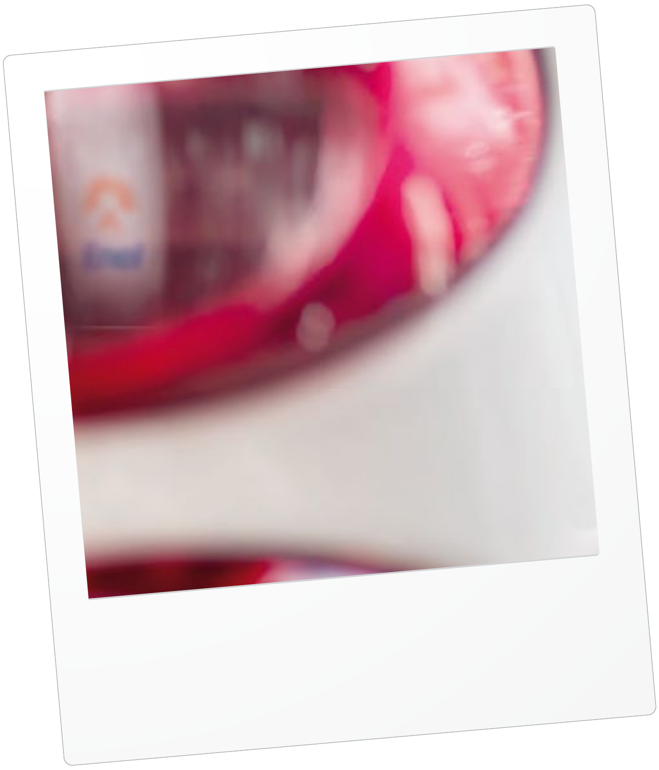
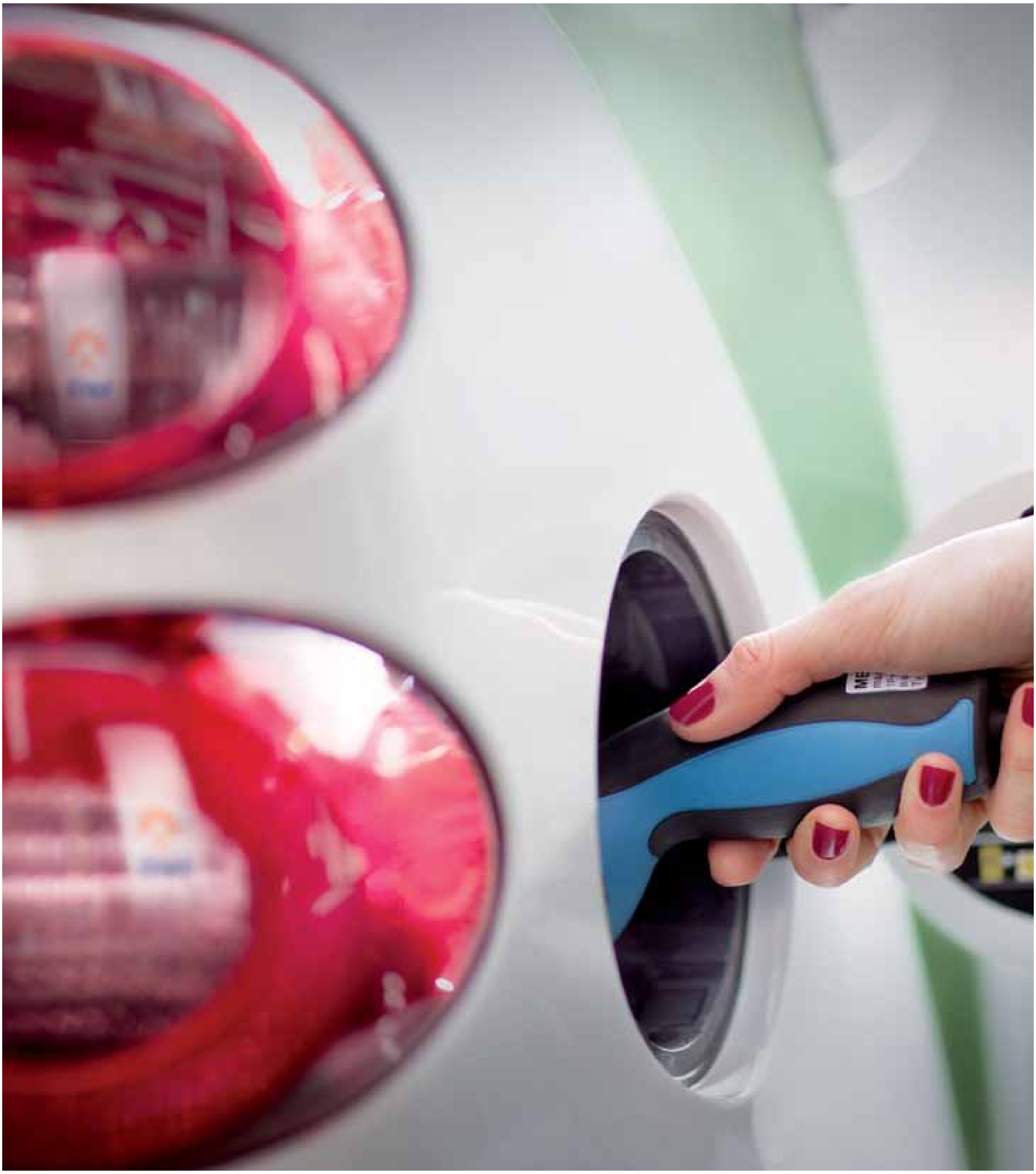
Environmental Report 2011



Enel

FIFTY YEARS

1962 2012



FIFTY YEARS

1962 2012

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CEO's message

In 2012, we will celebrate our 50th anniversary. Over the years, Enel has become one of the most important energy companies in the world. I am proud to state that our broad experience has led us to set an example of excellence in environmental stewardship. We believe that care for the environment is an opportunity, strategically and in terms of operating efficiency. It is a deeply felt choice, which is dictated not only by the increasingly stricter rules governing our sector, but also by our respect for those who work for us and for the communities hosting our operations in 40 countries of 4 continents.

During 2011, the issues of environmental sustainability and of the fight against climate change remained high on the international agenda, although it has been an extremely difficult year, both economically and politically. The European Union went ahead with its initiatives, such as the "Roadmap to a Resource-Efficient Europe", with a view to steering the development of its member countries towards an efficient use of resources. At global level, preparatory work began for a momentous event, the Rio+20 United Nations Conference on Sustainable Development, to be held in 2012. Twenty years after the Earth Summit, the Rio Conference will take stock of the results achieved and assess the next steps to be taken in the areas of sustainable development, green economy and global environmental governance. Thanks to its attention to environment and sustainability issues, Enel will play a key role in these initiatives.

The struggle against climate change was the focus of the 17th United Nations Climate Change Conference, held in Durban in November-December 2011. On this front, Enel set the ambitious target of becoming carbon-neutral by 2050. Jointly with 60 other electricity companies, I personally signed Eurelectric's declaration of commitment to achieving carbon neutrality. The electricity sector will thus align itself with the targets of the EU Emissions Trading Scheme and with those outlined in the long-term roadmaps that the European Commission published at the start of 2011 for a carbon-neutral energy sector and a low-carbon economy.

Enel's environmental policy has long been geared to efficient resource use, biodiversity conservation and pollution reduction. Enel has already curbed its specific CO_2 emissions by 34% from 1990, the base year of the Kyoto Protocol, and we intend to further reduce the value of this indicator by another 15% by 2020 from its levels in 2007, the year immediately preceding the first Kyoto Protocol commitment period. Moreover, we established very challenging targets, to be reached by 2020, for other fundamental parameters of environmental quality, i.e. cutting emissions and water requirements per kWh generated: particulates by 50%, SO_2 and NO_X by 10% and water by 10% from their 2010 levels.

These targets, which will consolidate the results already attained, demonstrate our continuous improvement efforts. From 2008 to 2010, in thermal generation, we already reduced water requirements and emissions of SO_2 and NO_X per kWh generated by roughly 20%, 9% and 9%, respectively. As regards particulates, the reduction obtained in 2011 vs. 2010 exceeds 25%. The commissioning of new high-efficiency thermal power plants in Italy and Spain, as well as efficiency gains in existing plants enabled us to decrease our consumption of fuel per kWh generated by 4% in the past five years.

Our commitment to the environment has solid roots: it grows in continuity with the projects and actions implemented in previous years, constantly relying on innovation of processes and technologies. In the pursuit of our targets, we are engaged on multiple fronts, as witnessed by our technological innovation plan: from carbon capture & storage to systems increasing efficiency and holding down emissions in thermal power plants; from power generation via advanced renewable-energy technologies to design and roll-out of smart grids and implementation of electric mobility projects.

With regard to renewables, our generating mix already has a net maximum capacity of about 35,000 MW (more than 35% of our overall generating capacity). In 2011, the emissions of CO_2 displaced by this mix were equivalent to those from about 55 million cars. The role of renewables will continue to rise in our generating mix: in the next five years, we plan to invest over € 6 billion in 4,500 MW of additional capacity.

We are continuously improving our environmental performance, also by extending the coverage of ISO 14001-certified Environmental Management Systems (now exceeding 90% of our generating capacity and grids) to all of our operations. Furthermore, on a yearly basis, we assess and map environmental risks in an increasingly growing number of power generation and distribution sites all over the world, with a view to covering all of them by 2014.

Our efforts to achieve higher and higher environmental standards are aimed at responding to the expectations of all of our stakeholders, beginning with our shareholders, towards whom we have the duty of creating value and mitigating risks. We are cooperating with local entities engaged in ecosystem conservation in order to monitor the areas where we operate, maximizing transparency about their conservation status. In all the countries where we are present, we are constantly in contact with Governments, institutions and sector-specific associations, national or international. In Italy, in 2011, we gave our contribution to Confindustria in the drafting of the Charter of Environmental Sustainability Principles - with which we had long been aligned.

Doing more and better with less is the motto that has always guided us, day by day, in our relentless and across-the-board efforts to innovate and achieve increasingly ambitious results.

The Chief Executive Officer
and General Manager
Fulvio Conti

Parameters of the Environmental Report

Methodological note

Contents of and principles for drafting the Report

This Report deals with the environmental implications of the activities that Enel carries out in the world through all the companies included in its scope of consolidation: electricity generation, distribution and sale, fuel storage & handling, mining and real-estate & service management.
After a concise presentation of the Enel Group, the Report describes the environmental governance tools: environmental policy and targets, organization, management systems, reporting, relations with external stakeholders and environmental commitment (financial resources, climate strategy, renewables, energy efficiency, nuclear energy, fuel exploration and extraction, research & innovation, water resource management, biodiversity conservation, environmental risk assessment and management, as well as awareness, training & education). Then, the Report reviews the key energy & environment performance trends in the 2007-2011 period for the overall Group and for each country and technology.
At country level, the Report gives insight into the significant events occurred in 2011, with the corresponding GRI indicators.
Qualitative and quantitative environmental performance data are reported in accordance with the "Sustainability Reporting Guidelines" (2011) and the "Electric Utilities Sector Supplement" (2001), issued by the Global Reporting Initiative (GRI). The following GRI Content Index table enables the reader to identify the individual GRI key performance indicators in the text. However, the Report has a deeper level of detail than required by the GRI, since it is the result of a reporting process that Enel has carried out progressively in sixteen editions, including the present one.
Moreover, Enel voluntarily requested Ernst & Young SpA to conduct a "limited assurance review" of its Environmental Report. The Report presents the Enel Group's environmental performance vs. targets. In particular, the preparation of the Report involved the identification of the relevant stakeholders and of the significant aspects to be reported and relied on the use and update of appropriate processes of internal management and control of the reported data.

Data consolidation

The data included in the Report refer to Enel SpA and to the companies included in its scope of consolidation in financial years 2007 to 2011 (for details, the reader is referred to http://www.enel.com/it-IT/investor/financial_reports/annual/ and to http://www.enel.com/en-GB/investor/financial_reports/annual/).

In particular, the data of the fully and proportionally consolidated companies (if they produce significant environmental impacts with reference to the specific indicator being commented on) are reported proportionally to their percentage of consolidation. Possible limitations of the reporting perimeter (due to poor-quality or inefficient data collection) are explicitly indicated and commented on.

Affiliates (assessed under the net-worth criterion in the Consolidated Financial Statements) and other entities on which Enel exerts significant influence (including joint ventures) are included in the computation of the data (where available) proportionally to Enel's holdings therein. If the same affiliates or entities produce significant impacts, they are also included in the qualitative reporting sections.

The status data (number of installations, net maximum capacity, length of grids, etc.) reflect the situation of the companies as of December 31 of 2011 or of each of the reported years. The flow data (resources, electricity and heat generation, emissions, liquid releases, waste, etc.) are only considered to the extent of the companies' period of relevance to the Group.

Any update/correction of data already published in previous editions will be appropriately identified and explained in the text.

Criteria for the presentation of numerical values

For the numerical values shown in the tables – excluding those which can be expressed only as integers (e.g. number of installations, number of personnel members) – the following approximation criterion has been followed: no decimals for values greater than or equal to 100; one decimal for values lower than 100 and greater than or equal to 10; two decimals for values lower than 10 and greater than or equal to 1; and three decimals for values lower than 1. This criterion matches the one adopted in data collection. However, if the last decimal digit is zero, it is omitted.

Some of the data are calculated by considering the decimal digits that are not visible in the tables; this may produce minor discrepancies between the result shown and the one which would derive only from the visible part of the data.

Technical definitions

As regards electricity, the technical definitions of an energy nature are based on the "Statistical Terminology Employed in the Electricity Supply Industry", published by UNIPEDE (International Union of Producers and Distributors of Electrical Energy), which merged with Eurelectric in June 2001.

Formats

The formats for reporting both process and governance data are continuously updated taking into account changes in Enel's organizational configuration, developments in legislation and technologies, as well as experience feedbacks.

GRI Content Index (1)

	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EN8	EN9	EN10	EN11	EN12	EU13	EN13
OVERALL GROUP	83, 84, 85, 86, 87, 88, 89, 91, 92, 93, 94	-	83, 84, 85, 87, 88, 89, 93, 94, 95	85, 90, 93, 95, 97, 99	51	50, 51, 101	51	85, 90, 93, 95	65	85, 91, 93, 95	65	64	66, 67, 72, 73	66, 67, 68, 69, 70, 71, 72, 73
EUROPE														
BULGARIA	129, 131	-	129, 131	130, 129	-	-	-	129, 131	-	129, 131	-	-	-	-
FRANCE	134	-	134	134	135	135	-	-	-	-	-	-	-	-
GREECE	137	-	-	137	139	139	-	-	-	-	-	-	-	-
IRELAND	141, 142	-	141, 142	-	-	-	-	141, 142	-	-	-	-	-	-
ITALY	150, 151, 157, 158, 161	-	150, 157, 158, 161	150, 152, 157	161	158, 161, 162	167	151, 157, 158, 162	-	151, 158, 162	-	-	-	-
PORTUGAL	169, 170, 172, 174	-	169, 172, 174	-	174	174	-	170, 172, 174	-	174	-	-	-	-
ROMANIA	177	-	177	178, 179	181	178, 180, 181	-	-	-	-	-	-	-	-
RUSSIA	184, 185, 187, 189	-	184, 187, 189	184	189	185, 188, 189	-	184, 185, 187, 189	-	184, 187, 189	-	-	-	-
SLOVAKIA	196, 197, 201, 203	203	196, 197, 201	197	-	-	-	197, 201	-	197, 201	-	-	-	-
SPAIN	213, 214, 221, 224	-	213, 221, 224	214, 215, 221	224	224	-	214, 221	-	214, 221	-	-	-	-
NORTH AMERICA														
CANADA	231, 234	-	231, 234	-	-	-	-	231, 234	-	-	-	-	-	-
USA	238, 240	-	238, 240	-	241	241	-	238, 240	-	-	-	-	-	-
LATIN AMERICA														
ARGENTINA	248, 249, 251, 252, 253	-	248, 251, 252, 253	249, 251	-	-	-	249, 251, 253	-	-	-	-	-	-
BRAZIL	257, 258, 260, 261	-	257, 260, 261	257, 258, 260	261	261	-	257, 258, 260, 261	-	-	-	-	-	-
CHILE	268, 269, 272, 273, 274	-	268, 272, 273, 274	269, 270, 272	274	274	-	269, 272, 274	-	269, 272	-	-	-	-
COLOMBIA	280, 281, 284, 285	-	280, 284, 285	280, 281, 284	285	-	-	281, 284, 285	-	-	-	-	-	-
COSTA RICA	288	-	288	288	290	290	-	-	-	-	-	-	-	-
GUATEMALA	292	-	292	292	-	-	-	-	-	-	-	-	-	-
MEXICO	296	-	296	-	-	-	-	-	-	-	-	-	-	-
PANAMA	300	-	300	-	-	-	-	-	-	-	-	-	-	-
PERU	306, 307, 309, 310	-	306, 309, 310	307, 309	310	-	-	307, 309, 310	-	-	-	-	-	-
AFRICA														
MOROCCO	316, 318, 319	-	316, 318, 319	-	319	-	-	316, 318, 319	-	-	-	-	-	-

EN Legend

MATERIALS

EN1 Materials used by weight or volume. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN2 Percentage of materials used that are recycled input materials.

ENERGY

EN3 Direct energy consumption by primary energy source.

EN4 Indirect energy consumption by primary source.

EN5 Energy saved due to conservation and efficiency improvements.

EN6 Initiatives to provide energy-efficient or renewable-energy-based products and services, and reductions in energy requirements as a result of these initiatives.

EN7 Initiatives to reduce indirect energy consumption and reductions achieved.

WATER

EN8 Total water withdrawal by source. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN9 Water sources significantly affected by withdrawal of water.

EN10 Percentage and total volume of water recycled and reused.

BIODIVERSITY

EN11 Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.

EN12 Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EU13 Biodiversity of offset habitats compared to the biodiversity of the affected areas.

EN13 Habitats protected or restored.

EN14 Strategies, current actions, and future plans for managing impacts on biodiversity. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN15 Number of IUCN (International Union for Conservation of Nature and Natural Resources) Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.

EMISSIONS, EFFLUENTS, AND WASTE

EN16 Total direct and indirect greenhouse gas emissions by weight. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN17 Other relevant indirect greenhouse gas emissions by weight.

EN14	EN15	EN16	EN17	EN18	EN19	EN20	EN21	EN22	EN23	EN24	EN25	EN26	EN27	EN28	EN29	EN30
64, 67, 68, 69, 70, 71, 73	66	82, 102, 103, 104, 105, 106, 108, 110	82, 104	47, 103, 106	-	102, 103, 104, 106, 107, 108, 110	111, 112, 113, 114	115, 116, 117, 118, 121, 122, 123	-	124	65	45, 46, 63	-	41, 42	80, 81, 82	44
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-	-	135	-	135, 138	-	-	-	135, 138	-	-	-	135	-	-	134	-
-	-	-	-	139	-	-	-	-	-	-	-	139	-	-	137	-
-	-	142, 143	-	-	-	142, 143	141, 142	142, 143	143	-	-	143	-	-	-	-
-	-	154, 159, 162	-	154, 161, 162	163	154, 159	151, 154, 155	155, 156, 157, 159, 160, 162	163	-	164	-	-	-	149, 157	-
-	-	171, 173, 174	-	171, 174	-	171, 173, 174	171	171, 172, 173, 174	-	-	-	174	-	-	-	-
-	-	179, 180	-	179, 181	-	-	-	179, 180, 181	-	-	-	181	-	-	177, 179	-
-	-	186, 188, 189	-	-	-	186, 188, 189	185, 186	187, 188, 189	-	-	-	189	-	-	184	-
-	-	198, 199, 201, 203	-	199, 203	203	198, 199, 201, 202, 203	197, 199, 200, 202	200, 202, 203	203	-	-	204	-	-	196	-
-	-	216, 222, 224	-	216, 224	-	216, 222, 224	214, 217, 218, 222, 223	218, 219, 220, 223, 224	224	-	-	225	-	-	212, 221, 225	-
-	-	232, 234	-	232, 235	-	232, 234, 235	232, 233	233, 235	-	-	-	-	-	-	-	-
-	-	239, 240	-	239, 241	-	-	-	239, 240, 241	-	-	-	241	-	-	-	-
-	-	250, 252, 253	-	250, 253	253	250, 252, 253	249, 250	250, 251, 252, 253	-	-	-	253	-	-	248, 251	-
-	-	259, 260, 261	-	259, 261	261	259, 260, 261	258, 259	259, 261	-	-	-	262	-	-	257, 260	-
-	-	270, 273, 274	-	270, 274	275	270, 273, 274	269, 270, 271	271, 272, 273, 274	275	-	-	275	-	-	268, 272	-
-	-	282, 284, 285	-	282, 286	-	282, 284, 286	281, 282, 285	282, 283, 286	-	-	-	286	-	-	280, 283	-
-	-	289	-	289, 290	-	-	-	289, 290	-	-	-		-	-	288	-
-	-	293	-	293, 294	294	-	-	293, 294	-	-	-	294	-	-	292	-
-	-	297	-	297, 298	298	-	-	297, 298	-	-	-	298	-	-	296	-
-	-	300	-	300, 301	-	-	-	300, 301	-	-	-		-	-	300	-
-	-	308, 309, 310	-	308, 310	310	308, 309, 310	307, 308	308, 309	310	-	-	311	-	-	306, 308	-
-	-	317, 318	-	-	-	317, 318	317	317, 318, 319	-	-	-	319	-	-	-	-

EN18 Initiatives to reduce greenhouse gas emissions and reductions achieved. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN19 Emissions of ozone-depleting substances by weight.

EN20 NO_X, SO_X, and other significant air emissions by type and weight. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN21 Total water discharge by quality and destination. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN22 Total weight of waste by type and disposal method. This indicator includes the sector-specific commentary required by the EUSS (Electric Utilities Sector Supplement).

EN23 Total number and volume of significant spills.

EN24 Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.

EN25 Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.

PRODUCTS AND SERVICES

EN26 Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.

EN27 Percentage of products sold and their packaging materials that are reclaimed by category.

COMPLIANCE

EN28 Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.

