recovery thousand t



The waste recovered in 1996 does not include hazardous waste other than fuel-oil ash, which is estimated at 10,000 tons at the most.

Waste recovery

In 2000, the recovery of non-hazardous and hazardous waste from electrical activities accounted for 96% of the total waste production, thus validating the effectiveness of policies minimizing the delivery of waste to dump sites.

This result derives from the delivery of all of the coal ash and gypsum from desulfurization to recovery operators. Coal ash is used especially in cement production or as an aggregate for road paving, while the versatility of gypsum makes it usable in a variety of applications.

The recovery of other non-hazardous special waste was practically identical to the value recorded in 1999.

The recovery of fuel-oil ash and of other hazardous special waste showed a downward trend.

It is worth pointing out that the percentage recovery of some waste items exceeded the value of 100, meaning that they were produced at the end of the year, but that their delivery to recovery operators was postponed to the next year.

Waste recovery

% of production

	1996	1997	1998	1999	2000
Coal ash	90	113	107	106	101
Gypsum from desulfurization	-	33	87	99	102
Other non-hazardous special waste	29	75	48	75	73
Fuel-oil ash	4	15	28	40	16
Other hazardous special waste	-	46	53	60	40
TOTAL	79	101	90	98	96

Used oils

In 2000, Enel produced a total of 2,895 tons of used oils (about 16% less than in 1999), which were totally delivered to the special consortium and/or to authorized operators.

Most of these oils come from Enel Distribuzione, where over 80% of the equipment is now free of PCBs (polychlorinated biphenyls).

Asbestos-containing materials

In 2000, the production of asbestos-containing waste dropped sharply, reaching 1,038 tons. Most of this waste originates from remediation work on thermal and geothermal power plants. Part of the waste is delivered to recovery facilities, where it undergoes a stabilization process (via vitrification), while the remaining part is transferred to authorized dump sites.

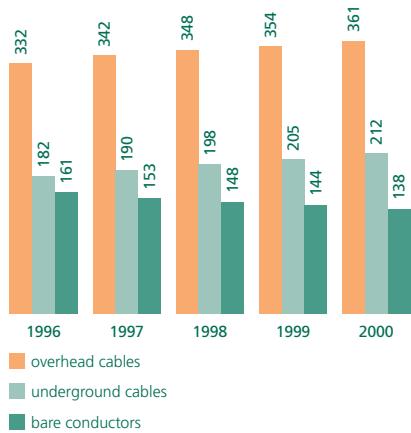
Used batteries

In 2000, 429 tons of used lead batteries (a value comparable to the one recorded in previous years) were delivered to COBAT (special consortium for management of used lead batteries and lead-containing waste).

Rationalization of the power grid

Low-voltage lines

thousand km



With holdings in Terna and Enel Distribuzione, the Enel Group owns the most part (over 37,000 km) of the national transmission grid and a large part (about 1,063,000 km) of distribution grids.

For some years Enel has placed particular emphasis on environmentally-sound policies of power grid management and extension.

In line with the Group's environmental policy, a program of rationalization of the power grid was initiated. The program encompasses actions on existing lines and design of new lines with innovative concepts that harmonize with the landscape. These actions have also the purpose of reducing grid losses.

New routes for power lines

Enel established fruitful relations with local authorities in order to integrate power grid planning into land planning policies, i.e. to embody power grid extension requirements in the early stages of land development planning.

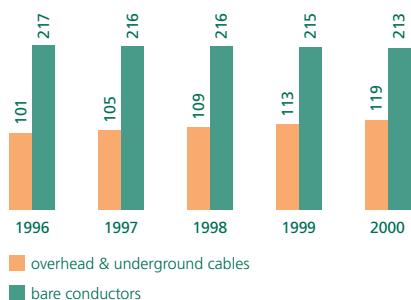
The first results were achieved in Emilia Romagna: the provincial land development coordination plans accommodate power grid extension considerations. Similar steps were also taken in Liguria, Piedmont, Marche and Tuscany. To promote increasingly transparent relations with local authorities, initiatives were also taken for the creation of [regional inventories of power installations](#) (Emilia Romagna, Piedmont, Liguria).

Attention to better integration of the grid into the landscape led Enel to redesign the towers that support its power lines. After a competition that was organized to invite proposals from the most famous national and international architects, Enel selected the most suitable tower design for effectively integrating high-voltage power lines into the environment.

In the course of 2001, the new tower will be used in some country-side areas of Tuscany.

Medium-voltage lines

thousand km



Increased use of insulated cables (overhead and underground) for low- and medium-voltage lines

Overhead and underground insulated cables for LV lines reached a length of about 361,000 and 212,000 km, respectively; for MV lines, they are equal to roughly 4,000 and 115,000 km, respectively.

During the year, the length of bare conductors diminished by about 5,500 km on LV lines and by about 2,000 km on MV ones as against the previous year.

Power lines in protected areas

Enel's signature of the Memorandum of Understanding - mentioned in the section on Voluntary Agreements - with the Ministry of the Environment, Legambiente (an Italian environmental association) and the Italian Federation of Parks and Nature Reserves marked an intensification of efforts for better integrating the power grid into protected areas and places of high architectural-natural value.

The Memorandum boosted the 1999 initiatives that Enel had taken in the National Park of Abruzzo and in the Park of Portofino. In the latter Park, the following additional actions will be carried out in 2001:

- demolishing 136 towers and 15 km of lines;
- undergrounding 19 km of lines;
- replacing 4 km of bare conductors with insulated ("elicord") cables.

The Group went on with its grid rationalization program in other parks and protected areas, such as the Molentargius Park (Sardinia), and Enel Distribuzione signed a cooperative agreement with the Gargano Park Authority.

Furthermore, in the first half of 2001, Enel Distribuzione signed a memorandum of understanding with the Consortium of the Po River Delta Park in order to mitigate the visual impact of electricity infrastructures.

The protocol provides for: i) demolition of old lines and construction of new ones with overhead and underground insulated cables; and ii) installation of visual signaling devices that prevent birds from colliding with power line conductors.

Beyond power grid rationalization

Enel's dedication to land conservation translates not only into grid rationalization, but also into actions for controlling unauthorized construction, which often represents an environmental emergency.

To this end, Enel signed a [Joint Declaration](#) together with ANCI (Association of Italian Municipalities), Legambiente and ANCE (National Association of Building Contractors). Under the Declaration, Enel undertakes to suspend its electricity supply to buildings which have been erected without a building permit or which do not meet the requirements of the building permit.

Enel's commitment to and initiatives for landscape conservation and enhancement can be easily perceived by the public. These initiatives include:

- increased use of insulated cables, either overhead or underground, for LV and MV lines;
- new power line routes that harmonize with the landscape.

Electric and magnetic fields

In the past few years, the alleged risks of human exposure to electrical and magnetic fields have led to an extensive public debate, which involved members of the scientific community, policy-makers, economic and social forces.

Attention was focused on the fields generated by radio-frequency installations (radio stations for mobile telephony, radars and fixed systems for broadcasting) and by power lines (power transmission and distribution lines, transforming stations and substations). In a context of high uncertainty, where scientific research did not identify full evidence of a causal relationship between prolonged exposure to electrical and magnetic fields and possible long-term effects on health, Enel adopted a precautionary principle, in line with the approach taken by other countries.

Under this principle, Enel uses the best available technologies to minimize the levels of the magnetic field generated by power transmission and distribution systems.

As early as in 1996, after surveys conducted on its grid, Enel submitted applications to the Ministry of the Environment for being authorized to conduct mitigation actions on some sections of its lines, in accordance with the Decrees of the President of the Council of Ministers of April 23, 1992 and of September 28, 1995. So far, roughly thirty mitigation actions have been completed, while for the others the authorization is pending.

The Italian Parliament recently passed a frame-law on protection from exposure to electric, magnetic and electromagnetic fields (no. 36 of February 22, 2001).

The law sets out the core principles for protecting the health of workers and of the general population from the effects of exposure to specified levels of fields.

The law also defines the **exposure limit** (aimed at protecting the general population from acute effects and never to be exceeded), the **attention value** (not to be exceeded in places where the exposure is longer than four hours) and the **quality targets** (technological references for new power installations). The related values will be identified in the implementing decrees.

Another key development is the creation of the national inventory of electric and magnetic field sources and of their locations.

Initiatives for the application of the Kyoto Protocol mechanisms

Joint Implementation and Clean Development Mechanism

Enel - especially through Enelpower and within the framework of the E7 Group - is implementing projects of emission reductions in foreign countries.

As soon as the rules and operation of the mechanisms are defined, these projects will allow our country to acquire CO₂ credits.

Enel also takes part in the international debate on the application of Joint Implementation (JI) and Clean Development Mechanism (CDM) initiatives. Jointly with the other members of the E7 Group, Enel presented a proposal for CDM guidelines to the United Nations Climate Conference which was held in the Hague in November 2000. Enel also participates in the JOINT project, funded by the European Commission.

Emissions Trading (ET)

Apart from the entry into force of the Kyoto Protocol, a market of emission allowances is already operational, although its demand is concentrated in North America.

Together with other domestic and international industrial groups, Enel believes that Emissions Trading is an effective and efficient instrument for pursuing greenhouse gas emission reduction targets.

As ET can take place at different levels (corporate, domestic and international), Enel developed various initiatives to gain greater understanding of its operation and to foster its application.

The GETS initiative

In 2000, Enel participated in Eurelectric's GETS (Greenhouse Gas & Electricity Trading Simulation) initiative. The initiative simulated the running of a dual market for electricity and tradable greenhouse gas emission permits. The simulation involved about 40 major European companies of the electricity industry and of other energy sectors, as well as energy consumers (oil, gas, steel, chemicals, cement, paper). The European Commission helped define the rules. The lessons learned from the simulation exercise may be summarized as follows:

- ET enables companies to integrate environmental targets into their strategies and decision-making processes and to optimize their investment timescales;
- in a context like the Italian one, the assignment of an economic value to CO₂ emissions will have a significant impact on electricity costs;
- CO₂ credits generated by JI or CDM projects or by national energy efficiency projects can be easily integrated into an ET mechanism.

At the **corporate level**, Enel explored the possibility of applying ET within the Group, as part of the obligations arising from its Voluntary Agreement with the Government.

For this purpose, Enel formulated a plan for involving not only the units that are directly responsible for greenhouse gas emissions (thermal generation), but also those which may indirectly curb emissions through power generation from renewables, reduction of grid losses, energy efficiency in end uses.

At the **national level**, Enel started a process of consultation with other industrial sectors and trade associations, in order to assess the feasibility of designing a national ET system to be integrated into the European-wide process that was launched by the European Commission's Green Paper of March 2000. The parties to the consultation are not only the electricity, oil, chemicals, paper, concrete, steel and glass industries, but also the Ministries of the Environment and of Production Activities.

This informal task force has three main goals:

- to analyze the main political, economic, legal and technical issues that are implied in the development of an ET system, and suggesting solutions;

- to lay the foundations for identifying activities and instruments for the implementation of an ET system;
- to help seek a common Italian position, which may be represented in international fora, especially within the European Union.

With regard to the [international dimension](#), Enel joined EMDG (Emission Market Development Group), an initiative that is aimed at creating a standardized tradeable carbon unit that would have the same validity everywhere. This carbon unit would be traded as a commodity and capture the relevant benefits, as opposed to a market based on bilateral transactions which refer to specific projects, as it has happened so far in the near-totality of cases. The initiative is intended to set up an entity combining the features of an assessment agency with those of a bank. This entity would act as a repository of CO₂ credits of whatever origin and, through adequate conversion rates, would issue "universal" credits, which might be purchased and sold on a trading platform.

Within the above-described context, Erga is completing one of the first and most important CO₂ credit transactions on the intercontinental arena. The credits were earned from renewable power generation in past years.

The transaction is part of a Canadian voluntary program known as PERT (Pilot Emission Reduction Trading), which is being implemented through CHI Energy.

The final stage of the process, i.e. credit certification by the designated authorities of the PERT program, is scheduled to take place by Autumn 2001.



A large, powerful ocean wave is shown crashing, with sunlight reflecting off the surface. The wave is a deep teal color, and the spray from the break is white. The background is a lighter shade of teal.

2000

Eco-Balance and Indicators

The eco-balance

In the Enel Group, electricity generation, transmission and distribution are the activities which have the most significant interactions with the environment. It will suffice to say that, in 2000, the remaining industrial activities of the Group (in particular in the telecommunications, gas distribution and hydraulic-structural sectors) and the management of its real estate involved a consumption of primary energy (electricity and fuels) and a production of waste about 1,000 times lower than electric activities alone.

The eco-balance quantifies the interactions between the Group's electrical activities and the environment.

The data in the eco-balance tables fall under three headings:

- resources;
- process and product (electricity), giving insight into the extent of the problem considered;
- emissions.

For each item, the tables show the data for the past five years and the percentage change recorded in 2000 on 1996 and 1999. The data are grouped into homogenous sets of activities, even if they are performed by different companies of the Group: on one hand, the generation activities conducted by Enel Produzione (together with the newly-established Valgen), Erga, Eurogen, Eletrogen and Interpower; on the other hand, the set of transmission and distribution activities, carried out by Terna and Enel Distribuzione (together with the newly-established Valdis), respectively.

Contrary to previous years, the 2000 data of Enel Distribuzione do not include the power grids that it has already divested in accordance with Legislative Decree no. 79 of March 16, 1999 on rationalization of the electricity distribution activity. These grids, which Enel Distribuzione owned in the Trieste and Parma Municipalities, were transferred to the municipally-owned companies. Consequently about 41,000 customers (0.14% of total customers) were lost.

The table below shows the data of the Group's power installations (as of December 31, 2000) that fall under the above-mentioned sets of activities.

Power plants

	Net maximum capacity (MW)	no.
Total	56,348	709
<i>hydro</i>	16,889	615
<i>thermal</i>	38,838	59
<i>geothermal</i>	595	33
<i>wind</i>	23	2 (<i>in addition to 2 test fields</i>)
<i>solar (photovoltaic)</i>	3	2 (<i>in addition to 1 test field</i>)

Power lines

	Circuit length (km)
Total	1,100,096
<i>high voltage</i> (40 to 380 kV)	57,620
<i>medium voltage</i> (1 to 30 kV)	331,793
<i>low voltage</i> (380 V)	710,683

The missions, features and 2000 highlights of each of the Group's companies are described in the data sheets enclosed hereto.