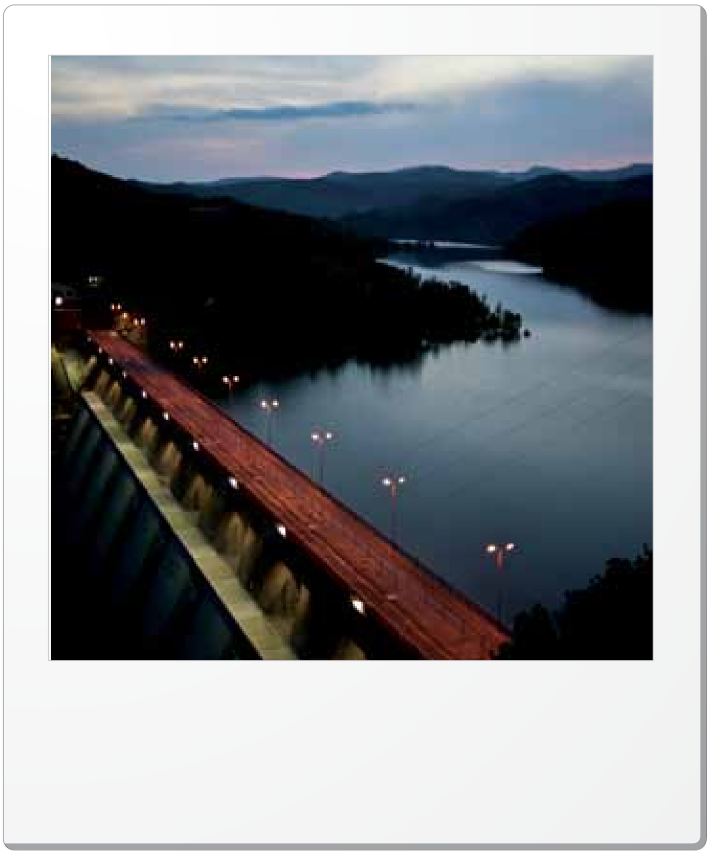
TRANSPORT

EN29 Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.

OVERALL

EN30 Total environmental protection expenditures and investments by type.

(1) For each indicator, the table shows the commentary page numbers.



Independent Auditors' Report on the Limited Assurance Engagement on the Environmental Report

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Independent auditors' report on the limited assurance engagement of the Environmental Report 2011 of Enel Group as of December 31, 2011 (Translation from the original Italian text)

To the Board of Directors of
Enel S.p.A.

1. We have carried out the limited assurance engagement of the Environmental Report of Enel S.p.A. and its subsidiaries ("Enel Group") as of December 31, 2011 exclusively in relation to the indicators summarized in the *"GRI Content Index"* section. The directors of Enel S.p.A. are responsible for the preparation of the Environmental Report in accordance with the qualitative and quantitative environmental performance disclosures required by the *"Sustainability Reporting Guidelines"*, version 3.1, issued in 2011 by *Global Reporting Initiative* ("G.R.I.") and with the sector supplement *"Sustainability Reporting Guidelines & Electric Utilities Sector Supplement"* issued in 2009 by G.R.I., as stated in the section *"Methodological note"*, as well as for determining the Group's commitments regarding the environmental performance and the reporting of results achieved. The directors of Enel S.p.A. are also responsible for the identification of stakeholders and of significant matters to report, as well as implementing and maintaining appropriate processes to manage and control internally data and disclosures indicated in the Environmental Report. Our responsibility is to issue this report on the basis of the work performed.

2. Our work has been conducted in accordance with the principles and guidelines established, for a limited assurance engagement, by the *"International Standard on Assurance Engagements 3000 - Assurance Engagements other than Audits or Reviews of Historical Financial Information"* (*"ISAE 3000"*), issued by the *International Auditing and Assurance Standards Board*. This standard requires the compliance with applicable ethical principles (*"Code of Ethics for Professional Accountants"* issued by *the International Federation of Accountants - I.F.A.C.*), including professional independence, as well as planning and executing our work in order to obtain a limited assurance, rather than a reasonable assurance, that the Environmental Report is free from material misstatements. A limited assurance engagement of the Environmental Report consists in making inquires, primarily with company's personnel responsible for the preparation of information included in the Environmental Report, in the analysis of the Environmental Report and in other procedures in order to obtain evidences considered appropriate. The procedures performed are summarized below:

   a. analysis of the processes that support the generation, recording and management of the quantitative data reported in the Environmental Report. In particular, we have carried out the following procedures:

      - interviews and discussions with Enel S.p.A.'s management and personnel from Enel OGK-5 OJSC, Slovenské Elektrárne AS, Enel Energie SA, Enel Energie Muntenia SA, Endesa SA, to obtain an understanding about the information, accounting and reporting system in use for the preparation of the Environmental Report as well as the internal control processes and procedures supporting the collection, aggregation, processing and transmission of data and information to the department responsible for the preparation of the Environmental Report;

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- on-site verifications at Mochovce nuclear plant (Slovakia), Presenzano hydroelectric plant (Italy), Besós combined heat and power gas plant (Spain) and Lleida hydroelectric plant (Spain);
- analysis, on a sample basis, of the documentation supporting the preparation of the Environmental Report in order to confirm the processes in use, their adequacy and the operation of the internal control system for the correct reliability of data and information in relation to the objectives described in the Environmental Report.

b. compliance analysis of qualitative information included in the Environmental Report with the guidelines identified in paragraph 1 of the present report and of their internal consistency, with reference to the strategy and to the environmental policies.

c. obtaining the representation letter, signed by the legal representative of Enel S.p.A., relating to the compliance of the Environmental Report with the guidelines indicated in paragraph 1, as well as to the reliability and completeness of information and data presented in the Environmental Report.

A limited assurance engagement is substantially less in scope than a reasonable assurance engagement performed in accordance with *ISAE 3000* and, as a consequence, we may not have become aware of all the significant events and circumstances which could be identified by performing a reasonable assurance engagement.

The Environmental Report presents, for comparative purposes, data related to prior years. Some data have been restated compared to the data previously reported and assured by another independent auditor, whose report was issued on April 20, 2011. The restatement principles of comparative data and the related disclosure have undergone limited assurance procedures for the only purpose of issuing this report.

3. Based on the procedures carried out, nothing has come to our attention that causes us to believe that the Environmental Report of the Enel Group as of December 31, 2011, exclusively in relation to the indicators summarized in the *"GRI Content Index"* section, is not in compliance, in all material respects, with the qualitative and quantitative environmental performance disclosures required by the *"Sustainability Reporting Guidelines"*, version 3.1, issued in 2011 by G.R.I., and with the sector supplement *"Sustainability Reporting Guidelines & Electric Utilities Sector Supplement"* issued in 2009 by G.R.I., as stated in the section *"Methodological note"*.

Rome, April 24, 2012

Reconta Ernst & Young S.p.A.

Signed by: Massimo delli Paoli, Partner

This report has been translated into the English language solely for the convenience of international readers

Profile of the Enel Group

Enel is the largest power company in Italy and one of the main utilities listed in Europe. It is an integrated operator, active in the electricity and gas sectors.
The Group is present in 40 countries, with a net installed capacity of about 97,000 MW, and sells electricity and gas to about 61 million customers.

Business

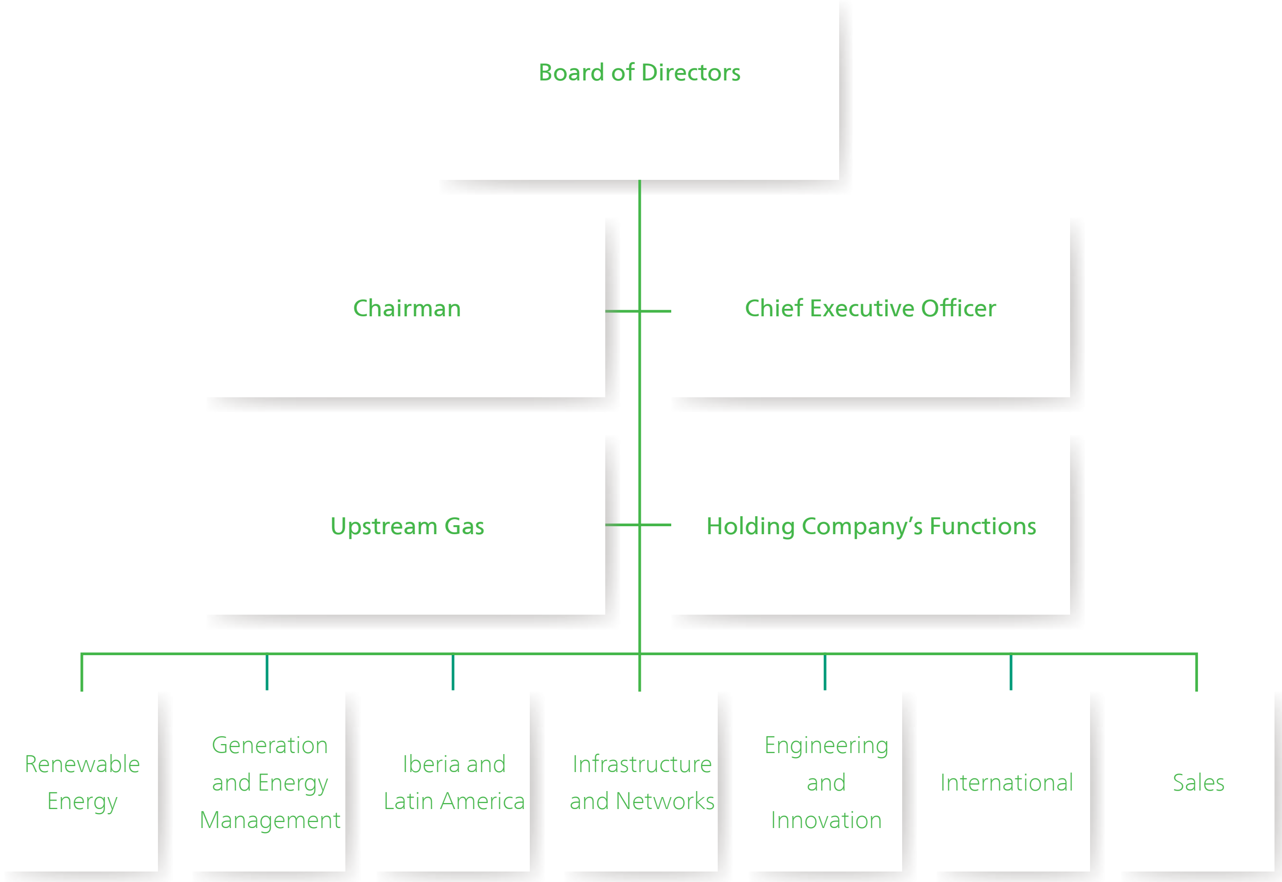
In 2011, Enel posted revenues exceeding € 79.5 billion, a gross operating margin of € 17.7 billion and a net income of about € 4.1 billion. The Group's workforce at December 31, 2011, was equal to over 75,000. Enel's generating mix is extremely diversified by source and technology: hydro, thermal, nuclear, geothermal, wind, solar (photovoltaic) and other renewables. About 42% of its electricity is CO_2-free.

Enel is engaged in the development of electricity generation from renewables, as well as in research into and development of new eco-friendly technologies. Enel Green Power, listed on the stock exchange, is the company of the Group dedicated to developing and managing electricity generation from renewables. It manages more than 7,000 MW of installed capacity (hydro, wind, geothermal, photovoltaic, biomass-fired and CHP plants) in Europe and the Americas.

Enel was the first in the world to replace traditional electromechanical meters with smart meters, permitting real-time meter reading and remote customer relationship management, at the premises of all of its Italian customers (32 million). Smart meters, which attracted the interest of many utilities all over the world, are core elements for the deployment of smart grids. In Spain, Endesa is installing 13 million smart meters at its customer premises. The project will be completed by 2015.

Shareholders

Enel, which has been listed on the Milan Stock Exchange since 1999, is the Italian company with the highest number of shareholders: about 1.4 million including retail and institutional ones. Enel's main shareholder is the Ministry of Economy and Finance (31.24% holding). Thanks to its Code of Ethics, Sustainability Report, environmental protection policy and adoption of international best practices of transparency and corporate governance, Enel's shareholders include leading international investment funds, insurance companies, pension funds and ethical funds.



Global presence

After completing its international expansion stage, Enel is now engaged in consolidating its assets and further integrating its business.
The Enel Group is present in 40 countries of 4 continents. In **Spain**, Enel owns 92.06% of Endesa, the leading power company of the country and the no. 1 private electric utility of Latin America. Additionally, Enel Green Power manages renewable-energy plants in Spain and Portugal.
Enel, through Enel Green Power, is one of the main independent renewable-energy operators of the **American continent**, with Enel Green Power North America and Enel Green Power Latin America, two companies having an installed capacity of roughly 1,700 MW.
In **North America**, Enel Green Power North America has more than 1,000 MW of hydro, geothermal, wind and biomass-fired plants.
In **Latin America**, Enel Green Power Latin America manages 669 MW of wind farms and hydro plants.
Through Endesa, the Enel Group is a top-ranking operator in Latin America with around 16 GW of capacity installed in thermal plants, hydro and other renewable-energy plants: 4.4 GW in Argentina, 1 GW in Brazil, 5.6 GW in Chile, 2.9 GW in Colombia and 1.8 GW in Peru.

In **France**, Enel is now present in the nuclear sector with a 12.5% stake in the new-generation European Pressurized Reactor (EPR) project. In the same country, Enel is also present in the renewable-energy sector through Enel Green Power, with 166 MW of wind farms already in service. In the power trading sector, Enel owns about 5% of Powernext, the French power exchange. In 2011, Enel sold 11.4 TWh to large customers in France.

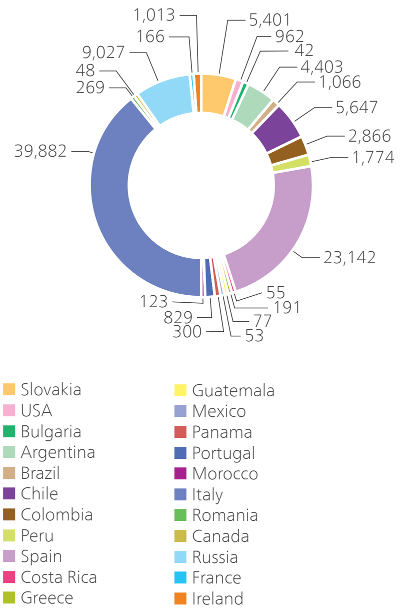
In **Slovakia**, Enel holds 66% of Slovenské elektrárne (SE), the first electricity producer in Slovakia and the second in Central-Eastern Europe, with a generating capacity of 5,401 MW, well balanced between nuclear, thermal and hydro.

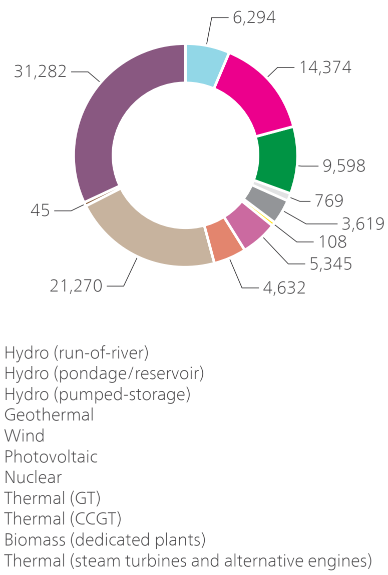
In **Romania**, Enel sells electricity through Enel Energie and Enel Energie Muntenia and distributes electricity through Enel Distributie Banat, Enel Distributie Dobrogea and Enel Distributie Muntenia. The Group has 2.6 million customers in the country. Moreover, always in Romania, Enel Green Power operates in the renewable-energy sector, with 269 MW of wind plants.

In **Russia**, Enel is a vertically-integrated operator in the upstream gas sector and in electricity generation and sale. In the upstream gas sector, through SeverEnergia (a consortium in which Enel holds a 19.6% stake), Enel manages some natural gas assets. Furthermore, Enel owns 56.43% of Enel OGK-5 Genco (formerly OGK-5), which has four thermal plants (9,027 MW) located in the highest growth areas of the country. In the power sale sector, Enel owns 49.5% of RusEnergoSbyt (Russia's most important electricity trader), whose customers include the major companies of the country.

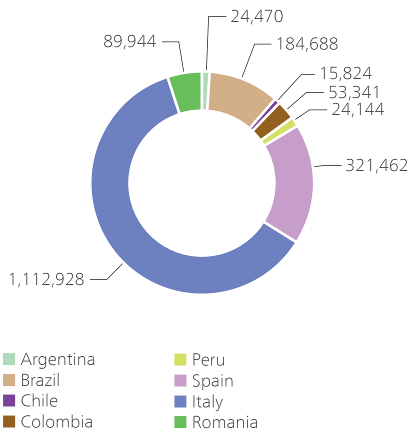
(Unless otherwise indicated, the data of this profile were updated on December 31, 2011).

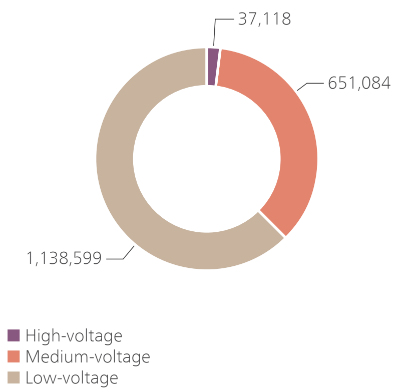
Generating mix as of Dec. 31, 2011
Total: 97,336 MW

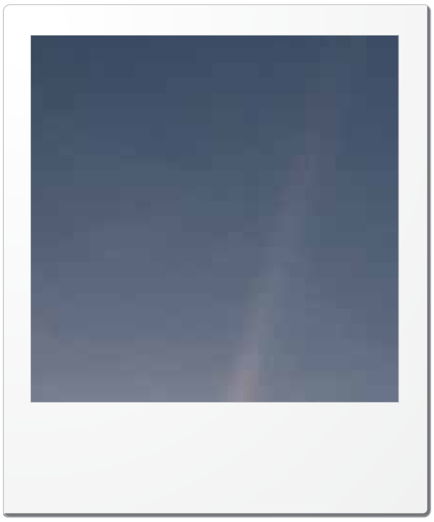
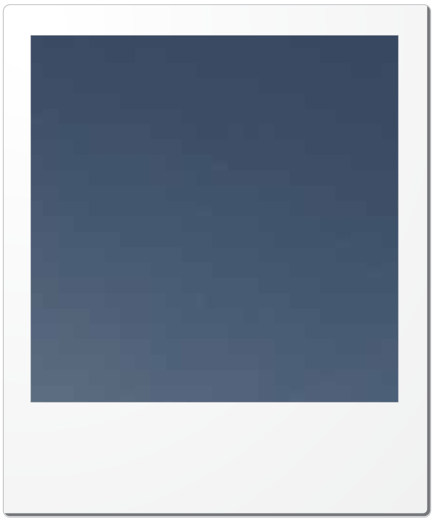
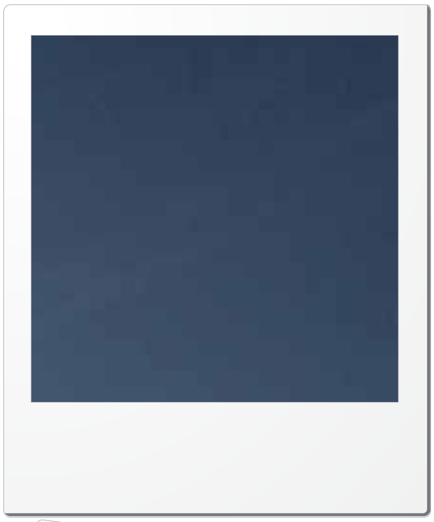
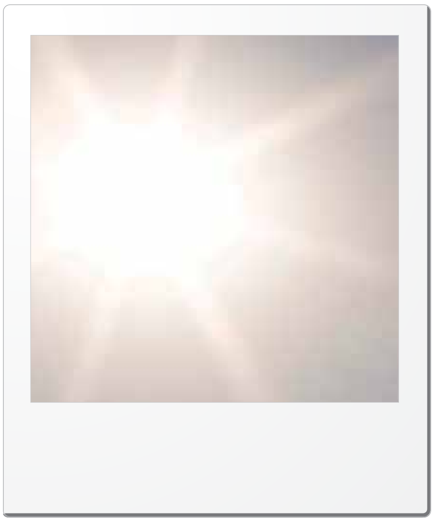
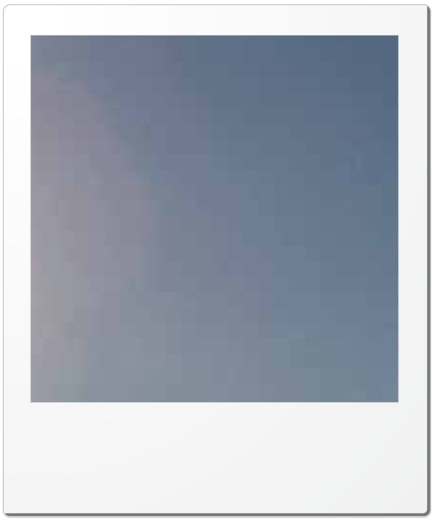


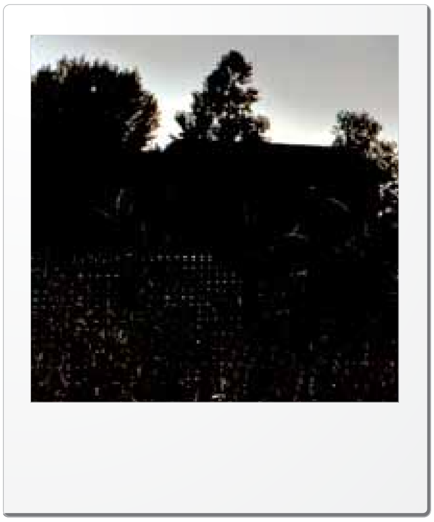
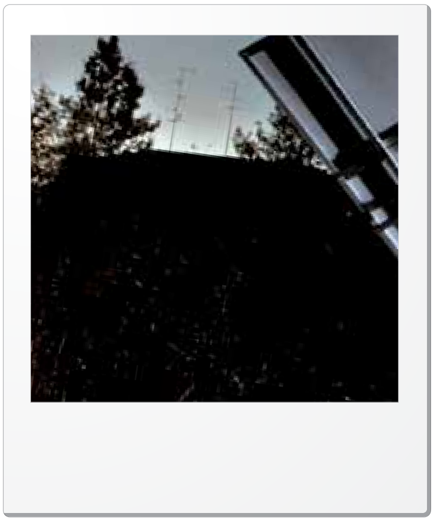
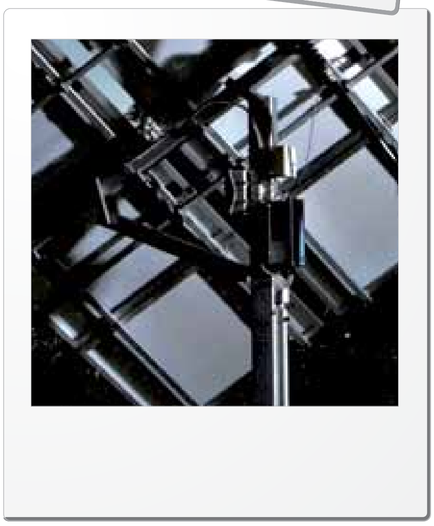


Electricity distribution grid as of Dec. 31, 2011
Total: 1,826,801 km

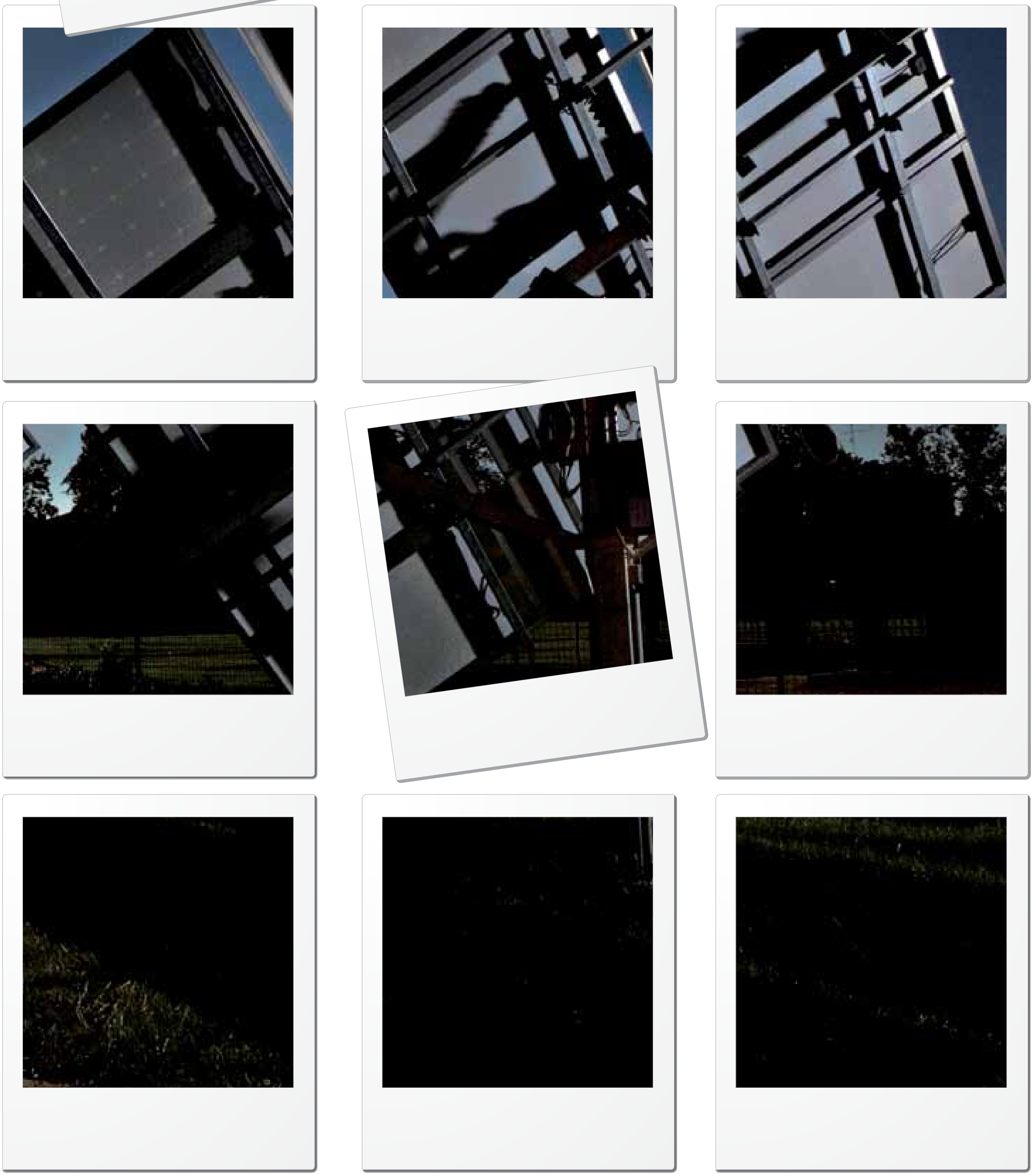





Environmental governance



Environmental policy and targets

Enel regards the environment, the fight against climate change and sustainable development as strategic factors in carrying out and expanding its operations and as key drivers for consolidating its leadership in energy markets. The Group's environmental policy is based on three fundamental principles and pursues ten strategic targets.

Principles

> Safeguarding the environment.
> Improving and promoting the environmental features of products and services.
> Creating corporate value.

Strategic targets

> Application of internationally-recognized environmental management systems to the entire organization.
> Optimized integration of installations and buildings into the landscape, while conserving biodiversity.
> Mitigation of environmental impacts by applying the best available technologies and the best practices in construction, operation and decommissioning of installations.
> Leadership in renewables and low-emission electricity generation.
> Efficient use of energy, water and raw materials.
> Optimized management of waste and liquid releases.
> Development of innovative technologies for the environment.
> Communication of Enel's environmental management efforts to citizens, institutions and other stakeholders.
> Environmental awareness, training & education of employees.
> Promotion of environmentally-sustainable practices among suppliers and contractors.

The Chief Executive Officer
and General Manager
Fulvio Conti

Strategic targets

Enel translates the principles enshrined in its environmental policy into a number of initiatives, which are aimed at achieving its strategic targets.

Application of internationally-recognized environmental management systems to the entire organization

> Extension of certification to sites that are not yet certified

> Yearly maintenance of already acquired ISO 14001 certifications and EMAS registrations

Optimized integration of installations and buildings into the landscape, while conserving biodiversity

> Biodiversity conservation projects (conservation of protected species habitats, reintroduction of particular species, research centers and sighting points, replanting of indigenous flora)

> Biomonitoring (land-, sea- and river-based)

> Use of overhead or underground cables (in lieu of bare conductors) in power distribution lines

> Mitigation of the visual impact of production and distribution installations and of mines

Mitigation of environmental impacts by applying the best available technologies and the best practices in construction, operation and decommissioning of installations

> Assessment of the environmental impact of construction or major retrofits of installations

> Study and sustainable use of the Best Available Techniques (BATs)

> Protection, monitoring and remediation of surface water, soil and subsoil in the areas surrounding installations

Leadership in renewables and low-emission electricity generation

> Enlargement of the renewable-energy portfolio by building new plants, acquiring holdings and developing partnerships

> Development of new generating capacity and of the nuclear technology

> Construction of new combined-cycle plants

Efficient use of energy, water and raw materials

> Improvement of plant efficiency (use of more efficient components and/or processes, reduction of consumption by auxiliaries)

> Reduction of grid losses in electricity distribution (optimized grid design, use of conductors with larger cross-section and of electrical components with less losses)

> Mapping and monitoring of all production sites to identify potential water stress and, where necessary, make a more efficient use of the water resource

> Internal recycling of water for industrial uses

> Reuse of ash and gypsum from coal and brown coal as raw materials in external production processes

> Promotion of end-use energy efficiency (distribution of more energy-efficient products for lighting and space heating, use of more energy-efficient lamps in public lighting)

> Deployment of systems (e.g. smart meters) and rate plans which may build awareness of and encourage efficient electricity usage

Optimized management of waste and liquid releases

> Reduction of waste production

> Decrease of the polluting load of liquid releases

> Increased recovery of waste and liquid releases (also by better sorting)

> Qualification of waste disposal operators

> Use of information systems for waste traceability

Development of innovative technologies for the environment

> Research on and construction of pilot facilities for:
- carbon capture & storage (CCS)
- systems to increase efficiency and hold down emissions
- smart grids
- solar thermodynamic power generation
- innovative renewable-energy installations (solar photovoltaic, geothermal, wind and sea energy)
- multi-generation systems
- electric mobility

Communication of Enel's environmental management efforts to citizens, institutions and other stakeholders

> Publication of the Environmental Report, of the Sustainability Report and of the sustainability section of the Annual Report

> Preparation of Environmental Declarations for EMAS-registered sites

> Communication with analysts and participation in various sustainability indexes

> Opening of installations to the public

> Posting of environmental initiatives on the Internet site

Environmental awareness, training & education of employees

> Periodical courses on environmental themes

> Posting of thematic insights on the Intranet site

Promotion of environmentally-sustainable practices among suppliers and contractors

> Use of suppliers' qualification criteria based on environmental performance

> Monitoring of contractors' performance during and at the end of works or upon acceptance tests

> Seminars of training on/awareness of significant environmental aspects upon commencement of works (communication of Enel's environmental policy, explanation of procedures to manage impacts due to activities, e.g. waste, emissions, liquid releases, etc.)

Quantitative targets

With respect to 2010 data, Enel set the following targets – to be reached by 2020 – for some of the most significant aspects of its activities:

> total specific emissions of SO_2: down by 10%

> total specific emissions of NO_X: down by 10%

> total specific emissions of particulates: down by 50%

> total specific requirements of water for industrial uses: down by 10%.

Furthermore, Enel confirmed its target of lowering total specific emissions of CO_2 by 7% from their 2007 levels by 2012 and set an additional target of reducing them by 15% from the same levels by 2020. These targets are in line with its current initiatives and programs, which include the installation of emission abatement systems in thermal plants, the construction of new combined-cycle plants and the development of new generating capacity from renewable and nuclear sources.

Environmental organization

Environmental governance is implemented by operational units and coordinated by a dedicated unit at headquarters' level with the mission of:

1. formulating environmental policies and strategic environmental targets
2. monitoring the management of risks and the achievement of targets
3. issuing guidelines for Environmental Management Systems, managing the Group's reporting activity and preparing the Environmental Report
4. fostering the adoption of best practices

Divisions and Enel Servizi

Depending on the specific issues to be covered, individuals and teams in charge of conducting environmental activities are present at different levels inside the Divisions and Enel Servizi.

> Staff functions coordinate the management of the respective environmental issues, providing the necessary specialist support in line with the Holding Company's guidelines.

> Operational units deal with the specific aspects of industrial sites.

Human resources dedicated to the environment

In the overall Group, the human resources dedicated to the environment amount to 437 full-time equivalents (FTEs). This figure includes support personnel, i.e. personnel members at Holding Company, divisional and regional levels who provide environmental services to multiple operational units.

Organizational structure (FTEs)

16	Regulatory, Environment and Carbon Strategy function
36	Renewable Energy Division
107	Generation and Energy Management Division
110	Iberia and Latin America Division
75	Infrastructure and Networks Division
14	Engineering and Innovation Division
65	International Division
10	Sales Division
4	Enel Servizi
437	Total

Environmental management systems

Targets

The progressive deployment of internationally-recognized environmental management systems (EMSs) in all the activities of the Group (industrial, planning, coordination, services, etc.) represents a strategic target of Enel's environmental policy.

Organization of environmental management systems

Enel SpA ensures the environmental governance of the Group by coordinating certification activities, issuing guidelines for compliance with the applicable requirements and enforcing its environmental policy in an effective and homogeneous way.

2011 Results

EN6 EN7 In 2011, the ISO 14001 certification was awarded to:

> the Engineering and Innovation Division, Italy;
> Enel Energie, Enel Energie Muntenia and Enel Servicii Comune, Romania; the first two companies are involved in energy sales, while the third one provides general services (management of real estate, vehicle fleet, etc.);
> all the industrial operations in Russia and Greece;
> the thermal plant of Ca's Tresorer and the mining sites of Andorra and Puertollano, Spain.

The following are the ISO 14001-certified or EMAS-registered activities.

ISO 14001-certified and EMAS-registered activities

ISO 14001

Electricity generation

88,622
net maximum capacity certified (MW)

91%
coverage

Electricity distribution

1,701,400
grids certified (km)

93%
coverage

EMAS

Electricity generation

28,737
net maximum capacity certified (MW)

40.5%
coverage (EU)

Europe

Greece	EMAS-registered installations/sites	ISO 14001-certified installations/sites	MW
Hydro power plants		Glafkos and Perivoli II, both certified in 2011	**10**
Wind power plants		Agios Kyrilos, Aspiri Petra, Geraki, Heliolousti I, Heliolousti II, Koutsoutis, Lithos, Monastiri I, Monastiri II, Soros, Voskero, all certified in 2011	**122**

Ireland	EMAS-registered installations/sites	ISO 14001-certified installations/sites	MW
Thermal power plants		All	**1,013**

Italy	EMAS-registered installations/sites	MW	ISO 14001-certified installations/sites	MW	km
Thermal power plants	Bastardo, Fusina, Genova, La Casella, La Spezia, Leri Cavour, Montalto di Castro, Pietrafitta (547.5 MW, registered in 2011), Porto Corsini, Porto Marghera, Priolo Gargallo, Santa Barbara, Sulcis, Torrevaldaliga Nord	**13,356**	Bastardo, Brindisi Sud, Fusina, Genova, La Casella, La Spezia, Leri Cavour, Montalto di Castro, Pietrafitta, Porto Corsini, Porto Marghera, Porto Tolle, Priolo Gargallo, Rossano Calabro, Santa Barbara, Sulcis, Termini Imerese, Torrevaldaliga Nord	**20,835**	
Hydro power plants	Business Units: Bologna, Cuneo, Montorio, Sardegna, Vittorio Veneto	**6,344**	Business Units: Bologna, Cuneo, Montorio, Sardegna, Sicilia, Sondrio, Vittorio Veneto	**10,868**	
	Bolzano (= SE Hydropower)	**617**	Bolzano (= SE Hydropower)	**617**	
			Enel Green Power Business Units: Bergamo, Domodossola, Napoli	**1,511**	
	Business Unit: Trento (Hydro Dolomiti Energia)	**624**	Business Unit: Trento (Hydro Dolomiti Energia)	**624**	
Wind power plants			Enel Green Power Business Unit: Napoli	**623**	
Geothermal power plants	All	**722**	All	**722**	
Power grid			All		**1,112,927**
Real estate, vehicle fleet and services (Procurement, ICT, Enel University)			All (Procurement, ICT, Enel University)		
Sales			All		
Engineering and Innovation			All, certified in 2011		

Portugal	EMAS-registered installations/sites	MW	ISO 14001-certified installations/sites	MW	
Thermal power plants	Pego	**221**	Endesa	**221**	

Romania	EMAS-registered installations/sites		ISO 14001-certified installations/sites		km
Power grid			All		**89,944**
Sales			All; Enel Energie and Enel Energie Muntenia certified in 2011		
Real estate, vehicle fleet and services			All, certified in 2011		

Russia	EMAS-registered installations/sites		ISO 14001-certified installations/sites	MW	
Thermal power plants	na		All	**9,027**	

Slovakia	EMAS-registered installations/sites		ISO 14001-certified installations/sites	MW	
Thermal power plants			All	**1,245**	
Nuclear power plants			All	**1,818**	
Hydro power plants			All	**2,329**	

Spain	EMAS-registered installations/sites	MW	ISO 14001-certified installations/sites	MW	km
Thermal power plants	Endesa: Barranco de Tirajana, Cristóbal Colón, Granadilla, Litoral, Puentes (steam-condensing), Puentes (combined-cycle), Teruel, San Roque, Ceuta, Melilla; San Roque (402 MW), Ceuta (93 MW) and Melilla (77 MW) registered in 2011	**6,853**	Endesa: Alcudia, Barranco de Tirajana, Besos, Candelaria, Ca's Tresorer (429 MW, certified in 2011), Ceuta, Compostilla, Cristóbal Colón, El Palmar, Granadilla, Ibiza, Jinámar, Las Salinas, Llanos Blancos, Litoral, Los Guinchos, Mahón, Melilla, Puentes (steam-condensing), Puentes (combined-cycle), Punta Grande, San Roque, Son Reus, Teruel	**12,349**	
			Enel Green Power España: Biogas El Garraf UTE	**6**	
Nuclear power plants			All	**3,526**	
Hydro power plants			Endesa: Ebro-Pirineos, Noroeste, Sur	**4,627**	
			Enel Green Power España: Arroibar, Anllo, Avia, Los Batanes	**23**	
Wind power plants			Enel Green Power España: Aldeavieja, Belmonte, Caldereros, Careón, Castelo, Coriscada, Corzán, Do Vilán, Manzanal, Padul, Peña Forcada, Peña Armada, Peña II, Peña del Gato, Picazo, San Andrés, Couto de San Sebastián, Valdesamario, Viravento	**457**	
Power grid			Aragon, Andalusia, Extremadura, Balearic Islands, Canary Islands, Catalonia		**321,227**
Port terminals	Ferrol, Los Barrios (the latter registered in 2011)		Carboneras, Ferrol, Los Barrios		
Mining sites			Andorra, Puertollano (the latter certified in 2011)		
Real estate			Endesa's offices: Madrid Enel Green Power España's offices: Madrid EUFER's offices: Andalusia, Barcelona, Castilla, Extremadura, Galicia, Las Palmas, León, Madrid, Santander, Seville, Tenerife, Valencia		

North Africa

Morocco	ISO 14001-certified installations/sites	MW
Thermal power plant	All	**123**

Latin America

Argentina	ISO 14001-certified installations/sites	MW	km
Thermal power plants	All	**3,075**	
Hydro power plants	All	**1,328**	
Power grid	All		**24,470**

Brazil	ISO 14001-certified installations/sites	MW	km
Thermal power plants	All	**317**	
Hydro power plants	Cachoeira Dourada	**656**	
Power grid	Ampla and Coelce		**59,523**

Chile	ISO 14001-certified installations/sites	MW	km
Thermal power plants	All	**2,068**	
Hydro power plants	Abanico, Antuco, Cipreses, Curillinque, El Toro, Isla, Loma Alta, Los Molles, Ojos de Agua, Palmucho, Pangue, Pehuenche, Ralco, Rapel, Sauzal, Sauzalito	**3,456**	
Wind power plants	All	**78**	
Power grid	All		**15,824**

Colombia	ISO 14001-certified installations/sites	MW	km
Thermal power plants	All	**411**	
Hydro power plants	All	**2,455**	
Power grid	All		**53,341**

Costa Rica	ISO 14001-certified installations/sites	MW
Hydro power plants	All	**31**
Wind power plants	All	**24**

Panama	ISO 14001-certified installations/sites	MW
Hydro power plants	All	**300**

Peru	ISO 14001-certified installations/sites	MW	km
Thermal power plants	All	**1,035**	
Hydro power plants	All	**739**	
Power grid	All		**24,144**

Green procurement

The environmental management system of Enel Servizi also encompasses green procurement, i.e. the procurement of products and services having a lower impact on human health and the environment than other products and services that may be used for the same purpose.

In 2011, Enel consolidated its commitment in this field by widening the range of products and services classified as green. This result was obtained by investigating eco-friendly criteria applicable to different types of products and services and monitoring the progress of international green labels (Ecolabel, Nordic Swan, Blue Angel, etc.). Green requirements (consumption of energy, water, raw materials and hazardous substances, use/recovery of packaging materials, emissions of pollutants and noise, waste recycling/reuse) were thus incorporated into the technical specifications of tenders.

The following table shows the results achieved by class of green products and services.

Classes of green products and services	Contracts awarded/orders placed (million €)
Lead accumulators	5.5
Oil- and resin-insulated MV/LV transformers and autotransformers	0.9
Ammonia	17.4
Packaging materials	1.4
Personal computers	10.0
Printer and copier paper	0.2
Office furnishings	3.3
Promotional items and gadgets	/
Demolition of non-industrial installations and buildings	1.3
Construction and maintenance of canals and hydraulic structures	8.8
Application and removal of insulating materials	12.5
Industrial painting	4.5
Routine maintenance of non-industrial buildings	21.6
Cleaning (industrial and non-industrial)	40.7
Management of company canteens, coffee bars and provision of meal vouchers	19.7
Handling and transport of goods/materials and porterage	3.8
Handling, transport and disposal of non-hazardous and hazardous waste	41.0
Total	**192.6**

Green contracts/orders may also be awarded to/placed with suppliers or contractors possessing product certificates, environmental management systems or awaiting certification. The following table shows the total amount of green contracts awarded/orders placed, highlighting their percentage increase in 2011 with respect to the total amount of non-green contracts/orders in the previous two years.

Green contracts awarded/orders placed (million €)

Year	Total contracts/orders	Total green contracts/orders	% green contracts/total contracts
2009	2,104	508	24%
2010	5,947	800	13%
2011	**2,479**	**736**	**30%**

Green procurement also helps progressively increase the percentage of use of recycled materials through their purchase in the market (see EN1 Expendables, page 91).

Environmental reporting

The environmental reporting process is an integral part of Enel's environmental management system. Through ICT-based and structured procedures, its methodology ensures the homogeneity of the collected data. The reporting system allows Enel to check its environmental performance vs. targets and to process the environmental data contained in its publications.

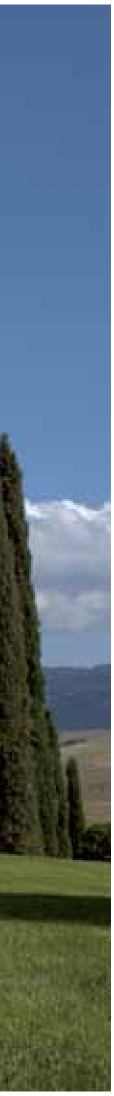
The formats used for collection of both process and governance data are continuously updated to accommodate changes in Enel's organizational configuration, legislative and technological developments, as well as experience feedbacks.