⁽¹⁾ The contribution of real estate was extrapolated from a sample of buildings in 14 large urban areas: Ancona, Bari, Bologna, Cagliari, Catanzaro, Florence, Genoa, L'Aquila, Milan, Naples, Palermo, Rome, Turin, Venice. Management of these buildings, where over 20,000 employees work (30% of the Group's personnel), is entrusted to Sei, a company of the Group.

Resources

		1996	1997	1998	1999	2000	%	
							2000-1996 1996	2000-1999 1999
Fuels								
fuel oil	thousand t	22,028	21,170	19,305	15,420	13,639	-38.1	-11.6
HS	thousand t	496	173	904	1,176	173	-65.1	-85.3
MS	thousand t	4,359	4,258	7,944	6,514	5,741	31.7	-11.9
LS	thousand t	14,558	13,239	5,237	3,530	4,114	-71.7	16.6
VLS	thousand t	2,615	3,500	5,220	4,201	3,610	38.1	-14.1
gas-oil	thousand t	135	62	90	209	136	0.5	-35.1
natural gas	million m ³	7,008	7,686	8,831	11,302	13,208	88.5	16.9
non-technologically captive use	million m ³	6,438	6,034	6,414	7,966	9,547	48.3	19.9
technologically captive use	million m ³	570	1,652	2,417	3,336	3,661	542.1	9.7
coal	thousand t	7,505	7,015	8,176	8,395	9,489	26.4	13.0
brown coal	thousand t	295	176	156	80	19	-93.7	-76.8
coke-oven gas	million m ³	58	62	1	0	0	-100.0	0.0
orimulsion	thousand t	-	1	693	1,689	2,508	-	48.5
TOTAL	thousand toe	32,347	31,712	31,880	31,046	32,083	-0.8	3.3
Geothermal steam	thousand t	31,034	32,108	34,201	35,339	37,500	20.8	6.1
Water for industrial uses								
from rivers	million m ³	12.4	11.8	11.1	11.1	10.8	-12.9	-2.6
from wells	million m ³	18.2	17.9	15.5	12.9	14.1	-22.5	8.8
from aqueducts	million m ³	4.9	5.3	4.8	5.5	5.8	17.0	4.5
TOTAL ABSTRACTION FROM INLAND WATERS	million m ³	35.5	35.0	31.4	29.6	30.7	-13.7	3.7
from the sea for direct use	million m ³	-	-	2.7	12.2	6.9	-	-43.7
from the sea after desalination	million m ³	3.6	4.0	6.5	8.0	8.7	140.7	9.3
from internal recovery	million m ³	1.5	1.7	3.1	4.1	3.6	136.8	-12.3
TOTAL REQUIREMENTS	million m ³	40.7	40.7	43.7	53.9	49.9	22.7	-7.4
Expendables								
resins	t	222	290	117	90	63	-71.8	-30.0
hydrazine	t	296	358	114	71	47	-84.3	-34.8
ammonia	t	177	2,878	8,969	15,482	18,703	10,466.7	20.8
limestone	t	-	12,428	178,393	333,275	325,150	-	-2.4
lime	t	5,414	6,399	9,034	12,135	14,005	158.7	15.4
soda	t	9,540	8,318	6,774	6,692	7,728	-19.0	15.5
sulfuric and hydrochloric acids	t	17,752	16,720	9,359	7,834	8,354	-52.9	6.6
bentonite	t	1,915	2,060	2,803	1,361	623	-67.5	-54.2
barite	t	289	441	362	6	8	-97.4	16.9
geothermal cement	t	6,105	4,185	5,819	2,748	1,545	-74.7	-43.8
other	t	14,538	11,881	10,369	7,319	9,985	-31.3	36.4

Process and product

million kWh

	1996	1997	1998	1999	2000	% 2000-1996 1996	% 2000-1999 1999
Electricity generation (net)	179,875	177,201	179,484	178,813	182,527	1.5	2.1
thermal	141,645	139,954	141,052	136,946	141,391	-0.2	3.2
<i>from fuel oil and gas-oil</i>	96,062	92,194	84,446	66,987	59,325	-38.2	-11.4
<i>from natural gas</i>	25,446	28,964	33,710	43,426	52,147	104.9	20.1
<i>from coal and brown coal</i>	20,028	18,676	21,016	21,872	23,316	16.4	6.6
<i>from coke-oven gas</i>	109	118	3	0	0	-100.0	0.0
<i>from orimulsion</i>	-	2	1,877	4,661	6,602	-	41.6
from renewables	33,372	32,460	32,459	35,488	34,660	3.9	-2.3
<i>geothermal</i>	3,533	3,672	3,958	4,128	4,415	25.0	7.0
<i>hydro from natural flows</i>	29,831	28,773	28,480	31,335	30,221	1.3	-3.6
<i>wind and solar</i>	8	15	21	25	24	200.0	-4.0
hydro from pumped storage	4,892	4,822	6,006	6,379	6,477	32.4	1.5
consumption for pumped storage	6,780	6,647	8,285	8,800	9,066	33.7	3.0
generation for consumption	173,095	170,554	171,199	170,013	173,461	0.2	2.0
Electricity purchases	-	-	-	77,608	66,077	-	-14.9
<i>from domestic operators</i>	-	-	-	35,978	40,956	-	13.8
<i>from foreign operators</i>	-	-	-	41,630	25,121	-	-39.7
Electricity sales	-	-	-	230,507	222,879	-	-3.3
on captive market	-	-	-	229,525	201,067	-	-12.4
<i>high voltage</i>	-	-	-	49,812	27,206	-	-45.4
<i>medium voltage</i>	-	-	-	79,080	70,612	-	-10.7
<i>low voltage</i>	-	-	-	100,633	103,249	-	2.6
on free market	-	-	-	982	21,812	-	2,121.2
<i>high voltage</i>	-	-	-	869	16,952	-	1,850.7
<i>medium voltage</i>	-	-	-	113	4,860	-	4,200.9

Emissions

source							% 2000-1996 1996 1999			
							1996	1997	1998	1999
Emissions into the atmosphere										
SO ₂	thermal generation	thousand t	536	484	489	404	354	-33.9	-12.2	
NO _x	thermal generation	thousand t	268	228	178	144	129	-52.0	-10.6	
particulates	thermal generation	thousand t	39	22	19	16	14	-64.4	-11.2	
H ₂ S	geothermal generation	thousand t	21	22	24	25	28	32.0	13.2	
CO ₂	<i>thermal generation (combustion)</i>	<i>million t</i>	104	101	101	97	99	-4.7	2.6	
	<i>thermal generation (desulfurization)</i>	<i>million t</i>	-	0.005	0.078	0.147	0.143	-	-2.4	
	<i>geothermal generation</i>	<i>million t</i>	1.669	1.612	1.794	1.794	1.900	13.9	5.9	
SF ₆	total	million t	106	103	103	99	101	-4.3	2.6	
	total	kg	n.a.	n.a.	n.a.	3,447	4,906	n.a.	42.3	
		thousand t of CO ₂ -equivalent	n.a.	n.a.	n.a.	82	117	n.a.	42.3	
Waste waters										
production	thermal generation	million m ³	27.2	25.9	25.1	27.1	25.9	-4.8	-4.4	
internal recovery	thermal generation	million m ³	1.5	1.7	3.1	4.1	3.6	136.8	-12.3	
Non-hazardous special waste										
coal bottom ash										
production	thermal generation	t	72,840	53,430	41,144	50,542	34,738	-52.3	-31.3	
delivery to recovery operators	thermal generation	t	58,670	46,511	37,733	50,097	34,265	-41.6	-31.6	
coal flyash										
production	thermal generation	t	843,451	720,490	842,701	839,411	952,367	12.9	13.5	
delivery to recovery operators	thermal generation	t	765,172	827,484	909,582	891,744	958,411	25.3	7.5	
gypsum from desulfurization										
production	thermal generation	t	-	11,880	275,651	509,294	562,220	-	10.4	
delivery to recovery operators	thermal generation	t	-	3,957	240,820	502,325	574,151	-	14.3	
other										
production	<i>generation transmission & distribution</i>	t	112,884	74,423	164,251	116,473	135,950	20.4	16.7	
	<i>total</i>	t	38,902	95,170	86,694	96,537	87,842	125.8	-9.0	
delivery to recovery operators	<i>generation transmission & distribution</i>	t	151,786	169,592	250,945	213,010	223,791	47.4	5.1	
	<i>total</i>	t	8,620	23,569	50,077	74,706	81,222	842.2	8.7	
	<i>generation transmission & distribution</i>	t	35,957	104,256	70,676	86,016	83,074	131.0	-3.4	
	<i>total</i>	t	44,577	127,825	120,753	160,721	164,295	268.6	2.2	

n.a.: not available

Emissions

source	1996	1997	1998	1999	2000	% 2000-1996		% 2000-1999	
						1996	1999		
Hazardous special waste									
fuel-oil ash									
production	thermal generation	t	31,185	39,576	55,205	40,520	27,588	-11.5	-31.9
delivery to recovery operators	thermal generation	t	1,346	5,857	15,440	16,172	4,393	226.4	-72.8
other									
production	<i>generation transmission & distribution</i>	t	3,794	9,902	6,186	6,995	6,882	81.4	-1.6
	<i>generation transmission & distribution</i>	t	4,744	5,680	9,432	6,222	4,472	-5.7	-28.1
	total	t	8,538	15,582	15,618	13,217	11,355	33.0	-14.1
delivery to recovery operators	<i>generation transmission & distribution</i>	t	n.a.	2,518	2,508	2,869	1,699	n.a.	-40.8
	<i>generation transmission & distribution</i>	t	n.a.	4,652	5,742	5,086	2,807	n.a.	-44.8
	total	t	n.a.	7,170	8,249	7,955	4,506	n.a.	-43.4
Other solid waste									
waste from geothermal drilling	geothermal generation	t	13,537	12,756	24,096	1,662	23,963	77.0	1,341.8
alluvial sediments removed from hydroelectric basins	hydro generation	t	n.a.	498,729	487,944	217,690	629,596	n.a.	189.2
fluvial debris and materials removed from the trashracks of hydro power plants	hydro generation	t	11,139	8,509	10,198	8,240	8,573	-23.0	4.0

n.a.: not available

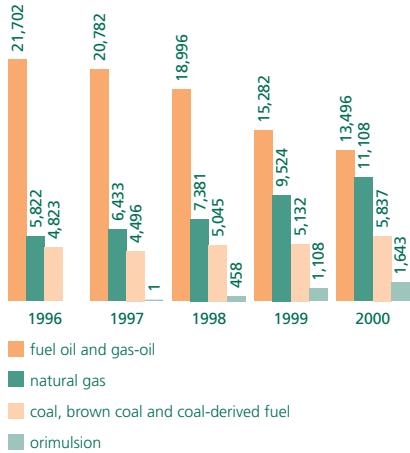
Notes to the eco-balance

This section elucidates the characteristics and modes of collection of the data shown in the eco-balance and, in some cases, provide comments on their trends.

Resources

Fuel consumption

thousand t of oil-equivalent



This heading refers to the consumption of energy sources (fuels, geothermal steam) and non-energy resources (water for industrial uses, expendables).

Fuels are 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 ≤2.5%; LS = low: >0.5% and ≤1.3%; VLS = very low: ≤0.5%).

Gas-oil, a high-cost fuel, is used on an exceptional basis in gas-turbine plants not connected to the natural gas grid, in diesel-engine plants (supplying some minor islands), in the start-up of steam-turbine plants, and as an emergency fuel in the other gas-turbine plants. Its maximum sulfur content (0.2%) is specified in the applicable legislation. However, Enel's gas turbines use gas-oil with a sulfur content of 0.05%.

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

With the exhaustion of the mines adjoining the Pietrafitta and Santa Barbara power plants, brown coal (imported) now has a marginal use (only in the Pietrafitta plant).

Orimulsion is an emulsion of bitumen in water coming from the Orinoco river basin (Venezuela).

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

With regard to trends, note the further decrease in total fuel-oil consumption in 2000 (mostly due to the radical drop in HS fuel oil) and the steady growth of natural gas, coal and orimulsion. The latter two fuels, which are used in power plants equipped with polluting emission abatement systems, mitigated the effects of the strong increase which was observed in 2000 in the prices of oil products and natural gas.

Geothermal steam is the energy source for geothermal generation.

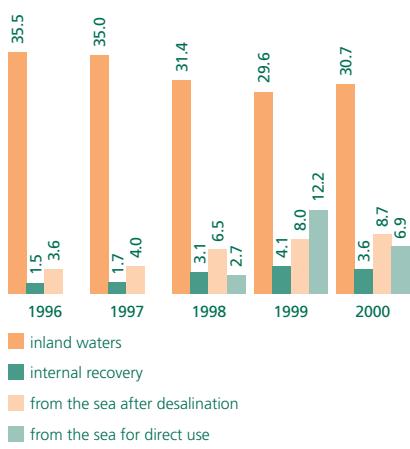
The amount used is measured with special instrumentation.

Its upward trend is the result of careful management of geothermal basins.

The capability of these basins (whose energy content is practically inexhaustible) is sustained by the injection of condensed geothermal steam, together with meteoric waters (from outdoor power plant areas), into the subsoil. This practice has also a high environmental value.

Abstraction of water for industrial uses

million m³



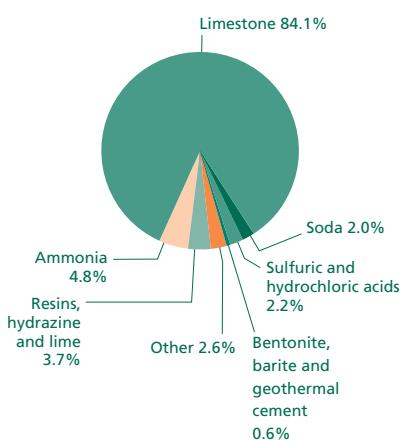
Water for industrial uses is consumed:

- in thermal power plants, mainly to make up for the amounts lost in the generation process of steam-turbine power plants and in closed-cycle wet cooling tower systems, to carry out clean-up jobs (especially of boilers), and to feed auxiliaries and desulfurizers;
- in geothermal activities, to prepare the drilling slurry.