The data are aggregated at the different organizational levels (Business Unit, group of power plants, technology, company, country, division, Group, etc.).

Moreover, a broad range of reporting datasheets (status data, process data, resources, emissions, liquid releases, waste) and indicators (ratios between homogeneous or heterogeneous quantities) are available. These indicators permit to compare the results of the various components of the Group, track their performance over time (regardless of the volume of activities), pinpoint deviations from average or target values and assess the reliability and consistency of the reported data.

Stakeholders

Communication of environmental management efforts to citizens, institutions and other stakeholders is among the strategic targets of Enel's environmental policy. Therefore, the dialogue with stakeholders on environmental aspects is a key ingredient of the policy of Enel in all the countries where it operates.
Relations with international and local institutions, main developments in legislation and regulations on the most significant environmental matters, impact and extent of environmental criticalities and litigations are all dimensions against which to measure progress towards this target.



Relations with institutions

In 2011, Enel strengthened its relations with institutions under a comprehensive and transparent information approach, aimed at improving the level of technical knowledge of institutional counterparts.

This activity took place on two main fronts:
a) consolidation of relations;
b) widening of the range of contacts.
Enel developed its relations with institutional stakeholders at different levels – international, European, national and local – in an integrated way.
At local level, Enel intensified its dialogue with authorities, with a view to reconciling the requirements of industrial development with those concerning land and landscape protection and respect for local communities. This interaction was continuous and intensified upon emergencies or critical stages (granting of authorizations, commencement of works, etc.).
At national level, Enel handled relations with lawmakers and regulators, not only to represent its positions and interests, but also to make available its wealth of knowledge on energy and environmental issues.
At EU level, Enel actively contributed to debates on major environmental issues, e.g. the implementing provisions of the Industrial Emissions, Emission Trading and Energy Efficiency Directives, the "Energy Roadmap 2050", the "Roadmap for Moving to a Competitive Low-Carbon Economy in 2050" and the "Roadmap to a Resource Efficient Europe".
At global level, Enel played an active role in the latest two G20s (Seoul and Cannes), in the Ministerial Meetings of the International Energy Agency, in the UN General Assembly meetings, in the Cancun and Durban Climate Conferences and it will participate in the Rio+20 Earth Summit. Moreover, Enel interacts with non-governmental organizations and multilateral development banks and formally and actively participates in the main associations of the sector and in global fora of consultation over energy and environmental matters.

Main legislative and regulatory developments

European Emission Trading Scheme

European Union

In the European Union, 2011 was the seventh year of operation of the scheme for greenhouse gas emission allowance trading within the Community (European Emission Trading Scheme – EU-ETS – Directive 2003/87/EC). The scheme sets yearly caps to emissions by allocating tradable emission allowances to the covered installations. Free allocation of allowances, which has so far represented the reference criterion, will be progressively replaced by an auctioning mechanism. Indeed, beginning in 2013, at least 50% of allowances will be allocated with this mechanism. In particular, the thermal generating sector will have to procure 100% of its requirements under this mechanism (some derogations may be granted to support the modernization of this sector in East-European countries).

In June 2011, at the proposal of the European Commission, restrictions were introduced on the use of credits from Clean Development Mechanism (CDM) projects for destruction of HFC23 and N_2O. As from May 1, 2013, these credits will no longer be allowed to be used by EU-ETS operators towards compliance with their obligations.

In the course of 2011, the EU-ETS Auctioning Regulation (establishing a common auction platform) was revised. The new Regulation defines, among others, the volume of emission allowances (120 million tonnes) which may be auctioned before 2013. Member States will be required to allocate at least 50% of the revenues from the auctions to investments in renewable-energy and low-carbon technologies.

Also the EU-ETS Registries Regulation was amended in view of the transition of national registries to the European Single Registry, to be activated in the course of 2012. The new Regulation also marked the beginning of a number of measures aimed at enhancing the security and transparency of the European emission allowance market and at preventing the recurrence of thefts and frauds of allowances, such as those perpetrated in 2010.

Finally, in December 2011, the European Investment Bank (EIB) started selling the 300 million emission allowances set aside in the New Entrants Reserve (NER 300). The revenues from the sale will be used to fund pilot projects in the areas of innovative renewable-energy and carbon capture & storage (CCS) technologies.

The following are the key data of the 2008-2012 National Allocation Plans (NAPs) adopted by the Member States where Enel has EU-ETS installations (combustion installations with a thermal capacity of over 20 MW).

Ireland

In 2011, CO_2 emissions were equal to 0.07 Mt vs. NAP allocations of 1.4 Mt.

Italy

In 2011, CO_2 emissions from Enel's plants in Italy were equal to 36.8 Mt vs. NAP allocations of 31.86 Mt.

Law 111 of July 19, 2010 provided that the new entrants' plants excluded from the free allocation should receive – on an ex-post basis and at market values – the emission allowances for which they were eligible. With its Resolutions 16/2010 and 23/2011, the national committee in charge of managing the implementation of Directive 2003/87/EC completed the allocation of allowances to the generating units which went into service in the 2009-2010 period. In particular, 23.3 million allowances were allocated to Enel's Torrevaldaliga Nord plant for the 2009-2012 period.

Portugal

In 2011, emissions were equal to 1.5 Mt vs. NAP allocations of 2.7 Mt.

Slovakia

The Slovak Environment Ministry allocated an average of 5.4 Mt/yr to Slovenské elektrárne for the 2008-2012 period. In 2011, the company produced about 2.97 Mt of emissions.

Spain

Emissions in 2011 were equal to roughly 34.5 Mt; the allowances allocated by the NAP were equal to 24.4 Mt.

Use of renewables

The promotion of the use of renewables for energy production is a topic of major relevance to Enel, considering its strong involvement in the sector. The role of renewables in the global and European energy scenario and the commitment to their deployment are testified by major development targets to be reached in the next decade.

With its Climate and Energy Package, the EU set a target of a 20% share of renewable energy in final energy consumption by 2020. Additionally, Directive 2009/28/EC provides that each Member State shall adopt a National Renewable Energy Action Plan (NREAP) setting out the roadmap and the support schemes for attaining the target.

The NREAPs indicated that renewables in Europe are supported under different schemes. The chief ones are as follows:

> feed-in premium, i.e. a premium on top of the price of electricity per MWh generated from renewables;

> feed-in tariff, i.e. a tariff including a premium and the value of electricity per MWh generated from renewables;

> mandatory quotas (or Green Certificates), i.e. the obligation falling on producers or sellers to give proof that a given share of generation comes from renewables; this obligation is fulfilled by surrendering certificates that give evidence of the renewable origin of electricity. The certificates are tradable on national platforms or over the counter;

> auctions, i.e. mechanisms aimed at granting support for electricity generation from renewables through special auctions.

Therefore, no homogeneous EU-wide support scheme exists. The different energy strategies, as well as the different geographic configurations of Member States, resulted into different and non-harmonized support schemes.

The year 2011 saw multiple legislative/regulatory revisions, most of which radically cut the amount of incentives. At present, many European countries are debating on the revision of support schemes and tariff levels, owing to the unexpected growth of the capacity installed in renewable-energy plants and to the sharp reduction in costs due to technological advances.

At non-EU level, the main renewable-energy support schemes are State auctions and tax incentives.

The following paragraphs give a concise picture of the legislation/regulations applicable in the various countries where Enel generates electricity from renewables.

Bulgaria

The Bulgarian support scheme is mostly based on feed-in tariffs that are differentiated by source. Eligible plants are as follows: on-shore wind, photovoltaic and hydro with a capacity of less than 10 MW; and biomass-fired with a capacity of less than 5 MW. By amending the law on renewables, the Government shortened the support period from 15 to 12 years for all renewable-energy plants, except for photovoltaic ones for which the period was reduced from 25 to 20 years. Furthermore, the Government decided to set tariffs on a yearly basis (June) in constant values (without indexing) throughout the support period.

France

Electricity generation by hydro, on-shore and off-shore wind, biomass, biogas, photovoltaic (PV) and geothermal power installations is supported through feed-in tariffs (differentiated by source), based on an inflation-adjusted long-term contract (15 years for geothermal, on-shore wind and biomass; 20 years for off-shore wind, PV and hydro).

Unlike other renewable-energy installations, PV ones benefit from a more complex support scheme: tariffs change quarterly on the basis of a coefficient that measures the level of capacity demand in the previous quarter. To ensure the development of off-shore wind and ground-mounted PV installations or of those with a capacity exceeding 100 kW, the French Government introduced auction mechanisms. The French system also involves other forms of support which are decided year by year based on the available budget, e.g. accelerated depreciation and tax deductions of up to 33% for investments in the French overseas departments.

Greece

In the Greek support scheme, feed-in tariffs differentiated by source are dominant. Tariff levels for all sources are annually indexed on the tariffs of the Public Power Corporation (PPC) – if they are regulated – or on 80% of the Consumer Price Index (CPI), except for those for PV installations, which are indexed on 25% of the Greek CPI. Incentives are granted under a long-term contract of 20 years for all sources/technologies, except for roof-mounted PV installations with a capacity of less than 10 kW, for which the contract duration is 25 years. Renewable-energy installations not benefiting from (local or European) investment support schemes, except for solar ones, may get a 15-20% increase of their feed-in tariffs.

Italy

In Italy, electricity generation from renewables is supported under schemes which are differentiated by source and by capacity of the installation.

The main mechanism supporting renewables in Italy is the Green Certificates scheme. The scheme requires producers and importers of conventional electricity to inject a given quota of renewable electricity into the power system, also by purchasing Green Certificates from other renewable power producers. The quota obligation is now equal to 6.8% of the non-renewable electricity generated by each operator.

The extent of the incentive depends on the market value at which the obliged parties may purchase the certificates for fulfilling their obligation. This market value is delimited by a maximum and a minimum. For 2011, the maximum value was equal to 113.1 €/MWh, whereas the minimum value was 87.38 €/MWh. A coefficient accounting for the different generation costs is applied to each source.

As an alternative to the Green Certificates scheme, installations with a capacity lower than or equal to 1 MW (200 kW for wind farms) may have access to an all-inclusive feed-in tariff scheme for a period of 15 years.

PV installations are supported under the "Conto Energia" feed-in premium scheme (feed-in premium not including the value of electricity) over a period of 20 years. A Ministerial Decree updated the scheme (4th feed-in scheme) in May 2011. The scheme involves a target of installed capacity of 23 GW to be reached by 2016 and non-binding scheme-cost ceilings for each half-year from 2013 to 2016. If these thresholds are exceeded, feed-in tariffs are further reduced in the subsequent half-years with respect to the levels established in the Decree. A binding scheme-cost ceiling applies to large-sized plants but only for the 2011-2012 period.

Legislative Decree 28/2011, transposing Directive 2009/28/EC, revised the current support schemes. The revision will be implemented under appropriate Ministerial Decrees. In particular, the new support scheme will replace the Green Certificates one with a tariff and Dutch auction mechanism, whereas PV installations will continue to benefit from the feed-in premium scheme.

The new scheme will be applied to installations going into operation from 2013 on and will be differentiated by size of the installation: the tariff system will be applied to the smallest installations, whereas incentives will be awarded to the largest installations under the Dutch auction mechanism.

Romania

In Romania, the main scheme of support for all renewables is the Green Certificates one, except for hydro plants with a capacity exceeding 10 MW, which do not benefit from any support scheme. Sellers are required to purchase every year a given quota of renewable electricity by purchasing Green Certificates (GCs) on the basis of yearly targets established by the applicable legislation in terms of quotas of gross renewable electricity generation (8.3% in 2010 to 20% in 2020). Owing to insufficient supply of GCs in the market, the Romanian regulator yearly publishes the mandatory quota revised downwards in order to balance demand with supply. The value of the certificates is variable, depending on the application of multiplication coefficients that are differentiated by source: 2 GCs per MWh of electricity generation by biomass-fired, geothermal and wind installations (1 GC after 2017); 6 GCs per MWh of generation by PV installations; 3 GCs per MWh of generation by new hydro installations. This value (€/GC) is set by the applicable legislation within a cap & floor range. In case of non-compliance, sellers pay a penalty, which is now equal to twice the maximum value of the certificate.

Spain

The Spanish renewable-energy support system, updated by Royal Decree 661/2007, is mostly based on feed-in tariffs and feed-in premiums. All installations which were in service before January 1, 2008 had the option of choosing one of the two support schemes by January 1, 2009. After this date, the exercise of the option was frozen for the entire support period. As regards the feed-in premium scheme, Royal Decree 661/2007 set the value of the incentive within a cap & floor range, differentiated by source.

Since September 28, 2008, PV installations have been covered by special rules (Royal Decree 1578/2008). All PV installations have access to the feed-in tariff scheme only; the tariff levels are updated upon four yearly time-windows ("convocatorias"), based on the capacity registered in the previous reference period. Both feed-in tariffs and premiums are yearly inflation-adjusted. In 2009, criteria were established for the creation of a pre-registry, which allows the projects falling under the special regime to have access to the support scheme. These projects have access to the pre-registry only if they have obtained the relevant authorizations and if the commissioning of the related installations is guaranteed to occur within a specified time limit. Furthermore, Royal Decree 1614/2011, Royal Decree 1565/2011 and Law 14/2010 made some amendments to the existing schemes. The main ones reduced the premium for a number of wind farms already in service and limited the hours of operation eligible for the incentive.

Brazil

The Brazilian renewable-energy support scheme was established in 2004. The scheme, initially based on feed-in tariffs, was subsequently harmonized with the system of sale of conventional electricity, i.e. auctions. The currently applicable auctions, called A-3, are not differentiated by source (renewable and conventional electricity). A-3 auctions may be of two types:

> A-3 auctions for reserve capacity – all the volume of electricity covered by Power Purchase Agreements (PPAs) is required to be sold; this system ensures the ex-ante entry of a given volume of electricity into the grid;

> A-3 auctions for energy – only part of the electricity covered by PPAs falls under the auction mechanism, whereas the remaining part may be autonomously managed by the operator.

The Brazilian auction mechanism applies to all renewable-energy installations, except for hydro ones with a capacity exceeding 30 MW.

Chile

Chile has a mandatory renewable quota system. The quota, equal to 5% from 2010 to 2014, will increase by 0.5 percentage points per year until reaching 10% by 2024. The quota is determined on the basis of the electricity contractualized after August 31, 2007. Although the Chilean system involves tradable certificates, no centralized trading platform is currently available. The system establishes penalties for non-compliance with the quota obligation. In case of non-compliance, producers will have to fulfill their obligation in the subsequent years, otherwise their penalties will increase.

The Chilean Government proposed to revise the mandatory quota upwards, i.e. from 10%, now to be reached by 2024, to 20% by 2020. All renewable-energy installations are subject to the quota obligation, except for hydro ones with a capacity of over 20 MW.

Mexico

In Mexico, the renewable-energy support scheme is mostly of a fiscal nature. Other forms of support are mandated by the applicable legislation, e.g. investment support via accelerated depreciation and lower transmission tariffs. The parties benefiting from the above-mentioned incentives include: Independent Power Producers (IPPs), small generators (< 30 MW) and self-producers. Whereas IPPs and small generators sign a long-term contract with Comisión Federal de Electricidad, self-producers sign bilateral contracts directly with consumers.

Peru

The Peruvian renewable-energy support scheme, introduced in 2010, is based on auctions differentiated by source. Auctions are defined in terms of energy for wind, solar and biomass-fired installations and in terms of capacity for hydro plants. Hydro plants with a capacity exceeding 20 MW are not eligible for support. Auctions involve a maximum bid price and are closed at the offered price (pay-as-bid mechanism). This price may be adjusted on the US CPI, if the increase exceeds 5%.

USA

The US system has a dual level of support for renewables: i) at federal level, Production Tax Credits and Investment Tax Credits, accelerated depreciation and federal subsidies; ii) at State level, Renewable Portfolio Standard (RPS), or mandatory quotas falling on utilities and targets differentiated by State. Most of the States adopted tradable certificates but no federal-level trading platform is yet active.

Energy efficiency

Europe

The European Parliament and the Council started discussions on the proposed Energy Efficiency Directive (EED) that the European Commission published on June 22, 2011. The EED is expected to group energy efficiency provisions into a single document, repealing two existing Directives: the Cogeneration Directive and the Energy Services Directive. After approval of the Climate and Energy Package, the political debate over energy efficiency has been characterized by regulatory uncertainty; the most critical elements are the nature of the target (binding or voluntary) and, more generally, the regulation to be introduced at EU level. The content of the proposed EED may be outlined as follows:

> Member States will be held to establish energy-saving schemes: targets assigned to energy distributors or sellers in terms of end-use energy efficiency measures; and alternative schemes (funding programs or voluntary agreements) capable of yielding the same results without any obligation for companies;

> public bodies will have to promote the dissemination of energy-saving products and services in the market; they will be subject to the legal obligation of purchasing energy-efficient buildings, products and services; and they will have to progressively reduce energy consumption in their buildings, by carrying out yearly works of renovation on at least 3% of the total surface of their building stock;

> measures will be put in place to help consumers save energy; consumers must have an easy and free-of-charge access to the data concerning their energy consumption in real time and its evolution, by relying on more accurate individual meters; invoices should be based on actual usage, i.e. on meter readouts;

- SMEs will be encouraged to get energy audits and disseminate best practices; energy audits in large companies will be mandatory;
- Member States will have to monitor the efficiency of new energy production capacity and draw up national heating & cooling plans, in view of planning infrastructures that are efficient and that also recover waste heat; to achieve this target, preference will be given to combined heat & power solutions for new installations or for installations whose authorizations are to be renewed;
- in 2014, the Commission will assess the progress made towards the EU target of reducing energy consumption by 20% by 2020 compared to projections and, where necessary, submit a new legislative proposal laying down mandatory national energy efficiency targets.

Italy

Support for end-use energy efficiency has been based in Italy on the Energy Efficiency Certificates scheme, introduced on January 1, 2005.

National energy-saving targets were set for the years from 2005 to 2012. Every year, Autorità per l'Energia Elettrica e il Gas (AEEG - the Italian electricity & gas regulator) allocates these targets among the largest electricity and gas distributors. By May 31 of every year, each obliged distributor must surrender to AEEG a number of certificates equal to at least 60% of the obligation pertaining to the previous year.

Distributors may meet their targets both by implementing energy efficiency projects and by buying the certificates that they need in an appropriate regulated market or over the counter. Annex 1 to the Ministerial Decrees of 2004 specifies the eligible projects. Legislative Decree 28/11 extended the number of eligible projects by including those aimed at increasing energy efficiency on the power distribution grid.

Also energy service companies may implement specific energy efficiency projects. The projects are subject to the approval of AEEG, which notifies Gestore del Mercato Elettrico (GME) of the achieved savings, so that GME may issue the relevant certificates.

To partially cover the costs incurred to attain the target, AEEG established a tariff contribution (86.98 €/toe for 2012) to be paid to distributors. The contribution is determined by taking into account the evolution of the prices of electricity, gas and gas oil for heating.

In 2011, AEEG revised its guidelines on the preparation, implementation and evaluation of energy efficiency projects by introducing, among others, a multiplication coefficient of the certified yearly savings resulting from energy efficiency measures, so as to incentivize the implementation of more structural projects and increase the supply of certificates in the market.

Moreover, AEEG set the energy efficiency target for the year 2012. For Enel Distribuzione, this target is equal to roughly 3 Mtoe.

New National Energy Efficiency Action Plan

In 2011, the Ministry of Economic Development submitted its new National Energy Efficiency Action Plan (NEEAP) to the European Commission. The document systematically reviews the energy efficiency projects completed and the results achieved and analyzes areas of further action. The Plan extends the target set in the previous NEEAP (10.88 Mtoe by 2016) to 2020 and estimates 15.9 Mtoe of savings in final energy consumption (equivalent to 18 Mtoe in terms of primary energy).

Spain

In compliance with Directive 2006/32/EC on energy efficiency, the competent Ministry issued its second NEEAP, after a public consultation which began on June 15 with the publication of the draft.

The target is to cut energy consumption by 20% on 2007, in accordance with the target set by the European Council on June 17, 2010 and included in the recently proposed Energy Efficiency Directive. The plan has the purpose of reducing final energy intensity (final energy consumption per unit of GDP) by 2% per year from 2011 to 2020. This implies saving 965 million barrels of oil and 400 million tonnes of CO_2 emissions in the 2011-2020 period.

The reduction obtained in the 2007-2010 period was equal to 9.2%, thus advancing the achievement of the 9% target set by 2016 by the European Directive.

The NEEAP estimates that financial savings will reach € 79 billion and that the required investments will be equal to nearly € 46 billion (of which € 5 billion managed by the public sector).

The public budget will cover 23% (about € 1,000 million) of the funds managed by the Government, whereas the energy sector will cover the remaining 77% (about € 4,000 million).

The share to be covered by the public budget will depend on available funds and will be approved on a yearly basis. However, it should be pointed out that this plan, just as the previous ones, has an indicative and non-binding nature.

Other environmental legislation/regulations

In 2011, the European Parliament began its analysis of the revision (proposed by the European Commission) of Directive 96/82/EC on the control of major-accident hazards involving dangerous substances ("Directive Seveso II").

The revision is aimed at: aligning the definition of the substances and of the amounts indicated in the Directive with the one of CLP-Regulation (EC) 1272/2008 on classification, labeling and packaging of hazardous substances and mixtures; introducing provisions on public access to safety information, participation in the decision-making process and access to justice in accordance with the Aarhus Convention; and introducing stricter standards for inspections of establishments.

In 2011, within the European Integrated Pollution Prevention and Control Bureau (Seville), a technical working group was set up with the task of revising the Best Available Techniques Reference Document (BRef) on large combustion plants (LCP). The LCP BRef is a sector-specific guidance document describing the reference performance requirements, based on the best available and economically viable techniques, to be met by plants under the Industrial Emissions Directive (2010/75/EC).