The 1999 peak in water requirements (mostly covered by untreated sea water) is related to the particular requirements of the initial operation of desulfurizers. In effect, water requirements in 2000 declined significantly. The remaining variations are connected with ordinary operating fluctuations.

Expendables

2000 total: 386,210 t



Expendables complete the list of the resources used.

- Resins are used to produce (via ion exchange) the high-purity water which is needed for the thermal cycle of steam-turbine power plants.
- Hydrazine deoxygenates the thermal-cycle water and regulates its pH.
- Ammonia is the reagent for the flue gas denitrification process and is used to regulate the pH of the thermal-cycle water.
- 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.
- Soda, sulfuric acid and hydrochloric acid are most commonly used in clean-up of equipment. Nevertheless, 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 to make bentonite slurries heavier, thereby improving their effectiveness.
- Geothermal cement is used for joining the steel walls of wells and as a thickener of drill cuttings.

Other expendables include: i) sodium hypochlorite and ferrous sulfate, which are occasionally used as additives in the cooling waters of steam-turbine power plants, to prevent deposits and fouling and to protect heat-transfer tube surfaces from corrosion, respectively; and ii) magnesium oxide, which is injected into the flue gas circuit of boilers fed with vanadium-containing fuels, to prevent corrosion of heat-transfer surfaces due to the indirect action of vanadium.

The figures shown are obtained from the accounting records of purchases, which are held in each power installation site.

Observe the stabilization trend in the consumption of ammonia, limestone and lime. The strong increase in the use of lime after 1996 is connected with the treatment of desulfurizer drains. The consumption of the typical resources used for geothermal activities remains highly variable, owing to the characteristics of the geological formations crossed by the wells.

Process and product

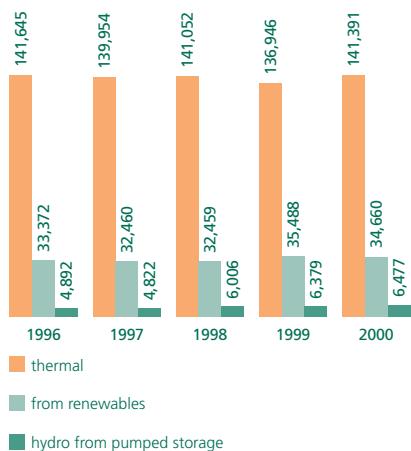
The split-up of the vertically integrated electrical activities of the Enel Group, the spin-off of its dispatching assets into GRTN (Gestore della Rete di Trasmissione Nazionale - Italian Independent System Operator), the start of the liberalized market have made it necessary to change the presentation of electricity flows into and from the grid. Consequently, the physical components of the tables presented in previous years have been replaced with commercial aggregates (own electricity generation, purchases and sales).

As a result of the above developments, the Enel Group has lost not only direct control over grid losses but also the possibility of measuring them. These losses, which have so far been expressed as a percentage of electricity demand and included among the indicators of power system efficiency, have thus been omitted.

Thanks to higher **electricity generation** (the contributions are net of the electricity consumed by power plant auxiliaries - the consumption of the auxiliaries of decommissioned nuclear plants until 1998 has been subtracted from total consumption) than in 1999, the Group covered a decrease in its total purchases of electricity.

Given the slight contraction in the contribution of hydro from natural flows (due to the natural variability of precipitation), this higher generation is mostly owed to thermal power plants. Note, in the latter plants, the expanding use of natural gas and the progressive decline of fuel oil. Also geothermal generation exhibits a progressive upward trend; commitment to this domestic source places the Enel Group (now with Erga) among the leaders on the international scene.

Net electricity generation by source million kWh



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 thermal generation surpluses in low-load hours). Pumped storage is the only available option for storing significant amounts of electricity, albeit indirectly. Net generation, after deducting electricity consumed for pumped storage, represents the generation available for consumption.

Total electricity purchases from third parties diminished significantly. In particular, the sharp reduction in purchases from other countries (as a result of the allocation of transfer capability to other operators) was paralleled by greater recourse to domestic operators. The latter operators increased their supply of power from renewables and "equivalent" sources as per resolution no. 6 adopted by CIP (Interministerial Committee on Prices) in 1992.

The year 2000 marks the start of the liberalization of the Italian electricity market, enabling "eligible" customers to choose their own supplier.

Enel's total electricity sales dropped slightly as against 1999. The drop occurred in the "captive" market (where the Group's players are Enel Distribuzione & Valdis) and was concentrated on high- and medium-voltage electricity supply. However, it was partly offset by a higher volume of sales on the free (eligible) market (where the Group's main operators are Enel Trade and Enel Produzione, the latter with a small share of the market).

Emissions

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

Emissions into the atmosphere which are typical of electrical activities are represented by sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulates, hydrogen sulfide (H_2S), carbon dioxide (CO_2) and sulfur hexafluoride (SF_6).

• SO_2 , NO_x and particulates originate from the combustion process in thermal power plants. The amounts shown include both emissions from large combustion plants (yearly reported to the Ministry of the Environment) and those from gas turbines. Their values are obtained by multiplying their concentrations in flue gases (mostly continuously monitored) by the volumes of flue gases. NO_x are expressed in terms of NO_2 -equivalent.

In 2000, Enel continued to curb these emissions, thanks to advanced combustion technologies, continuous tuning of combustion systems, progress in the installation/upgrading of flue gas abatement systems and use of low-sulfur content fuels.

• H_2S is the only potential pollutant with significant percentages in geothermal fluid. Its values are estimated on the basis of periodical sampling of fluid composition and of the related volumes dispersed into the atmosphere.

The rise in these emissions is due to the increase of geothermal generation.

• CO_2 is the typical product from combustion of all fuels. However, it is also contained, albeit in much lower amounts, in the reaction products from the desulfurization process and in geothermal steam.

The CO_2 from combustion is computed by applying the following emission factors (tons of CO_2 per ton of oil-equivalent) to the consumption of the various fuels: 4.03 for coal and coal-derived products; 3.27 for oil products; 2.35 for natural gas; carbon is thus considered as completely oxidized into CO_2 . The amount of CO_2 from the desulfurization process is computed stoichiometrically from the amount of limestone used. The CO_2 from geothermal steam is estimated with reference to periodical sampling of fluid composition. Whether the CO_2 from geothermal generation should or should not be included among anthropogenic emissions is the focus of an ample debate.

Reduction of CO_2 emissions on 1990

Italian target in the 2008-2012 period	Enel's result in 2000
-6.5%	-7.0%

- The emissions of SF₆ into the atmosphere are due to leaks from the equipment where it is used as an insulant and for electric arc extinction.

SF₆ emissions are computed through a complex procedure which takes into account the amounts replenished. This procedure enabled, from 1999 on, to give fairly reliable data on SF₆ emissions. The data confirm the order of magnitude of the amounts estimated in previous years.

Variability of SF₆ emissions over the years is attributable in particular to the occasional character of SF₆ replenishment jobs.

The amounts of SF₆ are expressed in weight of SF₆ and in weight of CO₂-equivalent (in terms of possible effect on global warming). The values expressed in CO₂-equivalent show that SF₆ emissions are low (about 1/1,000) vs. CO₂ ones.

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 recovered and in part returned to surface water bodies.

The quantitative data of waste waters are estimated by referring to the potential capability of water treatment systems, to their utilization and modes of operation.

As predictable, their trend - even in the case of internal recovery - is in line with the one of water requirements for industrial uses.

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

- The **non-hazardous** waste produced by Enel includes not only coal ash and gypsum from desulfurization, but also materials which are typical of electrical activities (machinery & equipment, their parts, supports of power lines, conductors, cables, sludges from water treatment, etc.) or materials of a general or exceptional nature (packaging materials, clothing, debris from construction and demolition, etc.).
- **Hazardous waste** comprises fuel-oil ash, materials which are typical of electrical activities (PCB-containing transformers and capacitors, their parts, batteries, used oils, sludges from condensation of geothermal steam, etc.) or of a general or exceptional nature (sludges, asbestos, etc.).

"Waste delivered to recovery operators" means the amounts of waste which is delivered to authorized operators of waste recovery plants (in some cases, the Enel Group itself; for instance, fuel-oil ash is used in part for energy recovery through co-firing with coal).

The waste data shown are those indicated in the yearly reports 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 materials.

The following trends emerge from the data:

- the production of ash is generally correlated with fuel consumption and characteristics but it reflects fluctuations that depend on: i) the frequency of ash removal from flue gas ducts and from the hoppers of boiler furnaces and of particulate collectors; ii) the addition of water to the ash to prevent the formation of particulates 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 decreasing ratio of bottom ash to flyash is to be ascribed to the growing practice of comminuting bottom ash to make it similar to flyash and thus facilitate its marketing;
- the production of gypsum, which is totally recovered for industrial and civil engineering uses, shows a stabilization trend after its increase in the past few years; the increase is due to the installation of flue gas desulfurizers, which had a substantial impact on overall waste production;

- the production of other non-hazardous waste generally depends on contingent circumstances (e.g. materials from demolition) and, in the past few years, on a higher volume of sludges from the process of treatment of desulfurizer drains;
- the variations in waste recovery in 2000 reflect those of waste production.

The following items are identified separately as **other solid waste**:

- cuttings from drilling of geothermal wells (the fast-evolving legislation governing this type of waste made it possible, in 2000, to fully reuse it for environmental restoration);
- alluvial sediments from desilting of hydroelectric basins (whose sharp increase from 1999 to 2000 is justified by the doubling of the number of desilted reservoirs) and materials removed from the trashracks placed near the intake structures of hydro power plants, because this waste is not directly produced by the industrial activities of the Enel Group.

Indicators

Indicators are used to analyze Enel's environmental performance over time, regardless of the "volume of activities" which are carried out 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 thermal generation](#) defines the average quantity of fuels which are consumed by thermal power plants to generate one kWh net.
- 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.
- 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 percentage variations over the entire period and in 2000 are very small. The slight increase in the net heat rate of thermal generation in the past two years is due to the calling-on of plants with a higher heat rate (in order to increase thermal generation) and to the electricity absorbed by the systems for the abatement of releases into the atmosphere. Observe also the growing efficiency in the utilization of geothermal resources.

- The [net specific requirements of water for industrial uses](#) express the amount of water consumed per kWh net of thermal generation. Their increase over the entire period is due to the operation of desulfurizers and is affected by the discontinuity which was recorded in the 1999 water requirements for industrial uses. However, this increase is minimum, if the contribution of sea water for direct use (main source for coverage of the water requirements of desulfurizers) is excluded.
- The percentage contributions to [coverage of the requirements of water for industrial uses](#) in 2000 (apart from the 1999 discontinuity) show a further generalized decrease of inland waters (rivers, wells and aqueducts).
- [Fuel consumption](#) displays a further drop in fuel oil - especially HS fuel oil - and a further rise in the contribution of natural gas and of natural gas combined with LS and VLS fuel oils.
- [Generation from renewables](#), expressed as a percentage of total electricity generation, evidences fluctuations which are due above all to the variable contribution of hydro generation. Conversely, geothermal generation has a steady growth.

Consumption of natural gas and VLS fuel oil
% of total fuel consumption



Indicators

			1996	1997	1998	1999	2000	%	
								2000-1996 1996	2000-1999 1999
Resource conservation and quality									
net heat rate of thermal generation	kcal/kWh		2,284	2,266	2,260	2,267	2,269	-0.6	0.1
net heat rate of geothermal generation	kcal/kWh		5,749	5,704	5,654	5,605	5,534	-3.7	-1.3
net efficiency of hydro generation from pumped storage	%		72.2	72.5	72.5	72.5	71.4	-1.0	-1.5
net specific requirements of water for industrial uses in thermal generation									
including sea water for direct use	liters/kWh		0.286	0.290	0.308	0.393	0.352	23.0	-10.5
excluding sea water for direct use	liters/kWh		0.286	0.290	0.289	0.304	0.303	6.0	-0.3
coverage of requirements of water for industrial uses									
from rivers	% of requirements		30.6	29.0	25.4	20.6	21.7	-29.0	5.2
from wells	% of requirements		44.7	44.0	35.5	24.0	28.2	-36.8	17.5
from aqueducts	% of requirements		12.1	13.0	11.0	10.2	11.5	-4.6	12.9
from the sea for direct use	% of requirements		-	-	6.2	22.7	13.8	-	-39.2
from the sea after desalination	% of requirements		8.9	9.9	15.0	14.8	17.5	96.2	18.0
from internal recovery	% of requirements		3.8	4.1	7.0	7.6	7.2	93.0	-5.3
fuel consumption (hydrocarbons)									
natural gas	% of total fuel consumption		18.0	20.3	23.2	30.7	34.6	92.4	12.9
non-technologically captive use	% of total fuel consumption		16.5	15.9	16.8	21.6	24.9	51.0	15.4
technologically captive use	% of total fuel consumption		1.5	4.4	6.4	9.1	9.7	555.7	6.8
fuel oil	% of total fuel consumption		66.7	65.3	59.3	48.5	41.6	-37.6	-14.2
HS	% of total fuel consumption		1.5	0.5	2.7	3.6	0.5	-64.8	-85.7
MS	% of total fuel consumption		13.1	13.0	24.1	20.2	17.3	32.2	-14.5
LS	% of total fuel consumption		44.1	40.9	16.1	11.1	12.5	-71.6	12.7
VLS	% of total fuel consumption		8.0	10.9	16.4	13.6	11.3	41.7	-16.7
natural gas + VLS fuel oil	% of total fuel consumption		26.0	31.2	39.5	44.2	45.9	76.8	3.8
natural gas + VLS & LS fuel oil	% of total fuel consumption		70.1	72.1	55.7	55.3	58.4	-16.7	5.6
generation from renewables									
geothermal	% of total generation		18.6	18.3	18.1	19.8	19.0	2.3	-4.3
hydro from natural flows	% of total generation		2.0	2.1	2.2	2.3	2.4	23.1	4.8
wind and solar	% of total generation		16.6	16.2	15.9	17.5	16.6	-0.2	-5.5
			0.0044	0.0085	0.0117	0.0140	0.0131	195.6	-6.0