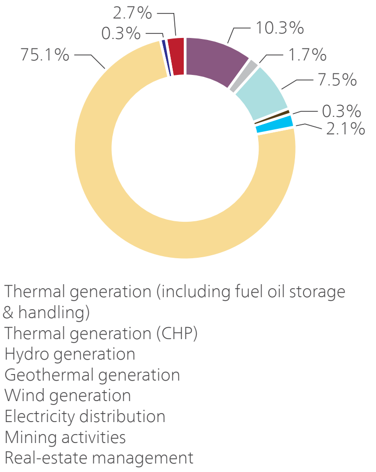
On September 20, 2011, the European Commission published its "Roadmap to a Resource Efficient Europe". The document contributes to the debate on efficient use of natural resources and proposes policies to achieve a resource-efficient Europe. On one hand, the Roadmap focuses on targets related to transforming the economy, e.g. improving products, changing consumption patterns, boosting efficient production, turning waste into a resource, supporting research and innovation, phasing-out environmentally harmful subsidies (e.g. for fossil fuels, transportation and water) and shifting from labor taxation to environmental taxation. On the other hand, in more strictly environmental terms, the Roadmap proposes targets of enhancement of the value of goods and services provided by ecosystems, biodiversity conservation, efficient use of minerals and metals, optimization of water consumption and reuse patterns, air quality and minimization of impacts on land, soils and marine resources.

EN28 Environmental criticalities

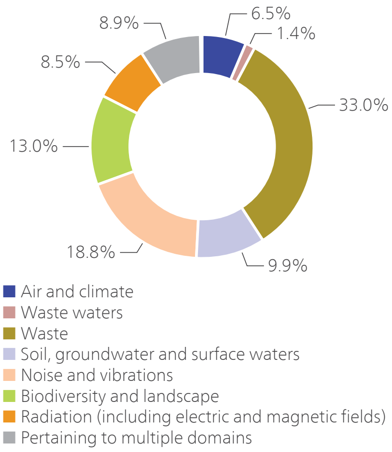
Environmental criticality means the rejection of, opposition to or complaint about the impact due to the operation of installations (power plants, grids, substations, buildings, etc.). This position is expressed – for obvious reasons – by a third party feeling disturbed, damaged or threatened by present or future installations. Environmental opposition translates into public or private initiatives, which may involve significant costs owing to denied authorizations, suspensions of works, modifications of installations, etc. Examples are administrative measures, letters before action, written protests (direct or through the press), actions by mass media, as well as verbal complaints (when local complaint desks or offices are available). Each protest concerning the same installation corresponds to a different criticality. The criticality ceases with the end of the circumstances generating it. In any case, environmental litigations are excluded from environmental criticalities. The use of the most rigorous and advanced organization and management measures cannot avoid the occurrence of environmental criticalities, which originate from various factors, including the excessive emphasis that the media place on some issues, thus inducing particular expectations among communities.

In 2011, the number of environmental criticalities was equal to 293. Their increase with respect to previous years is due to improvements in the ways in which criticalities are identified in all the countries where Enel operates and to the extension of the monitoring activity to construction sites.

Environmental criticalities as of Dec. 31, 2011
(by business or line of activity)
Total: 293



Environmental criticalities as of Dec. 31, 2011
(by environmental domain)
Total: 293



The following is a description of the criticalities, grouped by type, and of the measures taken.

Public opposition to construction of some hydro plants in Chile (Aysen dam project) and Colombia (Quimbo dam project) owing, among others, to the planned flooding of land areas (for details, see Sustainability Report, Chapter 6, "Citizens of the world", 6.2.2 "Projects in progress").
Relations with stakeholders

Press articles against the presence of some plants in Italy (Livorno, Piombino) and public opposition to construction of the Bagnore geothermal plant in Italy and of the Pedras Negras wind farm in Spain.
Relations with stakeholders and power-plant open-house initiatives

Detection of high iron and manganese values in the piezometers installed at the boundaries of the Porto Empedocle plant site (Italy).
Submission of the site characterization plan to competent authorities

Impact of the power grid on biodiversity and landscape in Spain, Brazil and Colombia (logging of trees).
Request for authorization, payment of charges and reduction of logging

Impact of the presence and operation of hydro plants (Paraíso, Muña, Limonar, La Junca, Guavio, Betania) and thermal plants (Termozipa) on land and local fauna in Colombia.
Biodiversity monitoring and conservation

Concerns and notices about electric & magnetic fields from power grids, especially in Colombia and Italy.
Verification of compliance with applicable limits via monitoring surveys

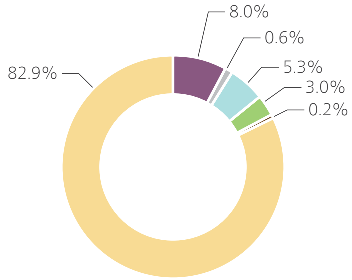
Noise produced by power grid transformers in Argentina (Alberdi, Falcón and Villa Crespo substations), Colombia and Spain (Guanarteme substation, Canary Islands).
Noise monitoring plans, abatement measures and replacement of components

Notices or administrative measures issued by competent bodies concerning: operation of thermal plants in Russia (Reftinskaya, Sredneuralskaya, Konakovskaya) and Spain (Punta Grande, Candelaria, Foix, Sant Adrià, Besòs 3 and 5); operation of hydro plants in Brazil (Cachoeira Dourada) and Spain (UPH Ebro-Pyrineos); electricity distribution grid in Romania (station of Militari); waste management during works on the electricity distribution grid in Peru.
Provision of documents giving the necessary clarifications and specific actions

EN28 Environmental litigations

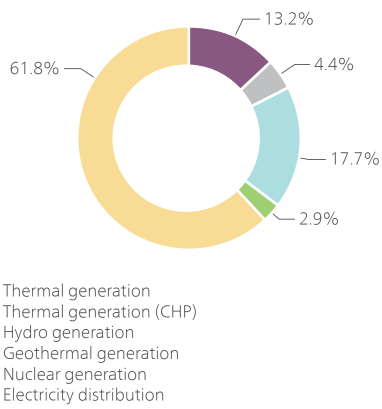
Environmental litigations pending as of Dec. 31, 2011 and initiated before 2011 (by business activity)

Total: 540



Environmental litigations initiated in 2011 (by business activity)

Total: 68



The civil and criminal proceedings described below are only those where Enel was sued or prosecuted and those which arose from third parties' appeals seeking the quashing of administrative judgments in favor of Enel ("passive litigations").

As of December 31, 2011, Enel had 608 pending judicial proceedings (about 83% related to its electricity distribution grid), of which 540 pending from previous years. In 2011, 55 proceedings were closed. The data of 2011 are not directly comparable with those of 2010 (1,295 pending judicial proceedings), because the criteria for identifying and reporting the litigations have been fine-tuned and this process has affected in particular the data on electricity distribution in Catalonia.

The following table summarizes the most significant litigations.

Authorizations

Alleged lack of authorizations for: i) thermal generation in Italy (Bari, Mercure-province of Cosenza, Porto Tolle-Rovigo, Torrevaldaliga Nord-Rome, Santa Barbara-Arezzo); ii) construction of some distribution lines in Spain (Canary Islands); iii) hydro generation in Brazil (Cachoeira Dourada); and iv) construction of the El Quimbo dam in Colombia.

Depositions

Alleged damage to the environment or to property caused by emissions into the atmosphere from plants in Italy (Brindisi, Livorno, Mercure-province of Cosenza, Panarea-Messina, Porto Tolle-Rovigo, Torrevaldaliga Nord-Rome, Porto Empedocle-Agrigento) and in Argentina.

Waste

Waste management with allegedly irregular authorizations in thermal generation in Italy (Brindisi, Augusta Business Unit-province of Siracusa, Mercure-Cosenza), in Spain (Salinas) and Argentina.

Releases into water bodies

Exceedance of limits of releases into water bodies in power generation in Italy, both thermal (Brindisi, Porto Tolle-Rovigo, Porto Marghera-Venice, Torrevaldaliga Nord-Rome) and hydro (Sondrio, Vittorio Veneto Business Unit, Cuneo Business Unit), and in thermal generation in Spain (Salinas) and Argentina.

Water use

Alleged damage to groundwater caused by the operation of plants in Italy (Brindisi).

Noise

Noise and vibrations due to thermal generation in Italy (Montalto di Castro-Viterbo, Presenzano-Caserta) and in Chile.

Electric and magnetic fields

Electric and magnetic fields associated with electricity distribution in Italy, Spain and Latin America. Enel Distribuzione and Endesa are defendants in various proceedings requiring the relocation of portions of the power grid or the change of its mode of operation on grounds of alleged damage induced by the installations.

Radiation

Appeal against the penalty inflicted for exceedance of limits of radioactive releases from the Ascó plant in Spain.

Damage from fires

Alleged damage from fires caused by electricity distribution in Spain (Catalonia).

Damage to the environment

Alleged damage from pollution in hydro generation in Colombia (Muña basin).

Damage to flora and fish fauna

Alleged damage to flora and fish fauna associated with management of minimum in-stream flows, sediment flushing-out and removal in hydro generation in Italy (Sondrio, Vittorio Veneto-Treviso), Brazil (Cachoeira Dourada) and Colombia (Tominé basin and Betania plant).

Damage from flooding

Alleged damage from flooding caused by hydro generation in Chile (Pangue).

Damage to vegetation

Damage due to cutting of vegetation in electricity distribution in Colombia and Brazil.

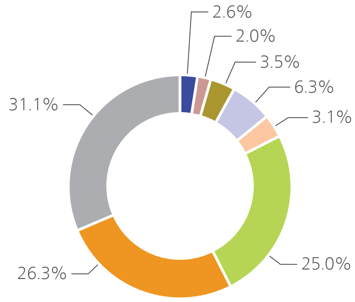
Possible adverse outcomes and negative effects of pending litigations are unpredictable. Therefore, they have not been included in the "Provision for litigations, risks and charges" of Enel's Consolidated Financial Statements 2011. The consequences of these litigations might range from compensation for damages to costs to be incurred for modifying installations or due to their temporary unavailability.

In 2011, the monetary value of environmental penalties was equal to approximately € 250,000.

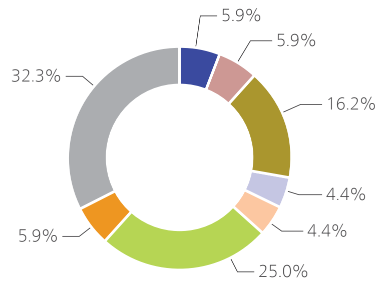
This figure is not directly comparable with the one of 2010 owing to improvements made to the reporting system. The penalties chiefly include:

> compensation for damage to forestry and agriculture in Slovakia;
> fines for liquid releases, fires and damage to biodiversity in Spain;
> compensation for damage to fish farms caused by liquid releases from the condenser of the Sredneuralskaya plant in Russia;
> compensation for damage caused by the emptying of the Riolunato dam in Italy.

Environmental litigations pending as of Dec. 31, 2011 and initiated before 2011 (by environmental domain)
Total: 540



Environmental litigations initiated in 2011 (by environmental domain)
Total: 68

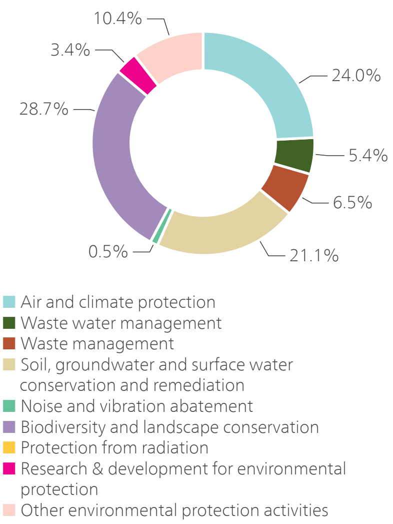


- Air and climate
- Waste waters
- Waste
- Soil, groundwater and surface waters
- Noise and vibrations
- Biodiversity and landscape
- Radiation (including electric and magnetic fields)
- Pertaining to multiple environmental domains

Environmental commitment

EN30 Financial resources

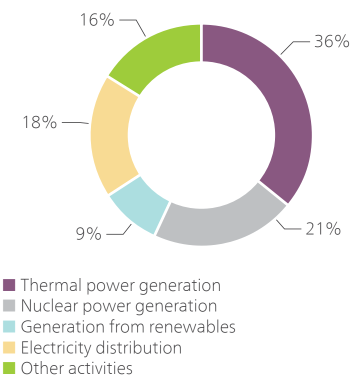
Overall environmental investments in 2011
(by environmental protection activity)
Total: € 251 million



Enel records its environmental expenditure (investments and current expenditure) according to a classification system based on the criteria adopted by Eurostat/Istat, under which "environmental protection expenditure" is defined as the costs incurred for preventing and mitigating environmental pollution and degradation and for restoring the quality of the environment, whatever the origin of such costs (legislation, agreements with local Governments, corporate decisions, etc.). Costs incurred to purchase emission certificates are recorded separately, taking into account GRI EN30 (1) criteria. The environmental expenditure excludes the costs incurred for minimizing the use of natural resources, as well as for activities that, albeit environmentally beneficial, primarily satisfy other requirements, such as health & safety in workplaces. The term "expenditure" always has an algebraic meaning, as it may also refer to revenues, such as those which may accrue from waste delivery to recovery operators.

(1) Owing to the revision of the method of accounting of GRI expenditure items, the values of 2009 and 2010 are different from those published in the Sustainability Report 2010. In particular, the values of "current expenditure for waste disposal, emission abatement and environmental restoration" in the three-year period do not consider environmental liability insurance policies and depreciation charges for environmental protection investments for the following reasons: i) under the current method of accounting, insurance premiums cannot be associated with specific environmental cost items in a reliable way; and ii) investments are reported as such, as their depreciation charges have not yet been defined in a uniform way.

Financial resources allocated to environmental protection as of Dec. 31, 2011
(by business or line of activity)
Total: € 739 million



Group's financial allocations for environmental protection in 2011

Business/line of activity (€ million)	Investments	Current expenditure	Total	%
Thermal generation	68	197	265	35.9
Nuclear generation	8	147	155	21
Electricity generation from renewables	22	44	66	8.9
Electricity distribution	93	37	130	17.6
Other activities (including mining and environmental support activities (1))	60	63	123	16.6
Total	**251**	**488**	**739**	**100**
Emission certificates	*/*	*94*		
Total expenditure under the GRI criteria	**251**	**582**	**833**	

(1) "Environmental support" means the activities of consulting and guidance not pertaining directly to a specific business or line of activity.

EN26 Investments

€ 68 million
Thermal generation

€ 8 million
Nuclear generation

€ 22 million
Electricity generation from renewables

€ 93 million
Electricity distribution

The most significant investments on **thermal plants** were as follows:

- improvements to SO_2, NO_X and particulate emission abatement systems (plant system upgrades to comply with emission limits and modernization of desulfurizers, denitrification and particulate abatement systems, the latter especially in coal-fired plants);
- installation of new low-NO_X burners;
- revamping and remediation of some tanks for fuel oil storage & handling and upgrades of passive protection systems (containment basins in fuel storage areas and fire prevention systems);
- handling, transport and storage of gypsum and ash;
- renovation and modernization of systems for treating liquid releases (desulfurizer drainage, waste water and sewage water);
- new systems for monitoring and analyzing flue gases;
- characterization of contaminated sites, planning/design and implementation of rehabilitation projects;
- morphological, hydrographic and landscape restoration in mining areas;
- removal of asbestos-containing materials;
- decontamination of PCB-contaminated oils and machinery.

Investments on **renewable-energy installations** were as follows:

- upgrades of transformer-oil collection tanks;
- retrofitting of outlets;
- desilting of basins;
- consolidation of some channels/canals and of landslide-prone slopes;
- improved methods to collect materials removed from the trashracks of intake structures;
- noise abatement in installations and replacement of noisy generators;
- construction of infrastructures to safeguard faunal communities near installations;
- better integration of installations into the environment;
- retrofitting of intake structures to release the minimum in-stream flow into water bodies;
- construction of fish ladders;
- testing of a new system for microorganism-based clean-up of channels/canals.

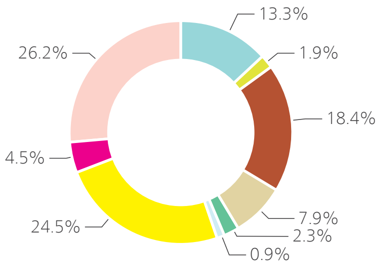
The main investments on **nuclear plants** were as follows:

- removal of asbestos;
- management of hazardous and radioactive waste;
- replacement of magneto-thermal circuit breakers (containing SF_6 and oil) with vacuum circuit breakers;
- replacement of R22 gas in air conditioning systems with non-ozone-depleting gases;
- management of waste waters;
- improvement of the cooling system of the Almaraz plant (Spain): replacement of various mini-cooling towers to lower the temperature of the water returned to the basin.

Investments on **electricity distribution** installations were as follows:

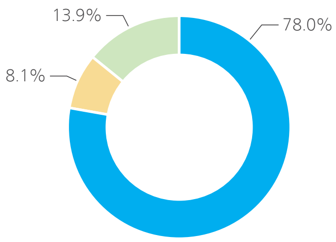
- disposal of PCB-contaminated equipment;
- use of overhead or underground cables in power lines to conserve biodiversity and landscape; the following extra cost items are recorded as environmental investments: overhead and underground cables in place of bare conductors in medium-voltage lines in areas of low population density; underground cables in place of overhead cables in low-voltage lines in the above areas; underground cables in place of bare conductors in high-voltage lines, whatever their location.

Current environmental expenditure in 2011, excluding extra fuel costs [(1)]
(by environmental protection activity)
Total: € 453 million

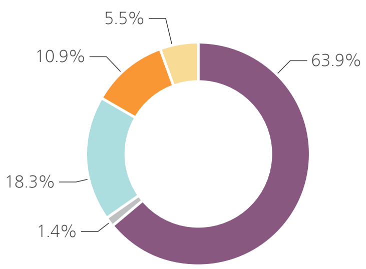


(1) "Extra fuel costs" are the extra costs incurred to purchase fuels with a lower environmental impact.

Current environmental expenditure in 2011, excluding extra fuel costs
(by business or line of activity)
Total: € 453 million



Financial resources allocated to research as of Dec. 31, 2011
(by business or line of activity)
Total: € 97 million



EN26 Current expenditure

The current environmental expenditure of 2011 is almost entirely attributable to electricity generation.

The main items of expenditure, divided by business or line of activity, are as follows:

Thermal generation

- industrial clean-ups connected with plant operation (handling and removal of liquid releases and by-products)
- delivery of coal ash to waste operators
- analysis and characterization of waste and liquid releases
- maintenance of flue-gas desulfurization and environmental monitoring systems
- maintenance of crystallizers and waste water treatment systems
- environmental restoration
- noise monitoring surveys
- awareness, training & education

Nuclear generation

- protection from radiation
- radioactive waste management
- industrial clean-ups connected with plant operation (handling and removal of liquid releases and by-products)
- analysis and characterization of waste and liquid releases
- maintenance of waste water treatment systems and environmental restoration
- noise monitoring surveys
- awareness, training & education

Electricity distribution

- water- and leak-proofing and clean-up of oil spills
- analysis of liquid releases
- waste management
- noise monitoring surveys
- awareness, training & education

Electricity generation from renewables

- monitoring of groundwater
- waste management
- maintenance of septic tanks
- reforestation
- programs of prevention of pollution from chemical substances (geothermal activities)
- qualitative analysis of waters used
- noise monitoring surveys
- removal of sediment from trashracks
- fish restocking
- maintenance of hydraulic structures to keep them efficient and without risks to the environment

The above expenditure includes (in part as investments and in part as current expenditure) the **research** items shown (in million €) below.

Business or line of activity	Total (million €)	%
Thermal generation	62.0	63.9%
Nuclear generation	1.4	1.4%
Electricity generation from renewables	17.7	18.3%
Energy efficiency	10.6	10.9%
Electricity distribution	5.3	5.5%
Total	**97.0** (1)	**100.0%**

(1) This value includes € 29.6 million of financings.

Other items of expenditure accrued in financial year 2011 (not explicitly allocated to environmental protection and thus separately recorded) include the purchase of Green Certificates (€ 155 million) to comply with the green quota obligation.

EN18 Climate strategy

Enel recognizes the centrality of the fight against climate change among its responsibilities as a large global energy operator and has long initiated actions to cut down greenhouse gas emissions in all the countries where it operates.

Enel's commitment to responding to climate change challenges is driven both by the European Emission Trading Scheme (EU-ETS) and by a long-term vision. In fact, Enel's Chief Executive Officer joined Eurelectric's initiative, under which 60 companies are committed to achieving a carbon-neutral European electricity industry by 2050.

Enel is thus working on a broad range of short- and long-term options in its different areas of activity.

Its strategy rests on five pillars:

> **use of the best available technologies** - the commissioning of new high-efficiency and low-emission plants reduces the carbon footprint of the thermal generating mix;
> **development of zero-emission sources** - Enel continues to invest in renewable- and nuclear-energy technologies;
> **energy efficiency** - programs in this area concern both grids (in particular, development of smart grids) and final customers, so as to stimulate changes in consumption patterns, also through beyond-the-meter services and promotion of electric mobility;
> **research & innovation** - growing commitment to innovative technologies for solar energy, carbon capture & storage, smart grids and electric mobility;
> reduction of emissions with **projects in East-European and developing countries**, resorting, among others, to the Kyoto Protocol flexible mechanisms (Clean Development Mechanism and Joint Implementation), in which the Group stands as a worldwide leader.

With respect to 1990, the base year of the Kyoto Protocol, the Group's specific CO_2 emissions decreased by 34%. By 2020, Enel set the target of cutting these emissions by 15% from their 2007 levels.

Enel will continue to slash its emissions and to resort, in part, to international emission credits, encouraging the use and development of market mechanisms to favor investments in low-carbon technologies and reach its targets at the least possible cost.

Enel expects to further curb its emissions, when technologies (e.g. carbon capture & storage) permitting to develop zero-emission generating capacity on a larger scale reach industrial maturity.

This long-term development blueprint calls for a regulatory framework providing stable signals and capable of channeling important and growing investments towards low-emission technologies.

Clean Development Mechanism, Joint Implementation and voluntary initiatives

The Clean Development Mechanism (CDM) and Joint Implementation (JI) are two of the three flexible mechanisms envisaged in the Kyoto Protocol.

In accordance with European directives, companies covered by the European Emission Trading Scheme (EU-ETS) may count the emission credits accrued from CDM and JI projects and certified by the UN towards compliance with their targets.