Indicators

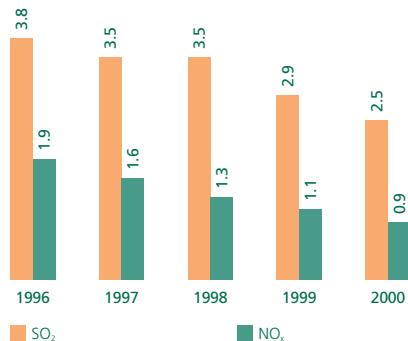
		1996	1997	1998	1999	2000	%	
							2000-1996 1996	2000-1999 1999
Net specific emissions from thermal generation								
SO ₂ /thermal generation	g/kWh	3.8	3.5	3.5	2.9	2.5	-33.8	-15.0
NO _x /thermal generation	g/kWh	1.9	1.6	1.3	1.1	0.9	-51.9	-13.4
particulates/thermal generation	g/kWh	0.28	0.16	0.14	0.11	0.10	-64.4	-14.0
CO ₂ /thermal generation	g/kWh	735	723	719	707	702	-4.4	-0.7
Net specific emissions from geothermal generation								
H ₂ S/geothermal generation	g/kWh	6.1	6.1	6.0	6.1	6.4	5.6	5.9
CO ₂ /geothermal generation	g/kWh	472	439	453	435	430	-8.9	-1.0
Net specific emissions from total generation								
CO ₂ (thermal)/total generation	g/kWh	579	571	565	541	544	-6.0	0.5
CO ₂ (thermal + geothermal)/total generation	g/kWh	588	580	575	551	554	-5.7	0.5
Avoided CO₂ emissions								
geothermal generation (net of typical emissions)	thousand t	927	1,043	1,050	1,124	1,200	29.5	6.7
hydro generation from natural flows	thousand t	21,916	20,806	20,468	22,150	21,218	-3.2	-4.2
generation from wind and solar	thousand t	6	11	15	18	17	186.7	-4.6
total	thousand t	22,849	21,860	21,533	23,292	22,435	-1.8	-3.7

Indicators

		1996	1997	1998	1999	2000	%	
							2000-1996 1996	2000-1999 1999
Specific waste production								
coal ash	g/kWh from coal	46	41	42	41	42	-7.5	4.0
fuel-oil ash	g/kWh from fuel oil	0.3	0.4	0.7	0.6	0.5	43.3	-23.1
Waste recovery								
coal ash	% of production	90	113	107	106	101	11.8	-5.0
<i>bottom ash</i>	% of production	81	87	92	99	99	22.5	-0.5
<i>flyash</i>	% of production	91	115	108	106	101	10.9	-5.3
gypsum from desulfurization	% of production	-	-	87	99	102	-	3.5
other non-hazardous special waste								
<i>generation</i>	% of production	8	32	30	64	60	682.4	-6.9
<i>transmission & distribution</i>	% of production	92	110	82	89	95	2.3	6.1
total	% of production	29	75	48	75	73	150.0	-2.7
fuel-oil ash	% of production	4	15	28	40	16	268.9	-60.1
other hazardous special waste								
<i>generation</i>	% of production	n.a.	25	41	41	25	n.a.	-39.8
<i>transmission & distribution</i>	% of production	n.a.	82	61	82	63	n.a.	-23.2
total	% of production	n.a.	46	53	60	40	n.a.	-34.1
Land								
LV cable lines	% of entire LV network	76.2	77.6	78.6	79.6	80.5	5.7	1.2
<i>overhead cable</i>	% of entire LV network	49.2	49.9	50.1	50.4	50.7	3.1	0.6
<i>underground cable</i>	% of entire LV network	27.0	27.7	28.5	29.2	29.8	10.6	2.2
MV cable lines	% of entire MV network	31.7	32.8	33.5	34.5	35.9	13.0	3.9
<i>overhead cable</i>	% of entire MV network	0.15	0.31	0.45	0.68	1.12	641.1	63.7
<i>underground cable</i>	% of entire MV network	31.6	32.5	33.1	33.8	34.8	10.0	2.7
double-circuit 380-kV lines	% of total 380-kV lines	8.8	8.7	8.4	8.7	8.7	-1.2	0.0

n.a.: not available

Net specific SO₂ and NO_x emissions g/kWh thermal (net)



Total specific CO₂ emissions g/kWh (net)



Net specific emissions

They express the amounts of substances which are released into the atmosphere per kWh net of electricity generated (thermal, geothermal or total).

Specific emissions represent:

- for SO₂, NO_x and particulates: the cumulative effect of the fuel mix, of the efficiency of thermal power plants and of direct prevention and abatement measures;
- for the CO₂ from thermal power plants: the cumulative effect of the fuel mix and of the efficiency of power plants (the contribution of desulfurizers is definitely marginal);
- for H₂S and CO₂ from geothermal generation: the cumulative effect of the composition of geothermal steam and of the efficiency of geothermal power plants.

All the trends of specific emissions from thermal generation show progressive reductions. By contrast, the different variability of specific H₂S and CO₂ emissions from geothermal generation depends on the characteristics of the geothermal steam used.

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 mix of energy sources.

Avoided CO₂ emissions

Avoided CO₂ emissions are an indicator of the environmental benefits induced by the mix of energy sources used for electricity generation and by the efficiency of the full cycle, from their utilization to electricity end-uses.

The CO₂ emissions shown were avoided thanks to electricity generation from renewables, rather than from conventional fuels.

These emissions are determined by multiplying the electricity generation from each renewable source by the average specific CO₂ emissions from thermal generation. In the case of hydro generation, reference is made to production from natural flows alone, excluding the contribution of pumped-storage plants. In the case of geothermal power, the CO₂ emissions typical of geothermal generation are subtracted from the result.

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

In 2000, thanks to the total avoided CO₂ emissions, the CO₂ emissions of the Enel Group accounted for about 80% of those which would have occurred without the use of renewables.

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 ash per kWh of the corresponding generation.

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

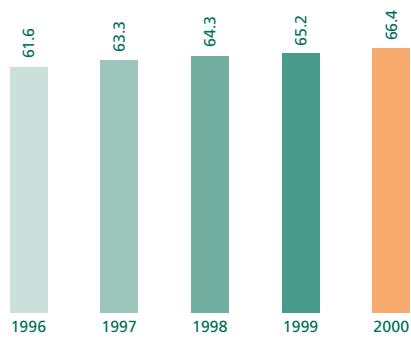
Waste recovery

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:

- full recovery of coal ash and of gypsum from desulfurization is a well-established practice;
- recovery of fuel-oil ash reversed its trend in 2000, owing to problems of fuel-oil ash intake in the markets of recovered materials (heavy metals);
- recovery of other non-hazardous waste and hazardous waste has appreciable values, albeit with contingent fluctuations.

Low- and medium-voltage lines in overhead and underground cables % of entire LV and MV grid



Land

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





2000

Occupational Health & Safety

Protection of health & safety in workplaces is integral to Enel's environmental policy and a fundamental value which rests on awareness, communication and assessment of risks and, above all, on the participation of workers in safety management.

Active involvement of workers is key to the strategies that the companies of the Group pursue in the area of risk prevention and protection; the "safety awareness" that they established among their workers contributes to their growth and success.

In spite of plenty of actions, upgrades and improvements, which resulted into acceptable quality levels, there are still many targets to be pursued, because achieving and maintaining health & safety in workplaces is a challenge that spurs the Group to work with ever-increasing effectiveness.

Initiatives for risk prevention, health protection and workplace hygiene

In line with its targets and taking into account the different characteristics of its workplaces (industrial sites, offices, warehouses, etc.), Enel pinpointed and analyzed the following categories of risk:

- possible risks that are intrinsic in the structure and type of workplaces;
- risks in terms of workplace hygiene, e.g. those connected with microclimate, air quality, lighting, etc.;
- horizontal risks, i.e. those related to working conditions, work organization, ergonomic and psychological factors, etc.;
- risks connected with the use of working equipment and in particular of computer screens.

On the basis of the identified risks, Enel went on with its risk prevention and protection program, by adopting measures not only in the physical environment, but also in the complex system of working conditions and of workers' interactions with workplaces, land and the environment.

The highlights of 2000 are as follows:

- ISO 9002 certification of Enel Produzione's central staff unit for occupational health & safety for its hygiene-health surveillance activities and for the provision of consulting services to third parties;
- completion of a pilot scheme for auditing safety management systems in hydro power plants: this is an extension of the scheme implemented in thermal power plants in 1998; a three-year audit scheme, covering all the thermal and hydro power plants of Enel Produzione, is planned to start in 2001;
- introduction of a safety management scheme in Enel Distribuzione: the scheme is underpinned by a methodology for auditing and continuously measuring improvements in working conditions and for identifying possible criticalities in safety management planning;
- Enel Distribuzione's completion of a nation-wide project concerning the possible impact of some activities on workers' health; the project was implemented on a significant sample of workers involved in:
 - maintenance of equipment typical of electricity distribution;
 - manual handling of loads;
 - use of equipment fitted with computer screens;
- issuing of guidelines for implementing Legislative Decree 334/99, transposing Directive 96/82/EC (on the control of hazards of major accidents involving dangerous substances) into the national legislation;
- ISO 9001 certification of Terna for engineering and maintenance of high-voltage power installations under safety conditions;
- constant preparation of safety plans for construction sites (as per Legislative Decree 494/96): these plans have become a well-established practice in some companies of the Group.

Protection and promotion of occupational health

In addition to "safety awareness", which has become a corporate asset, the companies of the Group also strived to build "health awareness" among their workers, i.e. encouraging them to adopt health protection measures, with a view to meeting the most stringent European and international standards.

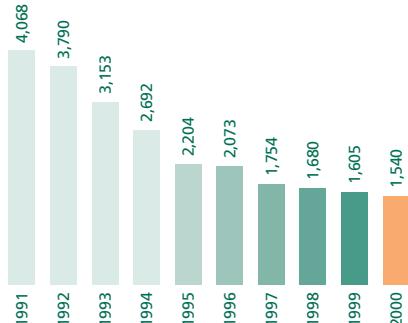
Among the most significant initiatives in 2000:

- extending the campaign of ambient and biological monitoring of polycyclic aromatic hydrocarbons (conducted jointly with some universities) to all thermal power plants;
- continuing efforts under the on-going agreement with EDF (Electricité de France) on the Eurelex research program (European project for identifying common methodologies of electricity companies to be applied to epidemiological surveys on the working population);
- application of a specific health protocol (examination of workers by specialist doctors, psychometric tests) to workers in charge of typically electrical activities (cable stringing, live maintenance).

Injuries

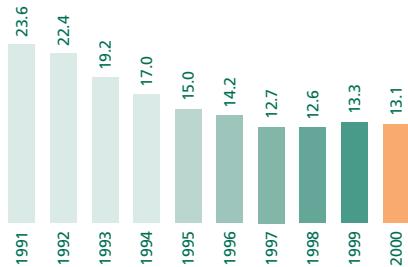
Injuries

number of injuries involving at least one day of absence from work



Frequency of occupational injuries

number of injuries per million hours of work



In 2000, the absolute number of injuries (events involving at least one day of inability to work) and their frequency (number of injuries per million hours of work) showed a downward trend.

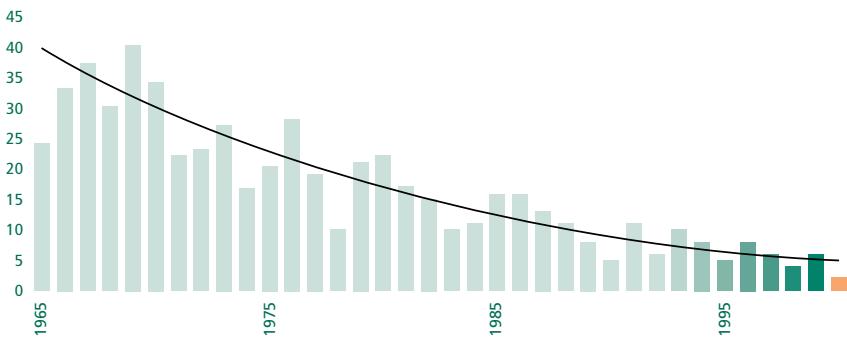
The improvements on 1999 were equal to 4% and nearly 2%, respectively. The frequency of injuries was down again after its 1999 increase.

Two fatal injuries occurred in 2000, one of an electrical nature and one due to falling from an elevated work area. This is the lowest figure recorded from 1965 to date.

In spite of the sharp drop in occupational injuries, the Enel Group is relentlessly committed to:

- decreasing injuries connected with its specific activities (electrical injuries and falls from elevated areas), by raising employees' awareness of and compliance with internal rules and regulations, including the use of personal protective equipment;
- continuing efforts of communication and awareness among its operational and functional levels, securing employees' commitment to minimizing even minor injuries, including those that are due to lack of attention.
- zeroing fatal injuries.

Fatal injuries



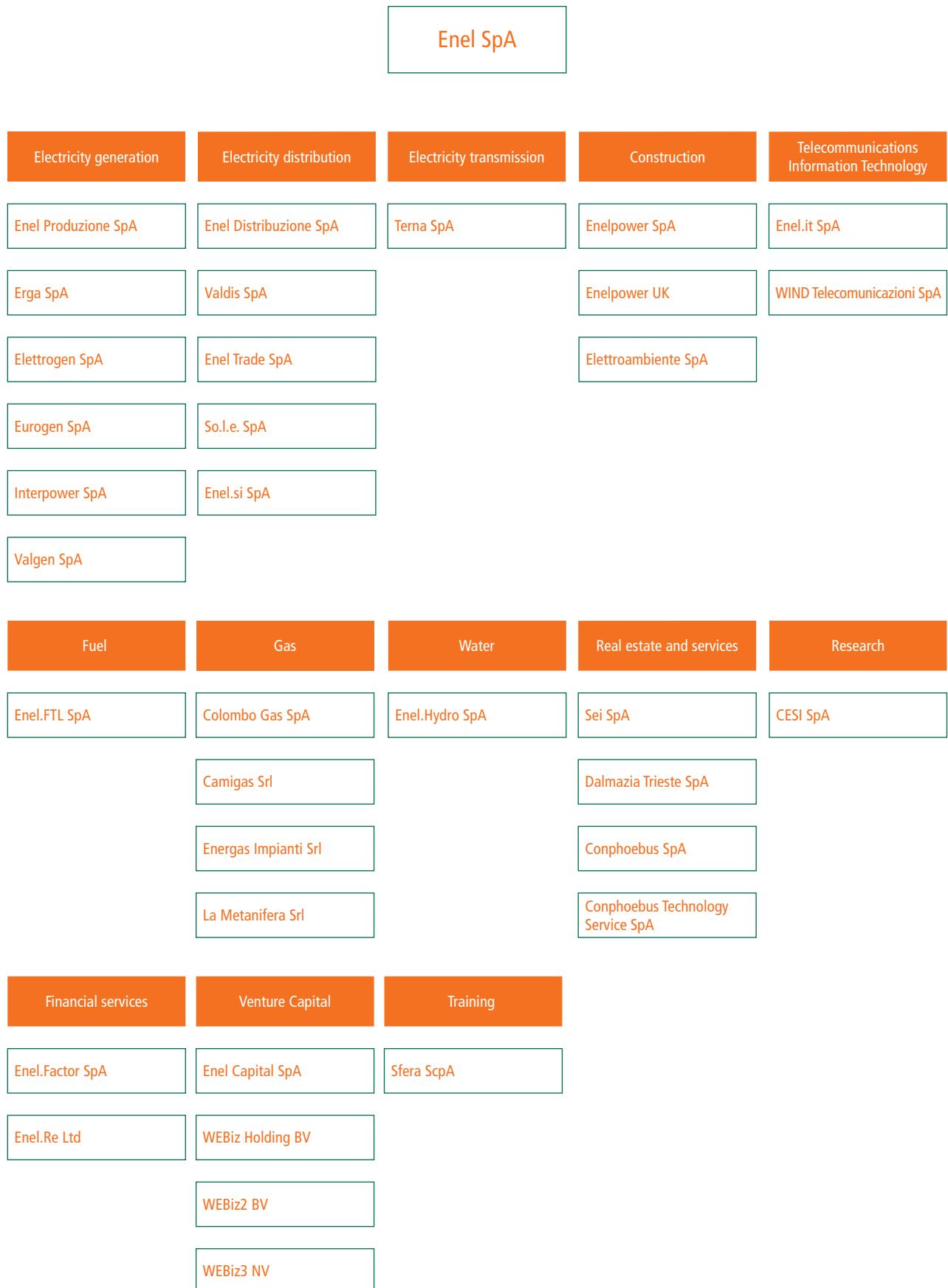


A large, mature green tree with a dense canopy stands in a grassy field. The sky is blue with some white clouds. In the background, there are more trees and a fence.

2000

Companies of the Enel Group

Enel Group



Data sheets of the Group's companies

The data sheets highlight the presence and environmental performance of the Enel Group in the various areas of business.

Also in 2000, the Group set up or acquired companies, such as Enel.FTL, Colombo Gas and Enel.Factor, demonstrating its strong dynamics.

The data sheets describe the missions of the individual companies, their environmental features and initiatives and, where applicable, the 2000 environmental data of their industrial activities.

Enel Produzione was set up on October 13, 1998. Its mission is to make available all the electricity required for covering demand at the least cost and in compliance with regulatory environmental and safety standards.

Competitiveness on the free market is the prime target of the company, which intends to respond to the new challenges and capture all market opportunities, by optimizing its generating capacity and achieving levels of efficiency comparable to those of major international operators.

Enel Produzione is equipped with technologically diversified power plants, both thermal (natural gas, fuel-oil, coal and orimulsion) and hydro (run-of-river, reservoir and pumped storage), which are distributed throughout Italy.

The organization of Enel Produzione over the country relies on four management areas, consisting of dependent business units (with thermal and/or hydro power plants), and on the two self-standing units of Trento and Bolzano (with their homonymous hydro groups).

Enel Produzione continued the phasing-in of environmental management schemes, obtaining the EMAS registration for its thermal plants of La Casella (Piacenza) and Torrevaldaliga Nord (Civitavecchia) and its hydro plants in the Cordevole valley.

In 2000, the company spun off its hydro generation assets in the Valle d'Aosta region into Valgen, which is controlled by Enel Holding, but planned to be transferred to the Valle d'Aosta regional authority under previous agreements.

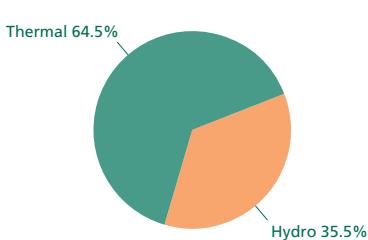
Workforce 10,884 members



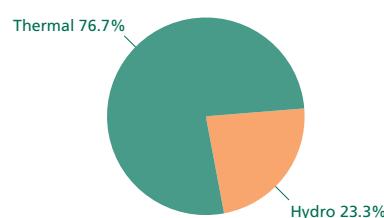
Power installations

	Power plants no.	Net maximum capacity MW		Power plants no.	Generating units no.	Net maximum capacity MW
Hydro						
Run-of-river	88	1,301	Thermal			
Pondage/reservoir	141	5,262	Steam	21	66	16,448
Pure/mixed pumped storage	19	7,510	Repowered with gas turbines	3	10	5,997
	248	14,073	Combined cycle	2	4	1,350
			Gas turbines	10	27	1,810
			Diesel	9	38	19
				45	145	25,624

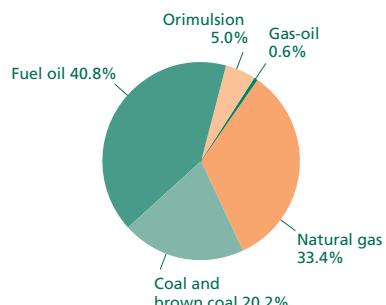
Net maximum capacity



Net electricity generation



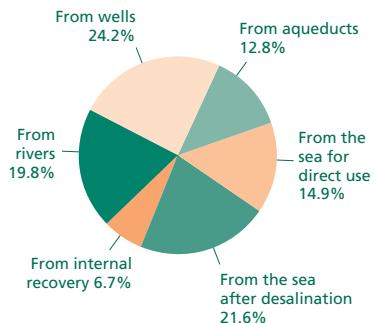
Fuel consumption



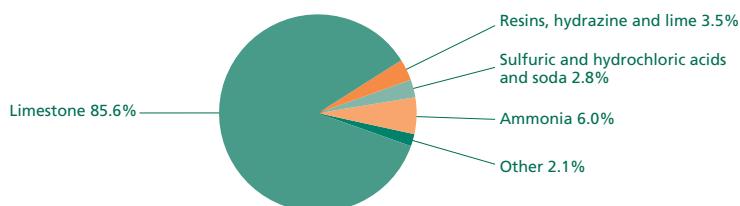
	Hydro	Thermal
Total (MW)	29,170	96,161
Total (million kWh)	29,170	96,161

	Total (million kWh)	Total (tons of oil-equivalent)
Total (MW)	125,331	21,739,000

Water for industrial uses



Expendables



Total requirements (m³)

34,495,000

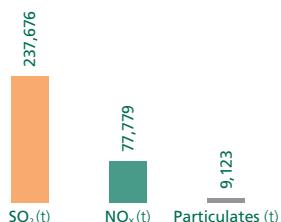
Total (t)

271,672

Total abstraction
from inland water (m³)

19,598,000

Emissions into the atmosphere



CO₂ (t)
from combustion
from desulfurization

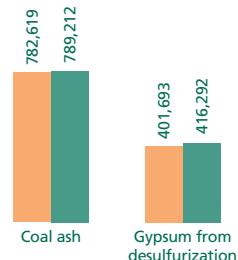
67,857,000
67,775,000
102,000

SF₆ (kg)
(tons of CO₂-equivalent)

750
17,900

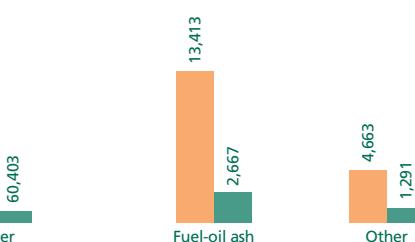
Hydro generation avoided the emission of about
15,957,000 tons of CO₂.

Non-hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Waste waters

Production (m³)
Internal recovery (m³)

16,554,000
2,311,000

Waste waters produced include meteoric waters which
are fed to treatment systems, if they are susceptible to
pollution.

Other data (hydro power plants)

Category	Value
Desilted reservoirs (no.)	8
Removed alluvial sediments (t)	601,574
Fluvial debris and materials removed from trashracks (t)	4,854

Category	Value
Fish ladders (no.)	8
Fish restocking campaigns (no.)	76
Restocked fish (individuals) in addition to (kg)	1,520,000 3,300

Erga (Energie Rinnovabili Geotermiche e Alternative - Renewable, Geothermal and Alternative Sources) was established on May 31, 1999. Erga, which pursues a strategy of national expansion, also acquired two foreign companies generating electricity from renewables: CHI Energy (261 MW installed in the US) and Energia Global International (246 MW in South America). With over 2,000 MW of total installed capacity, Erga ranks first in the world for generation of power entirely from renewables.

The organization of Erga over the country relies on 14 regional units, which have the task of

operating existing plants, capturing opportunities and developing initiatives.

The company, taking advantage of the opportunities offered by the new EMAS Regulation, started the process for certifying two of its regional units (one involved in hydro generation and the other in geothermal generation). Furthermore, at the beginning of 2001, Erga launched a major program of environmental restoration in the areas accommodating its geothermal plants.

Workforce 2,165 members

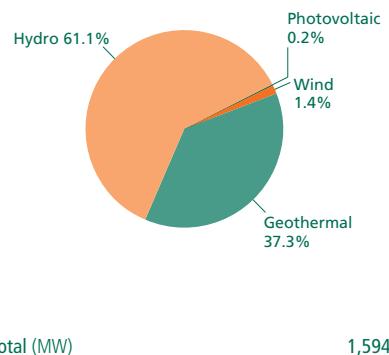


● Regional unit

Power installations

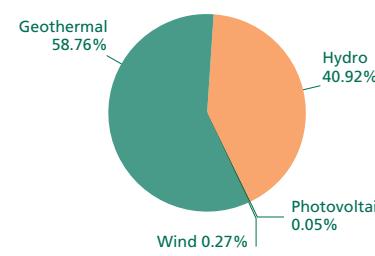
	Power plants no.	Net maximum capacity MW		Power plants no.	Net maximum capacity MW
Hydro					
Run-of-river	224	505.1			
Pondage/reservoir	56	467.9			
		280	973.0		
Geothermal					
	33	594.7			
		33	594.7		
Wind					
Power plants	2	20.3			
Test fields	2	2.4			
		22.7			
Photovoltaic					
Power plants	2	3.2			
Test fields	1	0.1			
		3.3			

Net maximum capacity

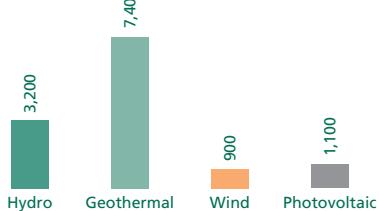


1,594

Net electricity generation



Hours of utilization by technology*



Consumption of geothermal steam

Total (t) 37,500,000

Hydro	3,074
Geothermal	4,415
Wind	20
Photovoltaic	4
Total (million kWh)	7,513

Average value: 4,700

* generation/capacity ratio ("power plants" only)

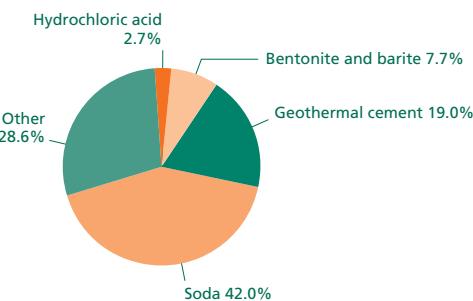
For details, apply to:
 Aldo Baldacci
 Via Andrea Pisano, 120 - 56123 Pisa
 Tel. no. +39-050535969 - baldacci.aldo@enel.it

Water for industrial uses

Abstraction from inland waters
 (rivers only, m³) 192,000

Abstraction of water to be used in the drilling of geothermal wells is limited and occasional, because the required water is obtained from a small portion of endogenous steam condensates. The remaining part of these condensates, together with meteoric waters, is reinjected into geothermal reservoirs. This practice has the advantage of recharging the geothermal reservoirs and of avoiding the production of waste waters.

Expendables



Total (t)

8,157

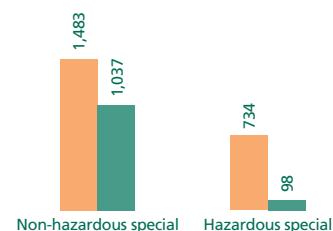
Emissions into the atmosphere

H ₂ S (geothermal, t)	28,000
CO ₂ (geothermal, t)	1,900,000
SF ₆ (kg) (tons of CO ₂ -equivalent)	57 1,400

Avoided CO₂ emissions

Hydro generation	2,154,000
Geothermal generation, net of CO ₂ emissions	1,200,000
Wind and photovoltaic generation	17,000
Total (t)	3,371,000

Waste



■ Production (t) ■ Delivery to recovery operators (t)

Other data

Geothermal power plants

Drilled wells	new (no.)	3
	rehabilitated (no.)	4
	deepened (no.)	0
Meters drilled		15,337
Drill cuttings (t)		23,963
In-service wells	for steam production (no.)	223
In-service wells for reinjection (no.)		34

Hydro power plants

Desilted reservoirs (no.)	5
Removed alluvial sediments (t)	27,440
Fluvial debris and materials removed from trashracks (t)	2,455
Fish ladders (no.)	22
Fish restocking campaigns (no.)	27
Restocked fish (kg)	2,100

Land used by wind and photovoltaic power systems

Wind system	Surface area occupied by machines, buildings, and roads (ha)	Total surface area affected by the installations (ha)
Collarmele plant	29.00	
Monte Arci plant	17.00	30 - 100 times larger
Acqua Spruzza test field	6.00	
Photovoltaic system	Surface area occupied by modules (ha)	Total surface area affected by the installations (ha)
Serre plant	7.00	12.00
Vulcano plant	0.21	0.43
Adrano test field	1.00	2.00

Eletrogen is one of the companies which were established on October 1, 1999 with the mission of contributing, together with Enel Produzione and other national operators, to the coverage of present and future Italian electricity supply requirements.