Under the CD and JI flexible mechanisms, initiatives of greenhouse gas abatement may be implemented in areas where production technologies are obsolete and thus largely improvable at relatively low costs. The resulting technology transfer represents an additional advantage for the sustainable development of emerging and developing countries.

Today, thanks among others to the acquisition of Endesa, the Enel Group is a key player in the global market of credits from flexible mechanism projects, with a share of 12% of emission credits already certified by the UN. In particular, in 2011, Enel's projects displaced almost 44 million tonnes of CO_2 equivalent emissions.

The projects are located in China, India, Africa and Latin America. Direct-participation projects (114) in Enel's portfolio span a wide array of technologies: renewables (hydro, wind and geothermal), industrial gases, biomass, methane destruction, energy efficiency, water and waste treatment.

Mention is to be made of the projects developed in China, which hosts most of the projects in Enel's portfolio (79). In this country, the Group found fertile ground thanks to the Sino-Italian Cooperation Program (SICP), started in 1999 between the Italian Environment Ministry, on one hand, and the State Environmental Protection Administration (SEPA) as well as other Chinese institutions, on the other hand. The Program, which has the purpose of fostering sustainable development projects in China, made it possible to identify the best project opportunities.

Most of the initiatives were developed bilaterally between Enel-Endesa and the host country. With a view to diversifying the implementation and performance risks associated with the individual projects, the Group also invested in some funds, whose expected contribution in terms of credits amounts to about 13% of the total portfolio.

The details of all the projects in which Enel and Endesa act as project participants are available on the UNFCCC website (starting from page http://cdm.unfccc.int/Projects/index.html).

Enel contributed with its CDM experience and climate-change expertise to the initiatives taken by the UN World Food Programme (WFP) to the benefit of the most backward communities. In particular, in June 2011, Enel signed a frame-agreement with the WPF which implies, among others, support for manufacturing and distributing high-efficiency kitchens in some of the least developed countries of the African continent. In the future, these projects may yield emission credits.

Enel is also undertaking emission reduction efforts in sectors not subject to the relevant obligations but of interest to parties (companies, institutions, final customers, etc.) wishing to adopt virtuous greenhouse gas emission mitigation practices.

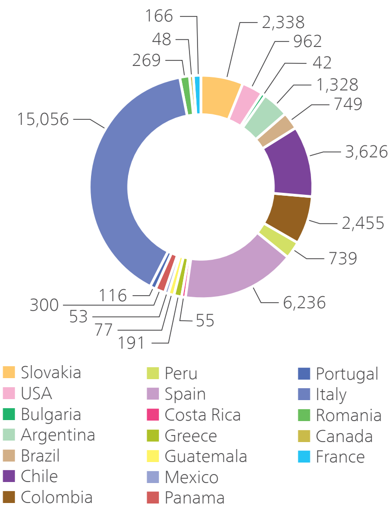
This activity falls under the "voluntary emission market", to distinguish it from the market originating from legislative obligations in terms of emission trading.

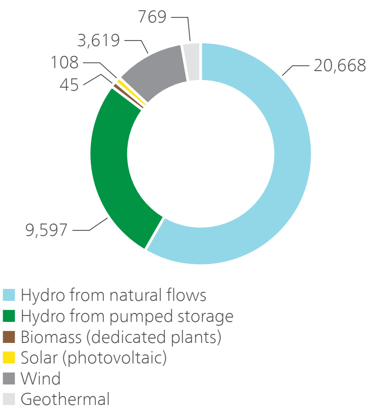
It consists in providing services permitting, among others, to neutralize the carbon footprint of a broad range of activities (social events, energy sales campaigns, publications, products and services).

An example of these services is the "All-Inclusive, Green, Zero-CO_2" electricity sales campaign, launched by Enel Energia, which guarantees the neutralization of the carbon footprint associated with the cycle of generation of the green electricity sold and of the related issuing of invoices.

Among the events and activities whose carbon footprint was neutralized in 2011, it is worth recalling Jovanotti's tour, some "Enel Points" distributed over the country and Enel's divisional conventions. All the initiatives are associated with the "CO_2 neutral" trademark that Enel registered in 2011.

Renewable energy generating mix as of Dec. 31, 2011
Total: 34,806 MW





EN6 Renewables

Renewable energy sources (RES) are one of the main strategic levers that the energy industry can and must use to curb CO_2 emissions into the atmosphere and, at the same time, cover energy demand. Their potential is growing both quantitatively and technologically. Electricity generation from renewables (RES-E) is among the key choices that Enel has made, not only to properly safeguard the environment, but also to make its generating mix more competitive. Biomass, wind, solar (photovoltaic and thermal), geothermal and hydro are the energy sources on which Enel decided to invest, becoming one of the leaders of the sector. To boost its activities of development and operation of new RES-E plants, Enel set up a dedicated company: Enel Green Power. In 2011, with a net maximum capacity of about 7,100 MW in Europe and in the American continent, Enel Green Power generated over 22 billion kWh. The company is a leader in the world, with a portfolio of technologies which is well diversified and which spans the international arena. In 2011, the company's net maximum renewable capacity was up by 800 MW thanks to the commissioning of wind farms in France, Greece, Romania, the United States, Spain and Portugal and of photovoltaic plants in Italy, Greece and the United States.

Medium-large hydro plants are managed by the companies of the Group, e.g. Enel Produzione in Italy, Endesa in Europe and Latin America and Slovenské elektrárne in Slovakia.

Today, the net maximum capacity of Enel's RES-E plants all over the world is equal to about 35,000 MW, accounting for about 36% of the overall capacity of Enel's generating mix. With this mix, Enel generated a total of about 83 billion kWh from RES in 2011, displacing over 57 million tonnes of CO_2 emissions into the atmosphere.

Among the strategies that the Group pursues in the sector of renewables, mention is to be made of:

> technological diversification - although the Group excels in historical technologies, e.g. hydro and geothermal, it is investing in more recent technologies, harnessing wind, solar and biomass resources in the various countries where it is present;

> integration into the market - the Group firmly believes in full integration of renewables into the market and thus in maintaining the existing incentives for renewables only for the strictly necessary period. The level of remuneration of incentives should take into account technological advances and the ease of access and connection to the grid should not give rise to market distortions; in this regard, it is worth pointing out that the Group's renewable-energy installations have a low dependence on governmental incentives;

> Research & Development - the Group promotes innovation by making huge investments in innovative technologies, monitoring emerging ones and developing pilot projects for those that are close to the commercial stage, with a view to identifying new high-potential technologies on which to invest.

EN5 EN6 EN7 Energy efficiency

The following are the most important initiatives, divided by type and country. Additional data can be found further on in this chapter, under the "Research & innovation" heading, and in the previous "Environmental management systems" section.

Country	Type of action	Description
		EUROPE
Ireland	Indoor lighting	Retrofitting of indoor lighting systems and installation of presence detectors in some office areas, with energy savings of 6.46 GJ and 70.9 GJ, respectively.
Italy	Power distribution grid	Installation of transformers and of new HV/MV and MV/LV substations on the grid; rationalization and optimization of the lower-voltage grid; reduction of average grid length and load, as well as of losses. Renovation of MV and LV power lines, by replacing existing conductors with other conductors of larger cross-section (over 350,000 GJ).
	Public lighting	Archilede LED system (Enel Sole): lighting system based on the Light-Emitting Diode (LED) technology, which optimizes electricity usage and lighting performance. Key features: street lighting system maximizing energy savings and providing excellent visual comfort; low environmental impact components; emission of diffuse light, with no shadows and no upward dispersion of the light flow, reducing light pollution; innovative electronics permitting flexible light intensity adjustment at the individual lighting points. In the first year, 89,000 lighting systems of this kind (saving about 23.14 GWh in total) were sold to 1,300 municipalities (including Arezzo, Vasto, Alessandria, Erba, Lodi and Treviglio).
	Hydro power generation	Renovation of the hydro plants of Sparone (2 MW) and of Bardonecchia (23.5 MW), both in the province of Turin. The new units will completely replace old ones, improving reliability, efficiency and power output (with practically the same installed capacity).
	Sales	Utilization of 100 electric cars (final customers): 58,704 kWh delivered at the power outlet, equal to 9.78 toe (about 410 GJ) saved.
	Services	Introduction of the first 34 electric vehicles into Enel's fleet. In 2011, these vehicles covered a distance of approximately 45,000 km, cutting gas oil consumption (vs. the one of a Fiat Panda) by about 2,500 l (~100 GJ). Continuing of the plan of replacement of service vehicles with Euro 5 and low-consumption models.
		Cutting of electricity usage for copiers and printers (avoiding the printing of roughly 2,400,000 pages). Decrease in the number of courier trips for document delivery (2,000 trips saved per month). Reduction of space requirements for storehouses (1).
Portugal	Thermal power generation	Monitoring of the power absorbed by auxiliaries and of the thermal efficiency of the Pego plant to detect improper consumption.
Romania	Power distribution grid	Measures to increase the energy efficiency of the overall grid: modernization of LV and MV lines; replacement of conventional conductors with twisted cables; increased cross-section of MV line conductors; modernization of satellite substations by introducing low-loss transformers; revamping of metering systems and installation of smart meters. Energy savings are estimated at about 105,548 GJ.
	Light-saving campaign	In the municipality of Izvoarele (province of Giurgiu), Enel Romania launched a campaign in 2011 to promote smart lighting practices in homes. 7,500 incandescent light bulbs were replaced with low-consumption ones. Izvoarele thus became the first Romanian municipality to use only energy-efficient bulbs. Estimated savings (with the same lighting levels) are equal to about 30 MWh (220 GJ in terms of primary energy) (2).

(1) Thanks to document digitization, the following results were achieved in 2011:
- about 800,000 documents (Enel's average: three pages/document) were not printed;
- the number of trips of couriers for document pick-up/delivery from/to the various sites and offices of Enel was reduced (the energy consumption associated with each trip could not be quantified);
- the digitization of physical archives made it possible to: i) eliminate unnecessary documents in part or move them to external premises; and ii) reduce space requirements for document storage or close document storehouses.

(2) 7,500 low-consumption bulbs x 150 hours of lighting x 50 W difference of power per bulb x 0.6 coefficient of reduction to account for non-simultaneous lighting.

Russia	Thermal power generation	In the Reftinskaya plant, works are ongoing (to be completed by 2012) to modernize unit 5; the feedwater pumps of the open-cycle cooling process were tuned up and a remote control system was put in place. In the Konakovskaya plant, the insulation of preheater tubes was replaced and the feedwater pumps of the open-cycle cooling system were tuned up. In the Sredneuralskaya plant, the feedwater pumps and the air preheaters of boiler 10 were tuned up and the lighting system was revamped by installing low-consumption lamps. In the Nevinnomysskaya plant, the operation of the most efficient units was optimized by carefully controlling load factors and the feedwater pumps were tuned up.
Slovakia	Nuclear power generation	Slovenské elektrárne completed a program to enhance the efficiency of two units (3 and 4) in its nuclear plant of Bohunice, by replacing worn components (turbines, generators, transformers, main condensers, steam separators and cooling towers). The program decreased the heat rate from 11,353 GJ/MWh in 2010 to 10,486 GJ/MWh in 2011. Energy savings achieved: 6,810,047 GJ.
	Photovoltaic power generation	Primary energy savings were obtained thanks to the photovoltaic plant supplying auxiliary power to the nuclear plant of Mochovce, which generated 860 MWh. Multiplying its output by the heat rate of thermal generation (13.111 GJ/MWh) gives total primary energy savings of 11,275 GJ.
	Hydro power generation	Primary energy savings will come from the rehabilitation of the mini-hydro plant located near the Zelene Pleso chalet, in the High Tatras national park (capacity: 1.4 kW; estimated yearly output: 9.5 MWh).
	Travel management	The personnel function worked out a procedure promoting the replacement of travel for duty with audio-videoconferencing.
Spain	Thermal power generation	Alcudia plant: optimized operation of feedwater pumps with estimated savings of 1,250 GJ.
	Research & development	Project of research on and development of advanced components allowing the future boilers of thermal plants to work at higher temperatures and pressures, with higher efficiency and lower CO_2 emissions.
	Power distribution grid	Electricity distribution in Catalonia: design of the high-voltage line of Olot-Serinyà and of the Bescanó substation (Girona) with estimated savings of 6,951.6 GJ. Electricity distribution in the Balearic Islands: installation of high-efficiency transformers, introduction of capacitor banks, increase of interconnection capacity and of cable cross-sections.
	LATIN AMERICA	
Argentina	Office training	Building of employees' awareness of the need for adopting energy-saving practices in workplaces.
Brazil	End-use energy efficiency	Coelce: under the electricity-sector legislation, distributors are required to allocate 0.25% of their revenues to energy efficiency investments. The measures taken were as follows: i) in the residential sector, replacement of old refrigerators (a new refrigerator uses up to 70% less electricity), of household appliances and of incandescent bulbs (in 2011, more than 17,000 refrigerators, 12,152 household appliances and 52,000 bulbs); ii) in the public sector, improvement of building efficiency by revamping electrical systems and introducing automatic air conditioning and lighting systems (in 2011, the efficiency of the Fórum Clóvis Beviláqua was improved). A road show was organized to raise public awareness of environmental sustainability and of wise energy use in the State of Ceará: the goal was to show explanatory models of the process of hydro power generation, subsequent electricity distribution and end uses. Estimated savings: 114,966 GJ.
	Environmental awareness & training	Thanks to energy conservation awareness initiatives, energy consumption in the premises owned by Coelce and Ampla dropped by 310 GJ and 655 GJ, respectively.
Chile	Hydro power generation	Efforts were undertaken to improve the efficiency of hydro power plants: sediment removal from basins (Rapel), cleaning of trashracks (Pangue), optimized load management (Pehuenche), replacement of the turbine (Isla), repowering of some plants (unit 5 of Rapel and unit 2 of Antucoì). Estimated savings: approximately 450,000 GJ.
		Retrofitting of 3 x 5-MW units in the Pilmaiquén plant. The project improved the utilization of water in each turbine, increasing overall capacity by about 1.8 MW and efficiency by 8%.
	Thermal power generation	Thermal plant of Atacama: energy savings thanks to production of water for industrial uses via desalination of sea water.
	Environmental awareness & training	Behavioral changes. In 2011, the internal campaign called "El Cambio Climático es una realidad, enfrentémoslo" (climate change is a reality; let's tackle it), went on. The campaign rewarded the best-performing office of Chilectra in terms of water, electricity and paper savings. Water consumption was down by 13%, electricity by 6% (1,872 GJ) and paper by 18%.

Colombia	Mobility management	An electric bike rental scheme was implemented. The resulting primary energy savings are hardly quantifiable.
Peru	Thermal and hydro power generation	Increased efficiency of the combined cycle in the Ventanilla plant and repowering of the Callahuanca hydro plant (+7.5 MW).
	Reduction of indirect energy consumption	Energy savings resulting from a few initiatives were quantified: cutting of water and paper consumption (264 GJ), travel for duty (6,052 GJ), daily commuting (7,152.84 GJ) and vehicle-fleet management (13,512.4 GJ).
	Power distribution grid	To solve the problem of overloads and respond to the growth of demand, new medium-voltage (10 kV) transformers were put in place and existing ones were repowered. These measures decreased the level of current in MV conductors and thus the losses due to the Joule effect.
	Thermal power generation	Retrofitting of gas-turbine compressors and use of low-vortex burners.
	Indoor lighting	Replacement of 5% of incandescent lamps with low-consumption ones.

In 2011, policies of efficiency improvement decreased energy consumption for simple thermal generation (-29 kcal/kWh * 123,230 GWh) and for CHP thermal generation (-20 kcal/kWh * 45,020 GWh) by a total of about 3,574 Tcal, equivalent to a total of 18,732 TJ.

Nuclear energy

The role of nuclear energy in Enel's environmental policy

Enel regards nuclear power generation as a necessary – but not sufficient – ingredient to effectively pursue its energy and environmental strategy. Therefore, it regularly monitors its nuclear plants and verifies their operational safety in order to guarantee their maximum safety.
At present, the Group has a net maximum nuclear capacity of about 5,350 MW (5.5% of its overall electrical capacity). In 2011, Enel generated about 40 TWh in nuclear plants (14% of its total generation), displacing over 36 million tonnes of CO_2 emissions into the atmosphere.
The rationale behind Enel's interest in nuclear generation is based on:

> fighting pollution and climate change;
> strategic considerations of energy independence;
> economic considerations concerning the volatility of the prices of fossil fuels, which are strongly dependent on those of oil;
> political considerations concerning the instability of the main countries which supply oil and natural gas.

Nuclear fuel (uranium) accounts for a small share of the overall generation cost; it is a resource which is geographically diversified and which generally comes from politically stable countries.
In the past few years, Enel has reacquired nuclear know-how, by relying on new resources and making targeted investments abroad.
Enel's activities in this sector are concentrated in Slovakia (Slovenské elektrárne, with 4 reactors in operation – 2 in Bohunice and 2 in Mochovce – and 2 reactors under construction in Mochovce), in Spain (Endesa, with 7 plants in operation) and in France (joint venture with EDF for construction of one European Pressurized Reactor – EPR – in the plant of Flamanville, in Normandy). The EPR is an advanced third-generation reactor, i.e. the most evolved product of the European technology, with a significant improvement in terms of capacity, safety, reliability, use of fuel, waste management processes and useful lifetime of components.
Enel pursues other international initiatives: in Romania (participation in a consortium which is looking forward to winning the contract for the doubling of the Canadian-technology Cernavodă plant) and in Russia (agreement with Rosatom for development of new plants).
In the aftermath of the incident of Fukushima (Japan) in March 2011, the EU decided to conduct stress tests, on a voluntary basis and under a set of common criteria, on all of its 143 nuclear power plants. Enel is actively cooperating

with institutions at European level and at national level in the countries where it operates, in order to plan and carry out stress tests on its in-service plants.

Nuclear safety and radioprotection

The term "nuclear safety" refers to actions undertaken to prevent nuclear incidents and minimize their consequences.
The Nuclear Safety Oversight (NSO) unit of the Nuclear Technical Area (NTA) represents Enel's interface with national and international nuclear safety bodies. The NSO is in charge of continuously monitoring and maximizing the safety performance of the Group's nuclear plants in an independent way, in line with international best practices. Ultimately, the activity of the NSO is intended to continuously improve the nuclear safety culture among the organizational units of the Nuclear Technical Area.
Radioprotection (health protection against ionizing radiation) is a discipline strongly based on biology, physics, technical and natural sciences. It developed in the 20th century, first slowly and then at an increasingly quicker pace. Its purpose is to preserve the health and well-being of workers, members of communities and the general population, reducing the health risks arising from exposure to ionizing radiation. In line with its purpose, it also deals with environmental protection (radioecology).
The Nuclear Technical Area/Radioprotection, Environment and Authorizations unit, which is responsible for laying down radioprotection requirements of nuclear plants, interfaces with the competent international and national authorities and bodies. It also carries out structured actions of monitoring, analysis and coordination of radioprotection in the Group's nuclear plants via a Radioprotection Survey Network (RSN).
From the standpoint of prevention, the two disciplines of nuclear safety and radioprotection are, in many respects, complementary: both mitigate (and aim to zero) the radiological impact on the environment and on individuals (population and workers), by relying on different strategies and approaches, e.g. probabilistic and deterministic incident analysis; best practices and operational behaviors; dissemination of fundamental knowledge and principles; specific training; and recycling of operational experience.
Upon incidents, nuclear safety seeks to pinpoint and analyze the root causes, whereas radioprotection assesses the consequent "dose commitments". Both disciplines define the event in terms of causes and effects (radiological impacts).

Proper management of nuclear plants

The operation of Enel's nuclear plants in Spain and Slovakia is in line with the international best practices of the sector. The processes defined in the guidelines of the Institute of Nuclear Power Operations (INPO), the World Association of Nuclear Operators (WANO), the Electric Power Research Institute (EPRI) and the International Atomic Energy Agency (IAEA) are a common denominator for the companies of the Group that are engaged in nuclear generation.
In the light of the best practices accepted by the nuclear industry in the world, the soundest and most effective method to guarantee high and sustainable levels of safety and environmental protection (also upon unplanned plant shut-downs) is the adoption of a model of plant operation, based on specific processes (described in detail in appropriate procedures).
Among the most important processes of the model:

- work management;
- equipment reliability;
- human performance (error prevention).

In any case, a continuous-improvement approach is taken, as described in the procedures of safety, environment and quality management systems (all the nuclear plants are certified under the ISO 9001 and 14001 standards; all the nuclear plants controlled by Enel are OHSAS 18001-certified – excluding Almaraz, Garoña and Trillo, in which the Group has no controlling stake).
Problems are detected by analyzing results. Then, solutions are studied and applied in a continuous cycle of planning, action, monitoring and control.
Thanks to this practice, all the tools used in the processes (procedures, training programs, etc.), including technical ones (software programs, simulators, etc.) are continuously updated in view of achieving operational excellence.
The key activity underlying continuous improvement is

the corrective action program. The processes set out in the program ensure that non-conformities or gaps in activities, documents, services, or conditions having a potential impact on the proper operation of the plant, on the health of the personnel, on nuclear safety or on the environment, are readily spotted and redressed.

Experience and feedback sharing is also a key activity that the nuclear industry has carried on in a structured way since the Three Mile Island incident in 1979. In the sharing process, dedicated units or teams analyze and disclose information about events (any deviation from the normally expected operation of the plant) or other operational experiences inside and outside the Company which may be of interest to Enel's plants.

This process also represents the groundwork for communication of internal events to the external world, to the benefit of the global nuclear community, through WANO's event reporting system.

Stress tests on Enel's nuclear plants

In the opinion of the European Commission, stress tests on nuclear plants are aimed at determining the safety and security margins of in-service plants upon extremely severe and concurrent events (earthquakes, floods) or incidents (loss of offsite power supply, unavailable source of water for cooling), even at very low probability of occurrence.

Thanks to new rules and better coordination, Member States will improve their common criteria for the design and operation of nuclear plants. The goal is to standardize the proposed preventive and mitigative measures in order to further increase the level of safety and security of European nuclear plants. These measures include: installation of new security/safety systems, availability of mobile equipment and portable diesel generating sets, technologies ensuring the continuity and availability of power supply in case of black-out.