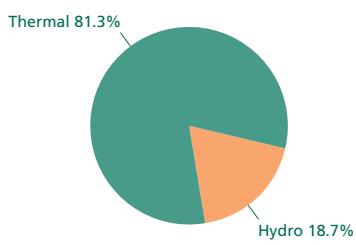
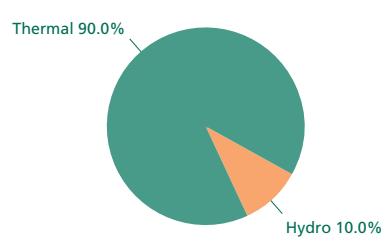
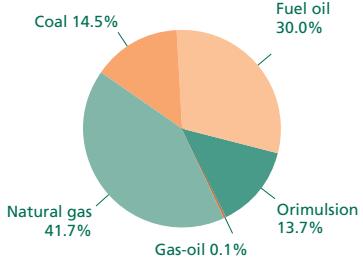
Under Legislative Decree no. 79 of March 16, 1999, Enel formulated a plan to spin off some of its power plants into three companies: Eletrogen, Eurogen and Interpower. Eletrogen operates power plants with a total capacity of about 5,400 MW.

In 2000, Eletrogen continued the phasing-in of environmental management schemes, achieving the EMAS registration for its thermal plant of Tavazzano (Lodi).

Workforce
1,633 members

Power installations

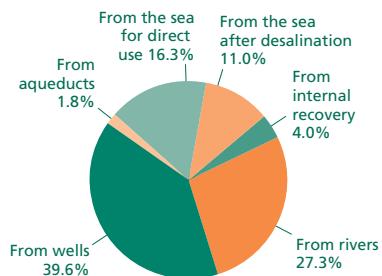
	Power plants no.	Net maximum capacity MW	Net		
			Power plants no.	Generating units no.	maximum capacity MW
Hydro					
Run-of-river	9	29			
Pondage/reservoir	15	985			
	24	1,014			
Thermal					
Steam	4		16		4,256
Gas turbines	1		2		168
			5	18	4,424

Net maximum capacity

Net electricity generation

Fuel consumption


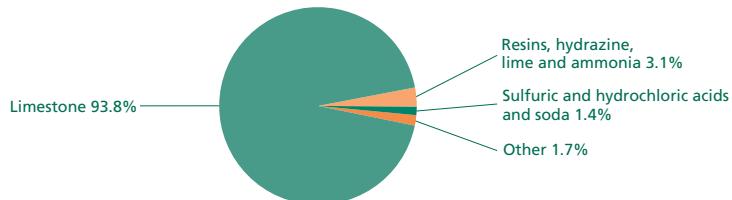
Hydro	1,971		
Thermal	17,665		
Total (MW)	5,438	Total (million kWh)	19,636

Total (tons of oil-equivalent) 4,017,000

Water for industrial uses



Expendables

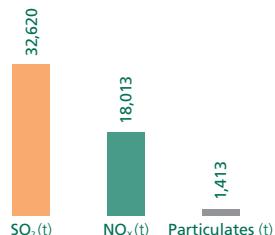


Total requirements (m³) 6,499,000

Total abstraction from inland waters (m³) 4,466,000

Total (t) 75,484

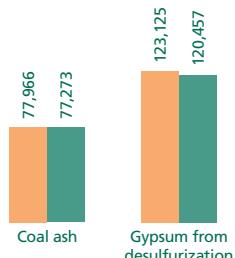
Emissions into the atmosphere



CO₂ (t)
from combustion
from desulfurization 12,067,000
12,036,000
31,000

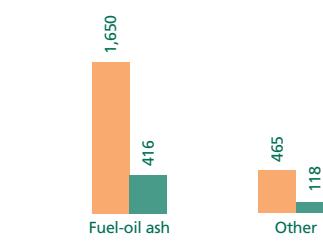
SF₆ (kg)
(tons of CO₂-equivalent) 135
3,200

Non-hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Hydro generation avoided the emission of about 1,374,000 tons of CO₂.

Waste waters

Production (m³) 3,752,000
Internal recovery (m³) 259,000

Waste waters produced include meteoric waters which are fed to treatment systems, if they are susceptible to pollution.

Other data (hydro power plants)

Category	Value	Category	Value
Desilted reservoirs (no.)	3	Fish ladders (no.)	0
Removed alluvial sediments (t)	582	Fish restocking campaigns (no.)	11
Fluvial debris and material removed from trashracks (t)	1,036	Restocked fish (individuals) in addition to (kg)	20,000 3,200

Eurogen is one of the companies which were set up on October 1, 1999 with the mission of contributing, together with Enel Produzione and other national operators, to the coverage of present and future Italian electricity supply requirements.

Under Legislative Decree no. 79 of March 16, 1999, Enel formulated a plan to spin off some of its power plants into three companies: Eletrogen, Eurogen and Interpower. Eurogen operates power plants with a total capacity of about 7,000 MW.

In 2000, Eurogen continued the phasing-in of environmental management schemes, achieving the EMAS registration for its thermal plant of Turbigo (Milan).

Workforce

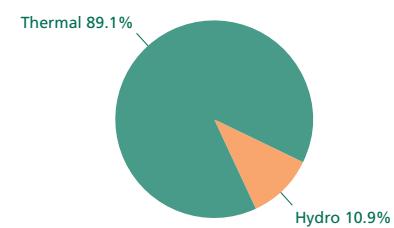
2,013 members



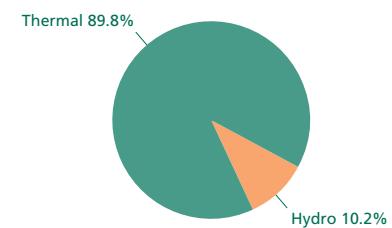
Power installations

	Power plants no.	Net maximum capacity MW		Power plants no.	Generating units no.	Net maximum capacity MW
Hydro						
Run-of-river	35	137	Thermal			
Pondage/reservoir	11	629	Steam	5	18	4,585
	46	766	Repowered with gas turbines	1	4	1,657
				6	22	6,242

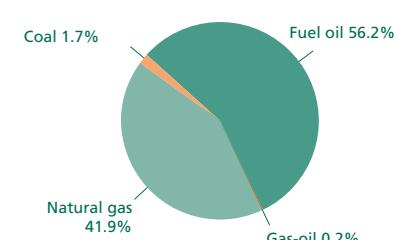
Net maximum capacity



Net electricity generation

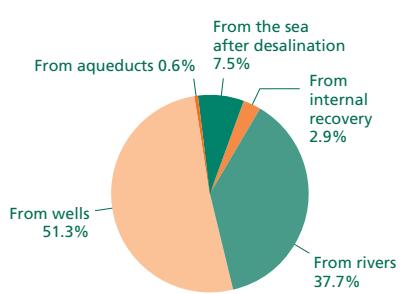


Fuel consumption

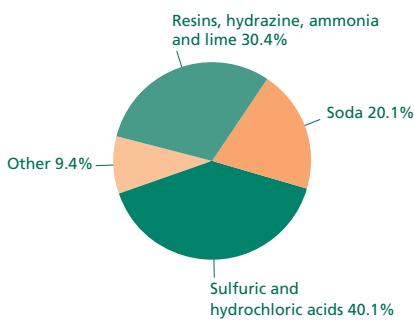


Total (MW)	7,008	Hydro	2,295	Total (million kWh)	20,176	Total (tons of oil-equivalent)	22,471	Total (tons of oil-equivalent)	4,521,000
------------	-------	-------	-------	---------------------	--------	--------------------------------	--------	--------------------------------	-----------

Water for industrial uses



Expendables



Total requirements (m³) 5,388,000

Total abstraction from inland waters (m³) 4,823,000

Total (t) 3,871

Emissions into the atmosphere



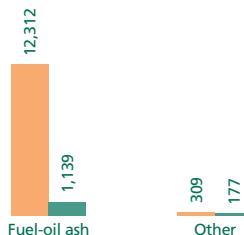
CO₂ from combustion (t) 13,097,000

SF₆ (kg)
(tons of CO₂-equivalent) 34
800

Non-hazardous special waste



Hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Hydro generation avoided the emission of about 1,602,000 tons of CO₂.

Waste waters

Production (m³) 3,029,000
Internal recovery (m³) 158,000

Waste waters produced include meteoric waters which are fed to treatment systems, if they are susceptible to pollution.

Other data (hydro power plants)

Desilted reservoirs (no.)	0	Fish ladders (no.)	0
Removed alluvial sediments (t)	0	Fish restocking campaigns (no.)	12
Fluvial debris and materials removed from trashracks (t)	213	Restocked fish (individuals)	138,000

Interpower is one of the companies which were set up on October 1, 1999 with the mission of contributing, together with Enel Produzione and other national operators, to the coverage of present and future Italian electricity supply requirements.

Under Legislative Decree no. 79 of March 16, 1999, Enel formulated a plan to assign some of its power plants to three companies: Elettronet, Eurogen and Interpower. Interpower operates power plants with a total capacity of about 2,600 MW.

In 2000, Interpower continued the phasing-in of environmental management schemes, achieving the EMAS registration for its thermal plant of Torrevaldaliga (Civitavecchia).

Workforce

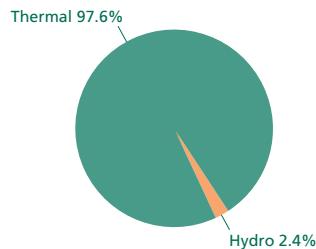
1,039 members



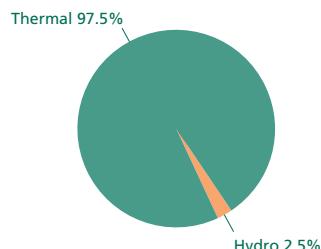
Power installations

	Power plants no.	Net maximum capacity MW	Net		
			Power plants no.	Generating units no.	maximum capacity MW
Hydro					
Run-of-river	11	28			
Pondage/reservoir	6	35			
	17	63			
Thermal					
Steam			3	10	2,548
			3	10	2,548

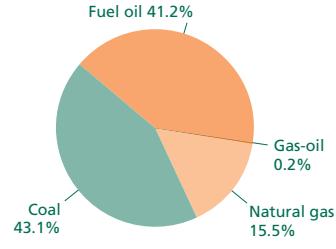
Net maximum capacity



Net electricity generation

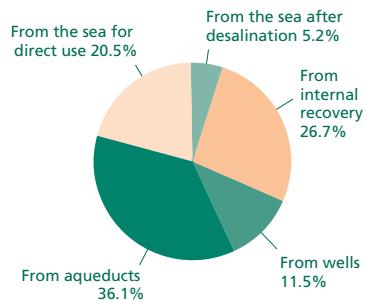


Fuel consumption



Hydro	187	Fuel oil	41.2%
Thermal	7,389	Gas-oil	0.2%
Total (million kWh)	7,576	Coal	43.1%

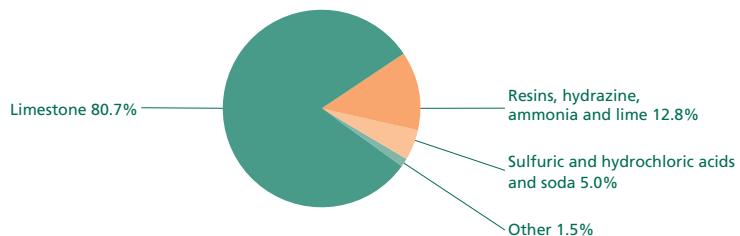
Water for industrial uses



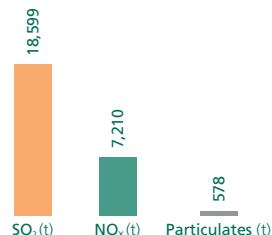
Total requirements (m³) 3,322,000

Total abstraction
from inland waters (m³) 1,581,000

Expendables



Emissions into the atmosphere

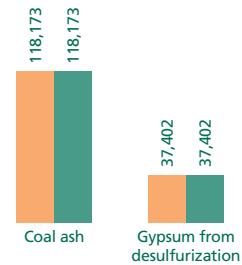


CO₂ (t)
from combustion
from desulfurization 6,248,000
6,238,000
10,000

SF₆ (kg)
(tons of CO₂-equivalent) 40
1,000

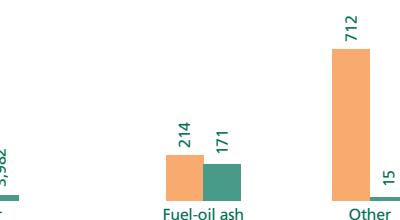
Hydro generation avoided the emission of about 131,000 tons of CO₂.

Non-hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Hazardous special waste



■ Production (t) ■ Delivery to recovery operators (t)

Waste waters

Production (m³) 2,551,000
Internal recovery (m³) 885,000

Waste waters produced include meteoric waters which are fed to treatment systems, if they are susceptible to pollution.

Other data (hydro power plants)

Desilted reservoirs (no.)	0	Fish ladders (no.)	2
Removed alluvial sediments (t)	0	Fish restocking campaigns (no.)	5
Fluvial debris and materials removed from trashracks (t)	15	Restocked fish (individuals) in addition to (kg)	50,000 400

Enel Distribuzione, established on May 31, 1999, has the mission of operating the distribution grid and of selling electricity to "captive" customers, delivering an excellent service at competitive costs and complying with the quality standards that are set by the Electricity Gas Regulator.

Enel Distribuzione spun off its assets in the Valle d'Aosta region into Valdis, a company which was set up on December 1, 2000. Valdis is controlled by Enel Holding, but planned to be jointly owned by Enel and the Valle d'Aosta regional authority. Enel Distribuzione provides a public-interest service to about 30 million residential, industrial, commercial and agricultural customers scattered all over Italy, from large towns to rural areas.

To achieve these goals, Enel Distribuzione initiated a wide-ranging program of reorganization of its processes, supported by technological innovation projects. With this program, the company expects to broaden the range and dramatically improve the quality of its services to customers.