In December 2011, the Nuclear Safety Authorities of Member States published their final report, laying down common criteria and including details on all the investigated plants. To make a final assessment of the ongoing process, EU authorities will await the completion of activities, scheduled in June 2012 (after cross-checks between national Nuclear Safety Authorities).

The main units of Enel involved in the process are: the Site and Plant Safety Analysis (ASI) and Nuclear Engineering (INN) units, belonging to the Nuclear Technical Area. Enel conducted a very thorough analysis of the Fukushima incident, investigating the various stages of the seismic event (and of the subsequent tsunami) and the regulatory deficiencies in terms of plant design, operation and emergency response, with a view to drawing lessons to be applied to the stress tests on the nuclear plants of the Group. The above-mentioned two units thus supported the companies of the Group in the drafting of their reports, ensuring international coordination and harmonization of the proposed mitigative measures.

Management of radioactive waste

Both in Slovakia and Spain, radioactive waste is managed by publicly-owned companies, which are paid from a special fund set aside during plant operation.

> In **Slovakia**, Javys (State-owned company) is in charge of radioactive waste and spent-fuel management and of plant decommissioning. Medium- and low-level radioactive waste (decay time: 20-30 years for low-level and 300 years for medium-level) from nuclear plants in service or under decommissioning (just as radioactive waste coming from research centers, laboratories and hospitals) is conditioned (via vitrification and other processes) and then placed into the national storage facility; this facility, located near the Mochovce plant, has been in operation since 2001. Conversely, for high-level radioactive waste (decay time: thousands of years), including spent fuel, no final geological storage site is available yet. At present, after completing its cycle, the fuel is stored for about three years in special pools (inside the plant) and then placed into a temporary storage facility at the Bohunice site. A study is under way for the creation of a final geological storage site, to become operational in about 30 years.

> In **Spain**, Enresa (State-owned company) is responsible for waste management and plant decommissioning. Medium- and low-level radioactive waste is appropriately treated and then stored in the final storage facility of El Cabril (province of Córdoba, Andalusia). High-level waste, mostly consisting of

spent fuel, is provisionally stored in pools or dry storage facilities at the sites of origin. A study on a centralized, above-ground, temporary storage facility (where high-level waste may remain for 60 years) is being conducted; this facility will adjoin a technological park, a center of excellence for nuclear research & development in the country.

In 2011, the site selection process was completed. The first four municipalities which proved to be adequate are:

> Zarra (Comunidad Valenciana);
> Ascó (Tarragona);
> Yebra (Guadalajara);
> Villar de Cañas (Cuenca).

In December 2011, the Government chose the municipality of Villar de Cañas as the place to host the centralized temporary storage facility. Temporary storage will make it possible to defer decisions about the delivery of spent fuel to a final geological storage site or about its reprocessing. In addition to the centralized storage facility, it was decided to build a temporary storage facility adjoining each plant, so as to continue to temporarily store the fuel on site when approaching the level of saturation of the fuel pools. The plants which will build the temporary storage facility will be Ascó and Santa Maria de Garoña. The on-site temporary storage facilities will be based on different technologies. For instance, at the Ascó site, construction of an on-site temporary dry storage facility began in 2011. The facility will be ready to accommodate the fuel in May 2012. As regards Almaraz, Vandellós and Cofrentes (plants in which Enel has no holdings), the period expected for saturation of the spent fuel pool goes beyond 2020; therefore, no on-site temporary storage facility will be needed. Nevertheless, the Spanish Nuclear Safety Council (CSN) is considering the possibility of establishing a time limit for storage of spent fuel in the pools, in the light of the Fukushima incident. The possible decision might change the time schedule of construction of the storage facilities.

Anyway, all the activities of waste management are based on quality criteria and standards, in line with the best practices of the sector, thereby safeguarding the environment, communities and future generations.

Optimizing performance

In-service power plants undergo programs of upgrading and repowering.

> In Slovakia, Slovenské elektrárne's nuclear share of total electricity generation has grown in the past few years thanks to the adoption of the most advanced technologies, which increased the generation of units 1 and 2 of the Mochovce plant and of the two units of the Bohunice plant.
> In Spain, projects of modernization, with major environmental performance improvements, are also under way. By agreement with Enresa, all Spanish nuclear power plants are involved in programs of reduction of radioactive waste production.

Training and research

Enel is already active in the following areas:

> **specialist on-the-job training**: about 60 of Enel's engineers, to be charged with tasks of engineering, construction and operation in connection with the Flamanville 3 project, are being full-time trained by EDF in its sites dedicated to the project;
> **research strategy**: the Group is using its available specific resources in an integrated way, in particular by coordinating the dialogue between the Spanish and Slovak teams, with a view to restoring a sound body of knowledge in this sector.

Furthermore, in 2011, Enel kept the vice chair of the Sustainable Nuclear Energy Technology Platform (SNE-TP) Governing Board, actively participating in its international activities.

To know more about the activities carried out in 2011 in the nuclear sector, the reader is referred to the sections of the Report concerning Slovakia and Spain.

Gas exploration & extraction (Upstream Gas)

The Upstream Gas function has the task of contributing to the coverage of the Group's overall long-term gas requirements (over 30 billion m^3/year) through its own share of gas production. Activities are presently focused on: development of the Group's portfolio of projects, in order to progressively start production from 2012 on; and search for new medium-long term opportunities for procuring gas for local markets (Russia, Italy and Latin America), via pipelines (Algeria) or supplies of liquefied natural gas (LNG).

In 2011, Enel mostly participated in projects which were operationally implemented by other global gas exploration & production operators, including Total, Repsol, Eni, Novatek and Petroceltic, with holdings ranging from 10% to about 19%. Furthermore, Enel directly managed operational activities under exploration leases in Italy; however, these activities do not yet involve drilling, construction or production.

The most advanced projects in which Enel is involved are as follows:

Algeria – South-East Illizi project: in 2011, under its work program, Repsol collected seismic data (in preparation for identifying the gas field and the location of exploratory wells) for a total of about 840 km of seismic lines.

Algeria – Isarene project: Petroceltic drilled 5 wells and carried out subsequent production tests. At the same time, it collected geological data on the gas field to integrate those acquired during its previous exploration, with a view to drafting the "Field Discovery Report" to be submitted to the Algerian company Sonatrach.

Russian Federation – SeverEnergia project (operational joint venture including Enel, Eni, Gazpromneft and Novatek): the joint venture completed the drilling of 4 wells, built gas treatment systems, gas and condensate pipelines and other installations (with a view to beginning production expectedly in 2012) and carried out exploration and appraisal activities.

Enel makes sure that the joint ventures in which it takes part comply with its environmental and safety policies. Indeed, workers' safety & health and environmental protection are key targets not only of the activities of Enel, but also of those of its partners, which are selected, among others, on the basis of their possession of the ISO 14001 certification.

In Algeria, Enel held periodical meetings with Petroceltic and closely monitored the environmental and safety performance of its activities, with full satisfaction for the results achieved and the procedures and standards adopted. The status of the drilling sites was periodically documented by photos and videos, in order to better schedule environmental restoration at the end of works. As regards waste management, about 190 m^3 of plastics (mostly bottles) and aluminum were compacted and carried to the Hassi Messaoud operational headquarters in order to be recycled together with 6 containers of waste metal. As to liquid releases, approximately 18,000 l of oily water from the production process were delivered to treatment operators, whereas other non-polluted liquid releases are usually treated on site in vaporization tanks. The residue is then collected and delivered to disposal sites.

Always in Algeria, as part of the SEI project, Enel held periodical meetings with Repsol in order to monitor the HSE aspects of its operations. Enel received evidence that Repsol adopted a system to separate all the waste items produced during operations (organic, dry or biodegradable) and to transfer them to disposal sites near In Amenas or Hassi Messaoud in accordance with special waste disposal contracts. Other liquid waste items (sewage or process water) were managed via separate collection and treatment. Regular inspections ensured compliance of the local system with Enel's model.

Research & innovation

Innovation plays a fundamental role in the global scenario, which is confronted with: on one hand, the fight against climate change and the achievement of CO_2 emission reduction targets; and, on the other hand, the coverage of the rising energy demand of a modern developing society. Secure, efficient and sustainable energy supply may help effectively respond to these targets. This is why the main decarbonization scenarios see a growing role of electricity in the long-term energy mix. The new model is based on strong growth and integration of renewables, energy efficiency and new end uses of electricity (smart energy management), including electric mobility and deployment of conventional technologies for flexible, efficient and low-CO_2 electricity generation. In this area, the Group pays the utmost attention to technological progress and is strongly engaged in innovative research and technological improvements.

The research & innovation activities of Enel are conducted within the framework of its technological innovation plan, whose purpose is to enhance the competitiveness and strengthen the technological and environmental leadership of the Group.

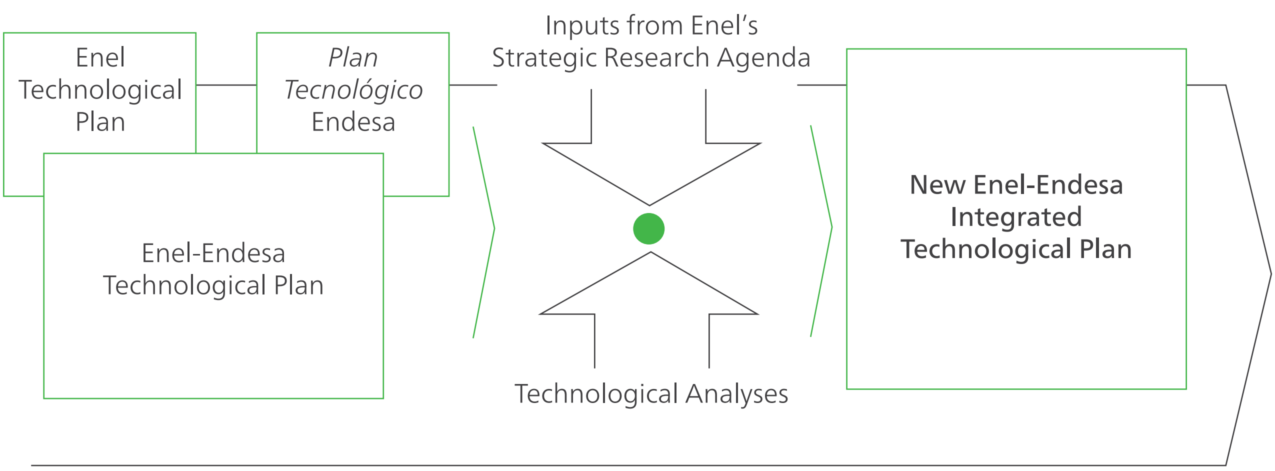
The following are the main projects in which Enel is currently engaged, as well as the results achieved and the progress made.

Carbon capture & storage (CCS)

In Europe, Enel is at the forefront of the study and demonstration of all CCS technologies, with a broad spectrum of activities, from the capture of carbon from the flue gases of coal-fired plants (post-combustion capture) to innovative fossil-fuel oxy-combustion and gasification (pre-combustion capture) and to solutions for geological storage of CO_2.
The following paragraphs outline the main activities that the Group carries out in the various technological areas.

Post-combustion carbon capture

In 2010, Enel completed the construction of a carbon capture pilot facility, integrated into its Federico II plant (Brindisi). The facility was inaugurated on March 1, 2011 in the presence of the European Energy Commissioner. The facility, one of the first of its size in Europe and the world, can treat 10,000 Nm^3/h of flue gases (corresponding to approximately 3.5 MWe) and separate 60 t/day of CO_2. It will help optimize the capture process, test innovative sorbents and strengthen Enel's know-how in this field, in view of the construction of an industrial-scale demonstration facility.
In Spain, in the Compostilla plant, Enel put into operation a 300 kW_{th} pilot facility for amine-based post-combustion carbon capture. Activities in this facility are conducted



in synergy with those of Brindisi and aimed at the pre-qualification of processes and solvents that are under development.

In the La Pereda plant (near Mieres, Asturias), Enel is developing a 1.5 MW_{th} installation to test the calcium carbonate looping technology. Calcium looping is one of the innovative techniques to capture CO_2. It exploits the carbonation reaction of a calcium-oxide sorbent to separate carbon dioxide from burnt gases; the resulting calcium carbonate is then regenerated, providing heat via coal oxy-combustion. The process has a low energy consumption because most of the heat needed to regenerate the sorbent can be recovered. One of the drawbacks of the process, to be investigated further, is the loss of effectiveness of the sorbent during its absorption and regeneration cycles.

Oxy-combustion

The technology of CCS with combustion in oxygen at atmospheric pressure is mainly developed in Spain with the demonstration project of Compostilla.

The 30 MW_{th} pilot facility, completed at the end of 2011, will subsequently begin its experimental operation. Always in the area of oxy-combustion, Enel's efforts in Italy are geared to developing an innovative process of combustion in pressurized oxygen. This activity is conducted in synergy with ITEA, a company of the Sofinter Group.

Pre-combustion carbon capture

Pre-combustion carbon capture relies on fossil-fuel gasification technologies. Enel concentrated its efforts on systems to generate electricity from hydrogen, a product of the CO_2 separation process. In 2011, the hydrogen-fired 16 MW_e plant of Fusina (Venice) operated for over 1,000 hours. The next stages will include the fine-tuning and testing of a new burner manufactured jointly with GE, with the goal of curbing NO_X emissions to below 100 mg/Nm^3.

Research into coal gasification will be developed also by participating in the Elcogas plant project (Puertollano, Spain). In 2011, a process of separation of syngas in CO_2 and hydrogen was experimented in this plant, with promising results in terms of overall carbon capture costs.

Carbon sequestration

After characterizing and preliminarily selecting sites suitable for permanent geological storage of CO_2, Enel began studies on its use in bio-chemical processes.

As regards research into biological (algal-based) capture of CO_2 and development of the biorefinery concept, Enel has already built a pilot installation with 500 m^2 of photo-bioreactors at the site of its coal-fired plant of Litoral Almería (Andalusia).

Systems to enhance energy efficiency and hold down emissions

In this area, the main project (European Network for Component Integration and Optimization - ENCIO) is intended to build a pilot facility at the Fusina (Venice) plant site for testing innovative materials. These materials, capable of withstanding temperatures and pressure well above current ones (700°C at a pressure of 365 bar), are expected to be used in future coal-fired plants with an efficiency of 50%. Thanks to higher efficiency, these plants will emit about 15% less carbon dioxide than the most modern plants now in service.

Furthermore, Enel also continued efforts to develop technologies for holding down polluting emissions and analyzing emission sources. Thanks to the long-standing experience of its research teams in this area, Enel reached levels of excellence in emission abatement.

Sensible Plant, Zero-Accident Plant, Cybersecurity

Enel's research teams are analyzing the actual performance and potential development of advanced sensing, diagnostic and automated systems for power plants, so as to enhance their reliability, safety/security and efficiency and to minimize accidents during their construction, maintenance and normal operation.

Electricity generation from renewables

Enel is investigating all the main technologies of electricity generation from renewables, in order to identify and use those permitting to produce electricity at the least cost in each of its sites.
Research activities range from field tests of commercially available solutions to development of innovative technologies, design and application of advanced diagnostic systems to monitor the performance and optimize the maintenance of installations, development of systems to predict the generation of wind, solar and hydro plants under various weather conditions.
The following are the main activities conducted in 2011 and their results.

Solar thermodynamics

The medium-long term development of concentrating solar plants is being increasingly centered on the use of molten salts to collect radiation and store energy. The Archimedes pilot plant (Priolo Gargallo, Syracuse) is the first example in the world of a parabolic-trough facility using molten salts to collect solar radiation and store energy. This experience set the pathway for construction of solar thermodynamic plants in the near future. Thanks to technological breakthroughs in key components and types of salts, to be field-tested, the electricity generated in solar thermodynamic plants will reach grid parity. Enel is also investigating technologies which may reach commercial maturity in the medium-long term, such as direct steam-generating systems or Stirling systems.
The main activities under way are described in the following two subparagraphs.

Archimedes

The first stage of operational tests was completed, confirming performance levels close to design ones, with heating of the salts to 540°C and steam generation at temperatures exceeding 520°C. The plant control system is being optimized in view of building large-sized industrial plants. A circuit for testing salts at low melting temperatures (80-140°C) and innovative components is being installed.
The European Commission decided to fund the ARCHETYPE project, coordinated by Enel Green Power, which involves the construction of a solar thermodynamic plant (30 MW) near Catania. The project will be the first industrial application of the Archimedes technology. The solar plant will be equipped with an innovative desalinator, thus operating in CHP mode. Additionally, to optimize performance, the plant will use biomass of plant origin (in place of fossil fuel) for the necessary integration.

Geothermal-solar thermodynamic integration

Enel initiated the preliminary design of a solar thermodynamic plant to be integrated into the geothermal plant of Stillwater (Nevada, USA). The plant will tap the synergies between the geothermal source and the solar one, maximizing the economic return of power generation.

Innovative photovoltaics

The main photovoltaic research activities are concentrated at the solar laboratory of Catania. In 2011, the laboratory gained the CEI EN 61215 and 61646 accreditation for testing the performance of silicon and thin-film PV modules. The laboratory characterized all the main PV technologies available in the market – both in the laboratory and in the field – and validated models capable of predicting PV component performance under various operating conditions. A system for diagnostics, maintenance optimization and forecasting, developed by Enel's Research, is now being installed in all the plants of Enel Green Power.
Moreover, a joint venture between Enel Green Power, STMicroelectronics and Sharp (3SUN) initiated a project of research and testing of new materials and integration of advanced electronic components.

Distributed generation

Enel completed the design and engineering stages of a system to generate on-site electricity from renewables and thus serve remote areas not connected to the power grid. The system (whose design was internationally patented by Enel) integrates PV modules and storage systems and can supply electricity to the local population (rooms used for training & education, outpatients' clinic with refrigerator for drug storage, water purification, mobile phone recharging, PCs with Internet connection). The first prototype will be installed in January 2012 at the site of Enel's Research in Pisa.

Diamond

In 2011, a memorandum of understanding was signed between Roma Capitale, Enel SpA and the University of Rome "La Sapienza" for the installation of a "Diamond" solar PV facility near the Valle Giulia site of the School of Architecture of the same University. The facility, which combines PV panels with storage systems in a diamond-shaped futuristic structure (one is already in service in the natural park of Pratolino, Florence), will be installed in Rome in the course of 2012.

Innovative geothermal energy

Enel is engaged in the study of a high-performance supercritical organic cycle which will make it possible to build more efficient plants using low-enthalpy geothermal sources. In its Livorno test site, Enel is conducting experimental work in view of building a 500 kW_e pilot system in partnership with Turboden (Italian manufacturer of turbogenerators based on the Rankine Organic Cycle) and the Milan Politecnico.

New catalysts to abate emissions from geothermal plants were also developed and pilot-scale tested.

Wind energy

Enel completed the installation of short-term generation-prediction systems, developed by Enel's Research, in all of its Italian wind farms. The reliability of these systems is superior to the one of commercially available solutions.

Furthermore, Enel began the development of an advanced diagnostic and predictive system to optimize the performance and maintenance of all of Enel Green Power's wind farms.

Sea or ocean energy

Technologies to generate electricity from sea or ocean energy have not yet reached the technological maturity and cost levels needed to ensure the price competitiveness of the generated electricity. This is why Enel completed a first stage of analysis and selection of the most interesting sites in terms of availability of natural resources in Europe and Chile. It also carried out an activity of scouting for the most promising technologies among those under development.

Energy storage

Energy storage is crucial to managing power grids with a high number of discontinuous and intermittent renewable-energy systems while meeting quality and safety/security standards. End-use energy storage systems may optimize electricity consumption and withdrawal from the grid, enabling customers/producers to minimize their generation costs and provide remunerated services to the power grid. On the other hand, the power grid will benefit from active demand management in terms of load stability and schedulability.

Enel's Research is monitoring and developing technological solutions – both commercially available and under development – so as to understand their actual performance and their potential to support the overall power system.

In 2011, Enel completed analyses on the performance of the first three systems installed at its Livorno test site (vanadium, lithium ions and ZEBRA batteries) and conducted the first technical-economic feasibility analyses on storage systems coupled with wind farms or low-enthalpy geothermal plants, with a view to optimizing their economic returns. Furthermore, Enel installed the first Italian electric vehicle fast-recharging post at the Livorno test site, in order to assess the effects of fast recharging on the life of batteries and to determine the most appropriate ways to connect the recharging posts and storage systems to the power grid. Finally, Enel put in place a cutting-edge hydrogen storage system – a possible candidate for medium-long term energy storage.

In Spain, under the STORE program, researchers from the Enel Group and Endesa are working to demonstrate the use of storage systems integrated into grids with a high density of renewable-energy systems in the Canary Islands.

Energy efficiency

Smart grids: energy efficiency combined with distributed generation

Areas of interest are:

> integration and smart management of distributed energy resources;

> technological evolution (energy efficiency, use of electricity as a carrier);

> standards and infrastructures (interoperability, security and privacy);

> customer empowerment.

Enel embarked on the Isernia project, involving a number of technologies and services which can already support smart grids. These technologies span from new products, to be installed in substations for voltage control and automatic fault detection, to innovative communication systems between network nodes, storage systems and devices permitting the activation of energy efficiency services in households.

In 2011, Enel went on with its activities as part of the European ADDRESS project, of which Enel Distribuzione is the leader and coordinator. The project will shape a new business model promoting an active role of the final customer.

Enel's device to activate the above range of services in households is called Smart Info. Thanks to Smart Info, customers have access to the data managed by smart meters and thus to energy efficiency services. A first example of this potential is the Energy@home project, conducted jointly with Telecom Italia, Indesit and Electrolux. The project led to the development of a data communication platform where new generation household appliances contribute to energy efficiency services.

On the energy efficiency front, Enel went on with the development of the "Malaga Smart City" project. The year 2011 saw the installation of the near totality of the planned systems (about 6,600 smart meters, power line communication – PLC – network and MV/LV grid automation, public lighting based on LED/halogen technologies, remote customer relationship management, electric vehicle recharging posts, integration of distributed generation and storage systems, energy efficiency monitoring in representative buildings). The demonstration stage of the project will end in 2012.