Workforce¹ **44,072 members**



General data

Regional head offices ² (no.)	14
Operation centers ² (no.)	74
Zones ² (no.)	293
Customers ¹ (no.)	29,958,000
Electricity sales ¹ (million kWh)	201,067

Power installations¹

Substations	no.	Installed transforming capacity MVA	Lines (km)				
			Overhead bare conductors	Overhead cables	Underground cables	Total	
HV/MV	1,924	88,395					
Satellite substations and MV units	504	1,226	HV	19,937	-	467	20,404
MV/LV	344,627	64,930	MV	212,736	3,716	115,341	331,793
MV/MV	63,171	1,679	LV	137,970	360,751	211,962	710,683
	410,226	156,230	370,643	364,468	327,770	1,062,880	

Emissions into the atmosphere¹

SF ₆ (kg) (tons of CO ₂ -equivalent)	1,493 35,700
---	-----------------

Waste¹



■ Production (t) ■ Delivery to recovery operators (t)

¹Enel Distribuzione SpA + Valdis SpA

²Enel Distribuzione SpA

Enel Trade was established on May 31, 1999 to sell electricity to the so-called free ("eligible") market, which mainly consists of consortia and enterprises.

Enel Trade's mission is to provide its customers with competitively priced electricity and a wide array of additional services, offering flexible and customized solutions to suit the needs of any industrial customer.

In 2000, Enel Trade was the leader of the market, with a volume of sales close to 21 billion kWh (about 50% of the total), serving 1,513 sites, of which 1,131 belonging to consortia.

The business of Enel Trade has environmental relevance only to the extent that electricity plays a key role in sustainable development.

Its workforce includes 133 members.



● Headquarters

■ Regional office

So.I.E. was created on July 28, 1998 with the mission of designing, building and operating public and artistic lighting systems, in Italy and abroad.

In Italy, So.I.E. owns about 1,600,000 lighting points and serves over 5,500 municipalities.

So.I.E. offers a full range of products and services (public and artistic lighting systems, consulting for lighting projects and seeking of finance for their implementation) to municipalities, provincial and regional authorities, public entities and large companies.

So.I.E.'s organization over the country relies on 10 regional and 45 local units and a workforce of 330 members.



The target of So.I.E. is to illuminate towns, so as to improve the livability of the urban environment and to enhance its artistic and monumental heritage.

So.I.E. defined public-lighting standards for enhancing energy efficiency and mitigating the effects of light pollution. The company's methodological approach is based on lighting master plans that are aimed at creating adequately-lit and thus more secure outdoor environments.

So.I.E.'s artistic lighting projects are unique for their attention to the environment, through lamps and fixtures that do not disperse the light, thus avoiding light pollution and using energy efficiently.

The electric vehicle recharging systems (*Biberon*) that So.I.E. designs and develops for municipalities are featured by short recharging times and appropriate vehicle range between charges. Under the July 1999 agreement with the Ministry of the Environment (on environmental quality of urban areas), So.I.E. is in charge of: i) designing eco-recharge stations; and ii) giving technical support to municipalities whose transportation electrification plans are selected and funded by the Ministry of the Environment.

Furthermore, So.I.E. developed a system for real-time monitoring and collection of environmental pollution and local microclimate data that are critical to environmental rehabilitation and land monitoring projects (*Lanterna della Comunicazione* - communication lamp post).

A recent urban-design project of So.I.E. is the *Webtower*, a lighthouse/tower of integrated services. The tower not only provides combined lighting & telephony services, but is also a piece of urban furniture which gives character to and perfectly matches with the cityscape.

Enel.si, established on March 25, 1999, has the mission of delivering technological services to households and businesses, responding to their current demand for electric systems and to their emerging demand for safety, automation, efficient energy use, alternative energy sources and comfort in homes and workplaces.

The company's key areas of business are: design, construction, renovation, maintenance, operation, troubleshooting and any other activity ensuring full efficiency and reliability of electrical systems.

Enel.si serves its business customers (industry, major services and general government bodies) through a direct sales organization, and its mass market (residential, commercial and small business customers) through a network of highly professional and reliable franchising companies (whose number is expected to reach 2,500).

The activities of Enel.si have environmental relevance only to the extent that correct policies of construction and operation of beyond-the-meter systems and deployment of efficient electrotechnologies foster a safe and wise use of electricity.

Its workforce, including 56 members as of December 31, 2000, practically doubled in mid-2001.



Enel.si designs, develops and operates solutions that not only enhance energy efficiency but that also benefit the environment.

In 2001, the services of the company are expected to span from installation and operation of systems for air conditioning/heating via power-driven heat pumps to renewable-power and co-generation plants, development of electricity usage monitoring systems, installation of safety systems in homes and workplaces.

Terna, which was set up on May 31, 1999, inherited from Enel's Transmission Division the ownership of its transmission grid, while grid dispatching and operation were spun off into GRTN (Gestore della Rete di Trasmissione Nazionale - Italian Independent System Operator), a company controlled by the Ministry of the Treasury.

Terna's mission is to deliver an excellent power transmission service, ensuring the efficiency of its power installations and minimizing costs.

Terna operates & maintains power installations and extends the transmission grid in accordance with the specifications issued by GRTN and covered by an appropriate agreement.

Workforce **3,001 members**


Power installations

	no.	Installed transforming capacity MVA
--	-----	-------------------------------------

Electrical stations

380 kV	118	71,376
220 kV	106	23,738
<220 kV	37	3,062
261	98,176	

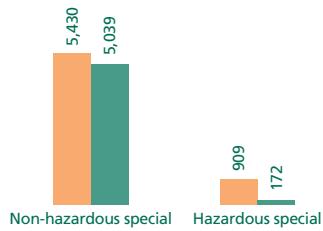
	Circuits km	Lines km
--	-------------	----------

Lines

380 kV	9,768	8,990
220 kV	9,486	7,924
<220 kV	17,103	16,172
220 kV c.c.	859	540
37,216	33,626	

Emissions into the atmosphere

SF ₆ (kg) (tons of CO ₂ -equivalent)	2,397	57,300
---	-------	--------

Waste


■ Production (t) ■ Delivery to recovery operators (t)

Enelpower was established on April 27, 1999. It has become fully operational since January 1, 2000, when it acquired Enel's Construction Unit personnel and activities (design, construction and commissioning of thermal power plants, power lines and transforming stations).

The company is based in Milan. In addition to serving the other companies of the Enel Group, Enelpower has taken up the role of independent operator on domestic and worldwide markets, with the following mission:

- to act as Engineering, Procurement and Construction (EPC) Contractor;
- to act as Power System Developer;
- to acquire holdings in new companies for construction of new power installations, by developing Build, Operate and Own (BOO) and Build, Operate and Transfer (BOT) initiatives.

The company has the goal of leveraging Enel's top-level skills, know-how and expertise, by making them available to new customers on the international electricity marketplace, also through alliances with strategic partners.

Its workforce includes 961 members.



The environmental, health & safety policy of Enelpower hinges on the following points:

- raising the awareness of environmental, health and safety issues among its designers, so that they become critical elements of their design choices;
- continuing its technical upgrades, so as to provide internal/external clients with innovative processes and technologies for mitigating environmental impacts;
- undertaking research & development efforts in order to optimize the integration of power installations into the environment and the landscape.

The environmental activities that Enelpower carries out for its internal client stem from general strategies formulated by the Group's top management, leading to contracts under which the Group's generation, transmission and distribution companies entrust Enelpower with design & construction of power installations or their retrofitting for environmental compliance purposes.

In 2000, to serve its internal clients, Enelpower retrofitted 5 thermal generating units for environmental compliance and completed environmental impact studies for new power installations on the transmission grid, including the Magenta and Pietrafitta electric stations and the 380 kV power lines of S. Giacomo-Teramo, Gorlago-S. Fiorano (alternative route of Concarena) and Laino-Rizziconi. The company also completed the project for undergrounding the cables that will connect the electric stations of Torrevaldaliga and Aurelia. Finally, Enelpower is building a plant for energy recovery from biomass at Cutro (Crotone).

Elettroambiente was established on January 15, 1996. Its prime mission is to develop initiatives, in Italy and abroad, for energy recovery from waste (municipal waste; special waste, particularly sludges; etc.) or from vegetal biomass (residues from crop growing and processing of agricultural produce, etc.).

To fulfill its mission, Elettroambiente maximizes waste recovery and reuse by producing energy from the combustible fraction of waste which would otherwise be unusable.



Elettroambiente conducted studies for design and construction of plants for energy recovery from municipal waste in some large urban areas and from biomass, assessing their benefits in terms of energy savings and mitigation of the greenhouse effect.

In the near future, Elettroambiente will also be actively present in waste processing, through the acquisition of Powerco, a company involved in electricity generation from waste, biomass and biogas, research on electronic sensors, heat generation and special materials. Through this deal Elettroambiente will become Italy's exclusive licensee of the PPV technology (owned by Global Plasma, a US company). The technology uses a plasma torch for ultra-high temperature gasification of waste. The synthetic gas so produced may, among others, feed combined-cycle turbines for electricity generation.

Enel.it is the Information Technology company of the Enel Group. The company, which was set up on October 15, 1999, inherited the assets of Enel's Information Systems Unit. Since January 1, 2000, Enel.it has been providing IT services for managing the business and administrative processes of the companies of the Group.

Enel.it has also the goal of competing on the market by offering the following services: engineering and development of integrated systems and solutions, outsourcing of central and distributed systems, and management of telecommunications network.

The company places emphasis on technological innovation, thereby contributing to optimizing the Group's activities in the areas of energy conservation, pollution control and occupational health & safety.

Enel.it gives an indirect contribution to environmental protection to the extent that telecommunications networks help reduce people mobility.

Its workforce includes 1,041 members.



In 2000, Enel.it produced 10 tons of non-hazardous special waste, which was totally delivered to recovery operators.

WIND, established on November 25, 1997, was the first initiative of the Enel Group for diversification and enhancement of its assets. The company, controlled by Enel SpA (majority stake: 56.63%), is the first telecoms operator in Italy - and among the first in the world - which offers convergence of fixed/mobile telephony and Internet services. Convergence is compounded by customized rate plans which respond to the different requirements of its users.

As of December 31, 2000, WIND had about 5,000,000 customers (12% market share).

WIND is equipped with 132 switches and 1,036 radio base stations (aerials for cellular telephony), in addition to about 4,500 telecommunications sites that Enel transferred to WIND upon its creation.

Its workforce includes 4,922 members.



On an extremely competitive market, environmental care is one of WIND's strategies for offering high-quality and advanced services: each network project is authorized by health authorities and local governments and implemented in environmentally sustainable ways.

In December 2000, thanks to its environmental performance, WIND became the first telecoms operator in Italy - and among the first in Europe - to obtain the ISO 14001 certification (after audits conducted by DNV, an international certification firm).

WIND's technologies minimize space requirements and thus visual impact. WIND selects different designs for its structures, depending on the features of the landscape. For instance, in urban areas, its aerials are very low (about 1.3 m) and mounted on very slim structures, whereas in sites of high architectural value its aerials are harmoniously integrated into the environment.

Enel.FTL (Fuels, Trading and Logistics) is the new company of the Enel Group established on December 30, 1999 for the purchase and sale of fuels, as well as for the delivery of logistic services to the generating companies of the Enel Group.

Operational since June 1, 2000, Enel.FTL has also the goal of capturing all business opportunities arising on the fuel market, by capitalizing on Enel's expertise in this sector.

In particular, Enel.FTL's mission consists of:

- *trading hydrocarbons and coal and providing the related logistic services, nationally and internationally;*
- *price risk hedging via adequate mechanisms;*
- *streamlining and optimizing the use of Enel's fuel facilities and storage areas and tapping their spare capacity in order to provide integrated logistic services to third parties.*

The company is headquartered in Rome and has a branch office in London. Its workforce includes about 100 members.



Enel.FTL places emphasis on environmental protection, health & safety. Its main environmental activities encompass:

- *determining the quality levels of the tankers used for maritime transport (both those directly chartered and those proposed by suppliers);*
- *checking compliance with international technical standards for the safety of maritime transport, with a view to protecting the marine environment;*
- *taking part in national and international activities concerning the safety of maritime transport.*

In 2000, Enel.FTL gave a major contribution to marine protection in the Strait of Bonifacio (between Corsica and Sardinia), requiring that chartered ships (or ships carrying its cargo) do not use the Strait. Furthermore, for the transport of orimulsion, the company only uses double-hull ships, i.e. the best available option.

On March 14, 2000, to continue its strategy of business diversification, the Enel Group acquired Colombo Gas SpA, a gas distribution company. Colombo Gas carries out its gas distribution business in various areas of Lombardy, Piedmont and Emilia Romagna (75 municipalities), both directly and through a controlling stake in three companies of the Camigas Group (Camigas Srl, La Metanifera Srl, Energas Impianti Srl).

In 2000, through its distribution network (about 1,300 km of gas lines, 39 high- to medium pressure stations and 727 medium- to low pressure stations), Colombo Gas delivered over 200 million cubic meters of natural gas to a total of 96,805 customers.

Its workforce includes 81 members.



● Headquarters

■ Field unit

Colombo Gas operates, controls and maintains its facilities in compliance with the applicable legislation and with the strictest quality and technical standards.

To this end, the company:

- periodically monitors its distribution network, in order to cut gas emissions into the atmosphere and guarantee an adequate level of safety of its facilities;
- places emphasis on environmentally sensitive areas (natural parks), where it minimizes the environmental impact of its structures;
- initiated projects of technological innovation of its facilities, by introducing computerized monitoring & control systems that mitigate customers' risks.

In 2000, the company used 294 toe of natural gas for heating (prior to delivery to customers, the gas to be distributed must be depressurized and thus heated in order to prevent its moisture content from freezing). Furthermore, it produced 8 tons of non-hazardous special waste (scrap).

Enel.Hydro, set up on February 18, 2000, inherited Enel's assets and know-how in hydro power generation and water management and ISMES skills in water structure design & engineering support services.

Enel.Hydro has the mission of developing business in design, construction and operation of water supply systems.

Enel.Hydro's activities for an Integrated Water Supply Service will be supported and maximized by its consolidated expertise in structural engineering and environmental protection.

Integration of services (engineering, experimentation, digital approach) enables Enel.Hydro to tackle complex problems with significant strengths in environmental conservation and protection.

Enel.Hydro's workforce includes 547 members.



● Headquarters ■ Commercial office

Enel.Hydro takes a multi-disciplinary approach to land conservation and environmental protection, using leading-edge technologies and providing the following services:

- soil protection and prevention of natural risks;
- monitoring and prevention of hydraulic risks;
- characterization and remediation of polluted sites;
- structural, static and seismic safety of large civil engineering structures (dams, tunnels, canals);
- environmental impact assessment.

Among its 2000 highlights:

- preliminary project for full rehabilitation of the sewage conveyance and treatment system in the urban areas of the Sarno basin;
- prevention of hydrogeological risk in the Municipality of San Felice al Cancello (Caserta) and study of landslides at Becca di Nona (Aosta).

In 2000, Enel.Hydro used 30,000 m³ of water in its testing tanks and consumed 900,000 kWh of electricity for the related pumping, as well as another 239,000 kWh for dynamic tests on materials. Furthermore, it produced 302 tons of non-hazardous special waste, 134 of which were delivered to recovery operators.

Sei, created in February 1993, took over the management of Enel's real estate.

In addition to managing Enel's real estate and enhancing its value, SEI is active in facility management (provision of building services, such as maintenance, cleaning, catering, etc.), hiring of vehicles and handling of materials.

In 2000, to implement this strategy, SEI launched the following initiatives:

- creation of a joint venture (Immobiliare Foro Bonaparte) with American Continental Properties, involving the transfer of one of Sei's arms (chiefly office buildings worth 928 billion lire);
- creation of a joint venture (Immobiliare Rio Novo) with Deutsche Bank, involving the transfer of other buildings worth about 750 billion lire;
- setting-up of Conphoebus Technology Service (CTS), a company jointly owned (with equal stakes) by Sei and Mitsubishi Electric Europe; the company will deliver full-range services to the open-space office buildings of the Enel Group and services of engineering, construction and start-up of air conditioning/heating systems to the large customers of Mitsubishi Electric in Italy.

Its workforce includes 1,334 members.



In 2000, Sei went on with the program of rationalization of its office buildings, creating over 12,000 open-space offices. This choice involved: i) the complete renovation of their technological systems (electricity, air conditioning, water and fire prevention); and ii) the replacement of their old furniture with new ergonomic furniture, in compliance with the safety standards of the latest European legislation. The dominant use of high-efficiency power-driven heat pumps for air conditioning/heating systems, or the conversion of other heating systems from gas-oil to natural-gas firing, helped curb emissions into the atmosphere.

Also the removal of asbestos from coverings and pipings (especially from the sheds used as warehouses) helped mitigate the environmental impact.

Replacement and streamlining of Enel's vehicle fleet gave a further contribution to the reduction of releases into the atmosphere.

In 2000, in the area of handling of materials, Sei decreased the number of warehouses/depots to as little as 11. In this way, Sei simplified and integrated methodologies and processes, facilitating the handling of materials and reaping benefits in terms of occupational safety and environmental protection.

Conphoebus has been part of the Enel Group since 1980.

It was established with the mission of operating in the areas of efficient energy use and renewables. Now, Conphoebus is an engineering, consulting and specialist service company. The Company delivers consulting services for buildings and systems involving the application of:

- innovative technologies for air conditioning & heating;
- methodologies for energy management of buildings;
- bio-architecture criteria;
- integrated solar energy and photovoltaic systems.

Conphoebus works synergistically with Erga in the provision of services to the Group and to third parties.

In 2000, it transferred some of its assets to Conphoebus Technology Service (CTS), a company jointly owned (with equal stakes) by Sei and Mitsubishi Electric Europe.

With this move, its workforce dropped to 36 members.



In 2000, the main environmental initiatives of Conphoebus were:

- feasibility study and operational guidelines for improving air quality, temperature and humidity in residential, commercial & institutional buildings through the application of electrotechnologies;
- innovative and energy-efficient solutions for the building envelope (SMART WINDOWS);
- concerted Mediterranean action for the use of renewables and correct management of water resources (MEDPOL);
- development of software (for Enel Distribuzione) for assessing the opportunities offered by the installation of heat pumps in residential buildings.

Since January 1, 2000, Enel has spun off its Milan-based research facilities into CESI. The shareholders of CESI include major national electricity operators.

CESI's mission is:

- to be the reference operator for research on the national power system;
- to acquire national and international leadership on the electricity-energy market, by developing innovative projects and solutions and providing specialist services.

CESI's activities are carried out by seven Business Units:

- Generation processes;
- Transmission & distribution grid;
- Industrial services, end uses, renewables;
- Environment;
- Tests and components;
- Certification;
- Automation.

Its workforce consists of 968 members, 115 of whom are environment-dedicated.



The research activities of CESI's Environment Business Unit have the purpose of gaining greater insight into the interactions between the power system and the environment in view of sustainable development. The Business Unit performs functions and delivers services of different type in the following areas.

- Land: management of geographic information system; environmental impact studies; issues of environmental economics and management; analyses and experimentation of environmental technologies; studies, data collection, monitoring and analyses for mitigating electromagnetic fields; continuous monitoring of the Po River waters.
- Atmosphere: monitoring of emissions, atmospheric modeling studies, operation of a greenhouse gas monitoring station on the Monte Rosa, air quality monitoring and restoration plans.
- Chemical analyses: studies on environmental matrices.
- Meteorology: monitoring and forecasting of atmospheric events, with real-time data on lightnings and storms over the country.

In 2000, CESI's laboratories consumed 15 million kWh of electricity and 159,000 m³ of water. The company produced 393 tons of non-hazardous special waste and 29 tons of hazardous special waste; of these amounts, 318 and 24 tons, respectively, were delivered to authorized recovery operators.

Enel.Factor, established on May 31, 2000, is the factoring company of the Enel Group. Its mission is to facilitate credit management and debt collection.

Enel.Factor establishes continuous relations with enterprises to assist them in administrative, organizational and financial functions concerning credit management.

It provides an extensive spectrum of combined or separate services:

- financial planning;
- factoring "pro soluto" (without recourse) with certification;
- factoring "pro solvendo" (with recourse).

The activities of Enel.Factor have no environmental relevance. However, Enel.Factor is aware of the importance that the Enel Group attaches to environmental care. Consequently, it does not exclude the future possibility of establishing priority relations with enterprises that provide specific services for enhancing environmental performance in all fields of activity. Enel.Factor's workforce includes 6 members.



Sfera (Società per la Formazione e le Risorse Aziendali) was set up on October 28, 1999 with the mission of educating & training the employees of the Enel Group and of developing their skills.

Sfera's attention to the environment translates into focused courses for newly-hired employees; the courses are intended to build awareness of the environmental issues connected with power generation, transmission and distribution.

To increase the dissemination of its services, Sfera developed the Enel Distance Learning System (EDLS), which allows employees to benefit of customized learning plans.

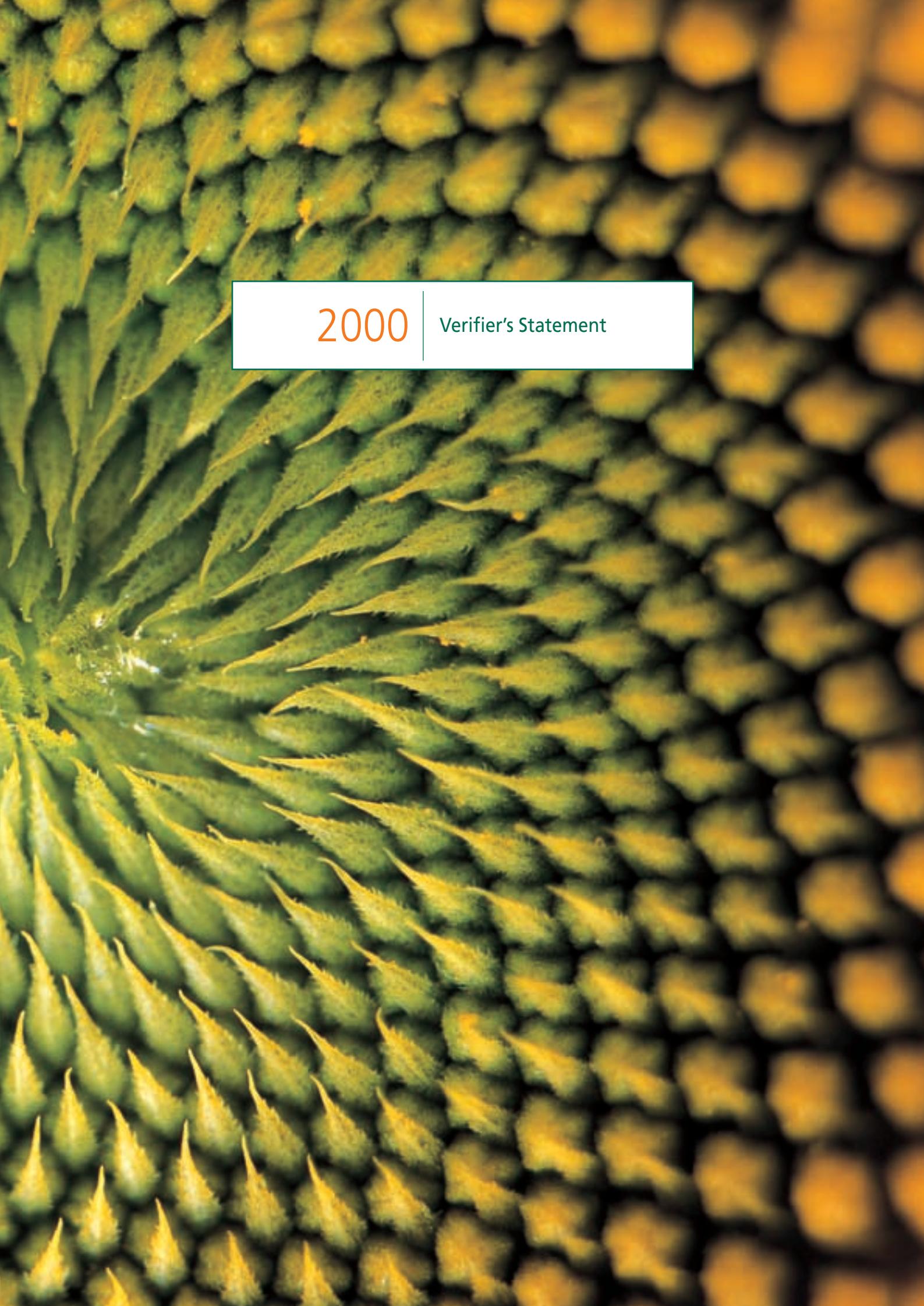
Sfera's workforce includes 60 members.



● Headquarters

■ Field office



A close-up photograph of a sunflower head, focusing on the intricate spiral pattern of seeds. The seeds are arranged in a logarithmic spiral, starting from a central point and moving outwards in a series of curves. The colors of the seeds vary from a bright yellow at the center to a darker green towards the edges. The background is a soft, out-of-focus green and yellow.

2000

Verifier's Statement

ENEL'S 2000 ENVIRONMENTAL REPORT VERIFICATION

The present statement contains the results of the verification performed by Ernst & Young on the Enel S.p.A.'s 2000 Environmental Report.

The verification has been conducted in accordance with the Guidelines for Environmental Report Certification defined within the Forum promoted by FEEM and Ernst & Young. The main objectives have been to verify:

- the reliability of the environmental data management system and the adequacy of corporate collection, collation and filing procedures;
- the completeness of the report with respect to data and information concerning the most significant impacts of Enel's activities;
- the comprehensibility of the report in terms of readability of data and information.

The verification process has been performed at Holding level, where the collection of data and the preparation of the report have taken place. Visits have also been performed at company level. Within Enel Produzione, the following were visited: the management unit La Spezia (Genova and La Spezia thermal power plants); the management unit La Casella (thermal power plant of Trino Vercellese); the management unit Priolo Gargallo (thermal power plants of Priolo Gargallo and Augusta, the Catania hydro group); the Termini Imerese management unit (thermal power plant of Porto Empedocle); the Montorio al Vomano management unit (Montorio hydro group). For Eurogen, the thermal power plants of Chivasso and S. Filippo del Mela were visited, as well as the Mese hydro group. For Eletrogen, the Tavazzano thermal power plant and the Catanzaro hydro group were visited. Concerning Interpower, the Genova hydro group was visited. Within Erga visits were performed on the Piancastagnaio geothermal regional unit and Ascoli hydro regional unit. For Terna, the regional head office Firenze was visited. Within Enel Distribuzione, the regional head office Piemonte was visited. Visit was also performed on the company Valdis. Prior to the above mentioned site visits, meetings were held with personnel responsible for environmental issues at company level.

The verification process has involved an examination of the data collection, collation and aggregation procedures implemented at Holding and company level. The process has involved the analysis of a sample of documents as well as meetings and interviews with the personnel involved in such issues, in accordance with E&Y and ASTM (E 1527-97) standards. The verification was not aimed at performing a specific data audit and, as a consequence, this statement is not to be considered a certification of the data contained in the Report.

Following Enel's reorganisation process, the new organisational structure maintained the existing environmental data management system, guaranteeing the reliability of generated data. This achievement required effort and professionalism on behalf of involved personnel. Concerning the above system, although the verification activities have indicated its general adequacy, specific problems regarding waste data management have been detected as well as discrepancies associated with methodologies used within different data management phases. For this reason, the definition of Group guidelines and associated company operational procedures is advisable, allowing the implementation of homogeneous data management activities and tools.

Concerning the Environmental Report, worth of notice is the further effort to take into consideration communication needs. This has been achieved through a more adequate subdivision of contents and increased readability. Implemented actions and obtained results are clearly presented, also in relation to significant issues such as energy efficiency and use of renewable sources. Data and information concerning the most significant environmental impacts associated with the Group's activities is exhaustive and consistent with the requirements of the main international and national guidelines on environmental reporting.

As mentioned for the 1999 edition, data concerning water resources should be introduced. Furthermore, the different companies' objectives as well as the actions undertaken for their achievement should be presented more clearly.

Overall, we consider the 2000 Environmental Report positively. Both the reporting methodologies and the evolution in the Report's structure and contents demonstrate the Group's effort aimed at controlling its environmental performance, coherently with its objectives regarding sustainable development.



Stefano Dionisio

Managing Director
Environmental Division

Rome, July 12, 2001

Graphic design
Tatjana Besekau & Skate

Photographs
Sie, Panda Photo, Enel's files

Publishing service
GI Grafica Internazionale
coordination:
Francesco Valerio Bocci

Translation
Stefania Saraceni

Proof-reading
Paola Urbani, Giacomo Trogu

Printed by
Ugo Quintily - Acilia (Roma)

Printed in October 2001

All data are referred to Dec. 31, 2000

Printed on ecological paper
(Fedrigoni Tintoretto Stucco)



Publication not for sale