As part of the "Casa Enel" (Enel Home) project, aimed at developing value added services for efficient household energy management, Enel Energia began the trial of a customer awareness improvement system involving 1,800 customers. The project includes, among others, the provision of beyond-the-meter services enabling customers to monitor and control their overall energy consumption. As regards energy efficiency enhancements in the service sector, a system was designed and partially built to monitor the premises of Enel's Research and the National Enterprise for nanoScience and nanoTechnology Laboratory (NEST) of the Scuola Normale Superiore in Pisa.

Power-driven mobility

Enel's projects of deployment of power-driven mobility continued in 2001 and were extended to additional sectors.

As part of its "e-mobility Italy" project, developed in partnership with Daimler Mercedes, Enel continued to phase in public and private recharging systems for the first 100 customers who rented Smart Electric Drive cars in Rome, Milan and Pisa.

As regards agreements with manufacturers, Enel intensified its cooperation with the main players of the sector in view of providing final customers with integrated offerings.

In Spain, activities of development of electric mobility continued – both commercially and infrastructurally – maximizing the synergies available within the Group. The first installations of fast charging systems, for instance those integrated into the "Malaga Smart City" project, are part of this development.

Among sustainable mobility initiatives, the Green Ports project is aimed at offering a line of integrated services reducing emissions in port areas.

In particular, in the course of 2011, Enel delivered the preliminary design for electrification of the Marittima basin to the Venice Port Authority.

The Venice agreement adds to the one signed with the Civitavecchia Port Authority (Italy), for which Enel has completed the project of electrification of one pier of the port to supply electricity to cruise ships, and to those signed with the Port Authorities of La Spezia and Barcelona. The Green Ports theme is also part of the "smart cities" projects, under the agreements that Enel Distribuzione is concluding with the cities and Port Authorities of Genoa and Bari.

EN26 Management of water resources

The management of locally-available water resources is central to biodiversity conservation, as well as to societal development and well-being. High rates of water consumption with respect to local natural flows may cause water stress.

Enel constantly monitors all of its production sites in areas at risk of water scarcity, so as to manage water resources in the most efficient way. Actions are carried out at different levels:

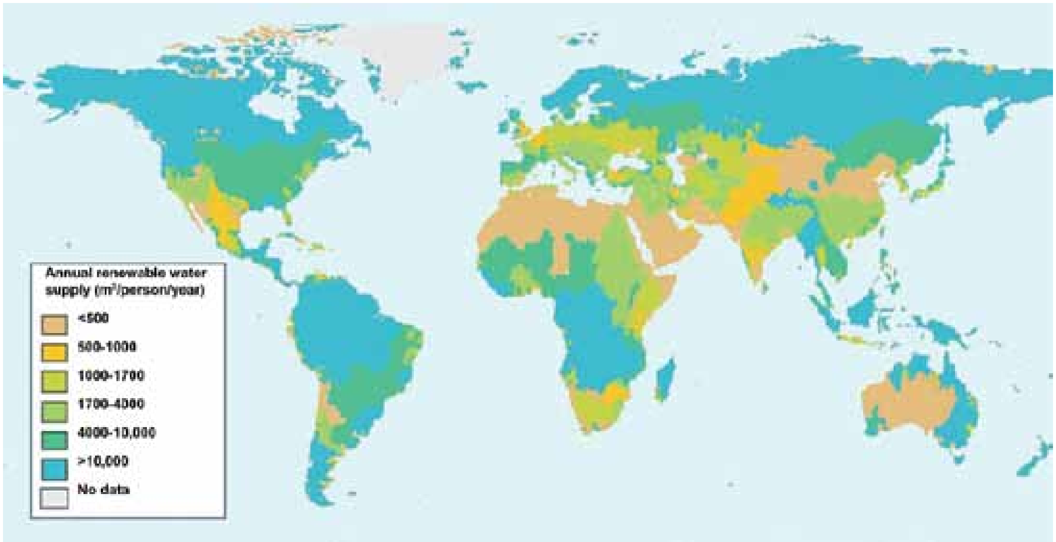
> mapping of areas of potential water scarcity: if the countries involved have an average value of renewable water resources per person lower than FAO's reference value, use is made, among others, of specific software programs (e.g. the one developed by the World Business Council for Sustainable Development) to identify possible production sites located in these areas;

> identification of "critical" production sites, i.e. using freshwater;

> more efficient management, thanks to retrofits of plant systems or processes aimed, among others, at maximizing the use of liquid releases and sea water;

> monitoring of climate and vegetation data in each site.

The above analyses showed that only the steam-cycle and combined-cycle plants of Costanera (Argentina), the Foix plant (Spain) and the Malacas plant (Peru) exploit freshwater resources in areas at risk of drought.



Nevertheless, it is worth pointing out that:

> the power plants of Costanera abstract water from Rio de la Plata, which has high discharge values throughout the year; water consumption by these plants is limited and may be regarded as negligible in terms of impact on the region's water stress;

> the plant of Foix abstracts water from five freshwater basins located many kilometers off the coast; this water is only used to cover demand peaks. In 2011, the plant did not operate; therefore, its water consumption may be considered negligible;

> the plant of Malacas abstracts water almost exclusively from aqueducts to cover its industrial uses (very limited). The closed-cycle cooling system, replenished every four years, consumes a negligible amount of water.

Biodiversity conservation

Biodiversity conservation is one of the strategic targets of Enel's environmental policy.

The Group promotes a number of projects in Italy and abroad to support the conservation of ecosystems and natural habitats in the areas where it is present, not only as an industrial operator but as an active player of the local, social, cultural and environmental life.

Enel's efforts in this field regard both installations and their areas of influence and consist of actions of different type: monitoring surveys, projects of conservation, research and improvement, offsets or corrective measures and socio-environmental studies.

EN12 EN14 The Group's biodiversity strategies, actions and specific plans of action are mostly voluntary or based on agreements made during processes of authorization for construction of installations; in no case are these activities prescribed by national legislation or regulations.

Enel feels that any action on ecosystems must be based on a thorough knowledge of the equilibria of the areas where it operates. Enel monitored each of its installations located near international, national or local protected areas, identifying the rationale behind their conservation, their high-value ecosystems, their threatened biotopes, animal or plant species to be conserved and assessing its impacts thereon. Enel's activities are thus carried out in full respect of the natural environment and of biodiversity. Thanks to its knowledge of the species present in these areas, Enel can determine those included in the IUCN (International Union for Conservation of Nature and Natural Resources) Red List of Threatened Species, their level of risk and thus the measures to be taken for their conservation.

The data on the protected areas where the Group carries out its activities and of the species included in the Red List are available at http://www.enel.com/it-IT/sustainability/environment/biodiversity/ and http://www.enel.com/en-GB/sustainability/environment/biodiversity/.

EN9 EN11 EN25 The website pages indicated above also provide detailed data on: location of protected areas and streams; streams from which water is withdrawn for hydro power generation and cooling (whatever the volumes of withdrawal); water releases exceeding 5% of the yearly average discharge of the stream or of the impoundment storage volume.

From the standpoint of active management of biodiversity, Enel carries out prior impact studies, systematically evaluating effects on biodiversity and, where necessary, adopting offsets or improvements to the original situation. In the environmental impact study, Enel takes into consideration the protection of ecosystems and of animals' or birds' migratory flows, identifying the best options in terms of structure, materials and components to be used. For grids, Enel also takes into account the geometry of supports and is progressively adopting insulated cables, which have a lower impact on landscape and fauna.

In many sites, by agreement with local institutions, independent third parties conduct land-, river- and sea-based biomonitoring surveys to determine the impact of the activities of Enel on biodiversity and the adequacy of its offsets or enhancements. At a later stage, an environmental management system under the ISO 14001 standard is put in place, by applying the Group's environmental policy and periodically evaluating impacts on biodiversity. Subsequently, risks (including the risk of impact on biodiversity) are analyzed. Finally, personnel members are made aware of the possible risk of impact, of the measures needed to mitigate it and of the Group's commitment to biodiversity.

So far, all the monitoring surveys have showed no negative impact on biodiversity and the adequacy of the measures taken to avoid the negative effects of emissions into the atmosphere, warm liquid releases, noise and maintenance of distribution line corridors. Ecosystems always have a good conservation status and are often actively monitored by the companies of the Group under agreements with international, national and local bodies and organizations. Operational precautions include: reduction of water abstraction and releases; avoidance of impacts on the fish fauna; and mitigation of noise from equipment. Releasing the minimum in-stream flow makes the discharge of ephemeral streams, downstream of dams, more constant than the natural one, preventing their drying up. Indeed, regular water flows represent an unquestionable environmental enhancement, as they preserve the biodiversity of aquatic ecosystems. Basins also act as minor wetlands favoring the migration of avian fauna.

The following table displays the biodiversity projects initiated or fully implemented in 2011 and those continued or completed in the same year. Institutional stakeholders (agencies, associations, foundations, study centers, universities, etc.) are involved in the projects. Data on the activities are disseminated through specific publications (Environmental Report, Annual Report, Sustainability Report, EMAS environmental declarations, flyers) or posted at http://www.enel.com/it-IT/sustainability/environment/biodiversity and http://www.enel.com/en-GB/sustainability/environment/biodiversity/.

IUCN risk of extinction

Extinct		Threatened			At lower risk		
EX	EW	CR	EN	VU	CD	NT	LC

For each project, the following data are generally reported: location/name, content (referring to the species shown in the first column, unless otherwise specified) and, between brackets, the project coordinator/s.

Enel's projects of biodiversity conservation

Europa

Bulgaria	*Project*	*KPI GRI*
Griffon Vulture (*Gyps fulvus*) LC	Central Balkan national park: as part of the project of reintroduction of the species, after the first 40 raptors from Spain were relocated to the park in 2009 and an acclimation aviary was put in place, efforts continue to favor feeding and reproduction. [Enel and Bulgarian Society for the Protection of Birds].	**EU13**

France	*Project*	*KPI GRI*
Montagu's Harrier (*Circus pygargus*) LC	Barrois area - Site of Community Importance for Bird Conservation: measures are taken to promote the nesting and feeding of Montagu's harriers in the wind farm area (roughly 20 ha). In particular, the land surface is maintained by alternating rows of crops with rows of grass cover, so as to induce prey reproduction (micromammals, orthopterans and nesting birds). The project is implemented jointly with: local farmers, who refrain from fighting rodents and using pesticides; and the permanent center for environmental initiatives (CPIE), the hunters of the Aube department, the avian protection league (LPO), the Montagu's harrier study and protection group (GEPB) and the Ardenne region, which carry out monitoring activities. Findings from these activities confirm that active protection of the nests of Montagu's harriers is needed, especially during hay harvesting, to favor their reproduction. [Enel Green Power].	**EN13**
Wetland ecosystems	Loire springs - natural zone of ecological, faunal and floral interest and Natura 2000 site: the zone is being monitored to assess the effect of the wind farm on: pre- and post-breeding migration of avian species (project duration: three years); migration, wintering and nesting of raptors (project duration: two years); and bat activity (project duration: two years). [Enel Green Power].	**EN13**

Italy	*Project*	*KPI GRI*
White Stork (*Ciconia ciconia*) LC	Cilento and Vallo di Diano national park (Sala Consilina, province of Salerno): improvement of storks' staging areas, also in view of educational-scientific activities. [Enel jointly with LIPU and WWF].	**EN13**
Griffon Vulture (*Gyps fulvus*) LC	Sardinia: study and monitoring of the species and of its habitat in the area surrounding the town of Bosa (Nuoro); attention to threats to its survival; awareness actions in schools and among local communities; creation of sighting points and of a nature trail. [Enel jointly with Legambiente].	**EN13, EN15**
European Otter (*Lutra lutra*) NT	Upper Volturno river valley: habitat monitoring and protection; population estimates; demarcation of home ranges to be protected; creation of sighting points and educational signs. [Enel jointly with the Pianeta Terra association].	**EN13**

Italy	Project	KPI GRI
Northern Pike (*Esox lucius*) LC	La Casella thermal plant: yearly restocking of the Po river with 1,500 juveniles, as specified in the relevant water abstraction permit. [Enel Produzione].	EU13
Loggerhead Sea Turtle (*Caretta caretta*) EN	Sea turtle rescue center of Brancaleone (Reggio Calabria): development of the center, which deals with rehabilitation and care of injured animals, conducts awareness & education actions and updates the relevant national database. [Enel jointly with CTS, owner].	EN13
	Sea turtle rescue centers of the lake Salso sanctuary (Foggia) and of the Rauccio forest (Lecce): support to the centers, study of habitats suitable for egg laying and youth awareness actions in local schools. [Enel jointly with Legambiente].	EN13
Red Kite (*Milvus milvus*) NT	Mount Amiata area (Mount Amiata, Mount Penna and upper Albegna river valley) - southern Tuscany (Grosseto) - and Gola della Rossa and Frasassi regional natural park - Marche (Ancona): the main purpose of the project is to complete the reintroduction of red kites, already started in the upper Albegna river valley and in the Frasassi park. The project consists of: relocating young red kites from other European countries, e.g. France (Corsica) and Switzerland; taking safety measures on over 40 km of power lines; installing more than 1,200 protective devices on pole heads; replacing conductors with insulated cables; and installing trapezoidal platforms where birds can roost away from conductors. In 2011, about 18 km of power lines were insulated. Other efforts include: satellite and VHF tracking of the released red kites; video surveillance of feeding platforms; and large-scale awareness campaigns (publication and distribution of informative material, preparation of an educational trail on the theme of bat protection, two dedicated rooms in the Mount Amiata wildlife park and in the Frasassi park, lectures in schools). A website shows real-time web-cam images of the systems of video surveillance of a colony of troglophile bats and of two feeding platforms used by red kites; the website will also post maps of the movements of red kites fitted with satellite radio transmitters. [Amiata Mountain Community of the Grosseto area, Esino Frasassi Mountain Community and Enel Distribuzione].	EN14
Eel, trout, trout juveniles, cyprinids (various species including those at risk, e.g. Marble Trout – *Salmo trutta marmoratus*) and salmonids LC	Various sites: restocking using various species of local fishes. [Enel Produzione and Enel Green Power].	EN14
Mediterranean Tapeweed (*Posidonia oceanica*) LC	Torrevaldaliga Nord thermal plant: sea-based monitoring of benthic components and of physico-chemical features of the water; monitoring of a Mediterranean tapeweed prairie (1 ha) planted in previous years; extension of the protected area of the Site of Community Importance to 435 ha. [Enel Produzione].	EU13
Stream ecosystem	Hydro plants: determination of optimum minimum in-stream flows under an experimental program taking into account the hydromorphological and environmental features of local streams and conducted by agreement with the relevant authorities; stream monitoring every six months. [Enel Produzione and Enel Green Power].	EN14
Ecosystem	Thermal plants: in 2011, Enel continued its environmental rehabilitation and restoration of contaminated sites in industrial areas considered to be at high industrial risk. These sites are designated as of "national interest" by Law 426/1998 and subject to the technical rules laid down in Legislative Decree 152/2006. In particular, as regards thermal plants, Enel: approved the characterization plan for the Giugliano plant; planned rehabilitation and safety measures for the Assemini plant; continued emergency groundwater safety and conservation measures in the Piombino and Maddaloni plant areas (adding to those already completed in the La Spezia, Porto Marghera, Sulcis, Livorno and Porto Scuso plant areas in previous years); completed the final design of environmental rehabilitation and restoration works in the areas of the Piombino, Brindisi and La Spezia plants and in some areas of the Sulcis and Portoscuso plants, taking into account – among others – the additions requested by the Environment Ministry. In previous years, Enel had already carried out similar activities in the Fusina, Porto Marghera and Livorno plant areas. Additionally, Enel: went on with its program of environmental rehabilitation of the Priolo Gargallo plant area; completed environmental rehabilitation activities in the Augusta plant area and is awaiting the related certificate of completion. [Enel Produzione]	EU13
Flora, fauna, ecosystem and landscape	Thermal plant of Pietrafitta: the methodology used to mitigate the visual impact of the plant is part of the project of revegetation of about 330 ha in total (including about 10 ha corresponding to the former coal bunker area, whose greening was completed in 2011). Moreover, Enel continues to maintain the row of tall trees previously planted to create a barrier for visual impact mitigation. Every year, the provincial administration of Perugia conducts a survey of bird populations in the protected area. [Enel Produzione].	EN13
	San Francesco forest (Assisi, province of Perugia): in a 60-ha forested area, Enel contributes to restoration and conservation schemes, by surveying and cataloguing significant botanical species, cleaning the underwood and conservatively pruning trees and shrubs. [Enel SpA].	EN13

Italy	Project	KPI GRI
Flora, freshwater and wetland ecosystems	Santa Barbara thermal plant: air quality biomonitoring surveys via passive sensors (lichens); periodical surveys to measure algal concentration and composition, the Extended Biotic Index and some chemical parameters along the San Cipriano stream. The results of the surveys are forwarded to the local environmental agency (ARPAT) and authorities. [Enel Produzione].	**EN14**
Marine, freshwater and wetland ecosystems	Porto Corsini plant (Ravenna): monitoring survey of the Pialassa Baiona lagoon, covering a surface area of 1,100 ha. At the end of the reporting period, results were good. [Enel Produzione].	**EN14**
	Priolo Gargallo plant: agreement with the managed nature reserve of the Priolo salt flats (RNO Saline di Priolo) to conserve the wetland. [Enel Produzione].	**EN13**
	Pietrafitta thermal plant: monitoring of the trophic state of the storage basin water with the methodologies used for developing the register of environmental aspects of the ISO 14001 environmental management system. Enel goes on with its program of environmental restoration of the protected area and cultivation of previously restored areas. Monitoring processes include: determination of emissions of pollutants into the atmosphere, sampling and analysis of waste waters and monitoring of groundwater. [Enel Produzione].	**EN14**
	Brindisi thermal plant: the province of Brindisi periodically monitors the water body facing the plant. The surveys are based on prior bathymetric and geomorphological characterization and subsequent collection of biological samples for biomarker analysis and of sediment samples to determine grain size, carry out toxicity tests and characterize the planktonic component. Finally, the data are processed with Beyond-BACI (Before and After Control Impact) procedures in order to quantify anthropogenic effects. [Enel Produzione].	**EN14**

Portugal	Project	KPI GRI
Avian fauna and bats	In all wind farm sites, collisions of avian fauna and bats are continuously monitored. [Enel Green Power].	**EN14**
Iberian Wolf (*Canis lupus signatus*) VU	Agreement with local institutions for conservation of the Iberian wolf. Enel participates in a fund which was created to finance programs of: reforestation of farmland with autochthonous species; maintenance of forested areas; higher availability of food and shelters for prey; promotion and improvement of prey diversity and availability; reduction of disturbance to Iberian wolves by introducing banned-hunting areas. [Enel Green Power and ACHLI - association for conservation of the Iberian wolf habitat].	**EN13**

Romania	Project	KPI GRI
White Stork (*Ciconia ciconia*) LC	Mounting of 162 circular platforms on power line towers to favor nesting. [Enel Distributie Dobrogea and Enel Distributie Banat].	**EN14**
Saker Falcon (*Falco cherrug*) VU	This species of falcon has a tendency to nest on high-voltage power line supports. Enel took part in the conservation of this raptor by installing GPS devices. The first joint action involved the application of identity rings to three young individuals of this vulnerable species which is nesting in the country. Moreover, for the first time in Romania, one of the three young raptors was equipped with a latest-generation GPS locator, which records data on their daily movements and transmit them to specialists for subsequent analyses. The results of these analyses will help protect this species and improve the understanding of its migratory routes. The application of the tracking system involved an entire crew of Enel, as the nest was placed on a high-voltage power line tower managed by Enel Distributie Banat in the Torontalului plain (county of Timis). [Milvus Association and Enel Distributie Banat].	**EN14**

Russia	Project	KPI GRI
Fish fauna	The feedwater pumps of the open-cycle cooling system may disturb fishes in the Ivankovskoe basin (Konakovskaya plant - KGRES - site) and in the Barsuchkovsky canal (Nevinnomisskaya plant - NGRES - site). Particular emphasis is placed on mitigation of this impact. Consequently, fish screens are being installed near the pumping stations; the work is scheduled to be completed in 2012. [OGK-5].	**EN14**
Lacustrine ecosystems	A biological and chemical study of the Isetskoe lake (Sredneuralskaya plant - SGRES - site) is planned. In 2011, a bathymetric study was carried out. The following programs will be implemented: in 2012, physical biological investigation on the use of the natural resources of the basin (watershed survey); in 2013, mathematical simulation in view of developing a strategy of mitigation of possible thermal impacts (due to the increase of water temperature). [OGK-5].	**EN14**
Grass Carp (*Amur bianco*) and macrophytes (*canna, eyhornia*)	To prevent the proliferation of lacustrine vegetation, use is made of a biological method, i.e. floating structures which contain fishes (grass carp, eating the upper aqueous vegetation) and macrophytes (*canna*, *eyhornia*, etc.), reducing the presence of nutrients for phytoplankton. [OGK-5].	**EN13**

Slovakia	Project	KPI GRI
Rainbow Trout (*Oncorhynchus mykiss*)	Conservation of the stream network and of the Rainbow Trout in the High Tatras national park. The project is aimed at removing human threats to the survival of this species, by purchasing and releasing 90% of the fry needed for its conservation, constantly monitoring and regularly cleaning up the streams. [Slovenské elektrárne].	**EN13**
Golden Eagle (*Aquila chrysaetos*) LC	High Tatras national park: protection, removal of threats, collection of blood samples for genetic analyses and rehabilitation of wounded eagles, monitoring and mapping of hunting grounds, microchip tagging and identification of nesting sites. Enel also initiated a cooperation project with the Tourist Club for educational initiatives. 2011 was a negative year for this species with only 8 couples in the park. [Slovenské elektrárne].	**EN13**
Tatra Chamois (*Rupicapra rupicapra tatrica*), Alpine Marmot (*Marmota marmota latirostris*), Peregrine Falcon (*Falco peregrinus*), Grey Wolf (*Canis lupus*), European lynx (*Lynx lynx*) LC	High Tatras national park: as part of the project of cooperation with national parks with a view to conserving the biodiversity of threatened species, emphasis was placed on five species. Results indicate increases in the number of: chamois, from 532 in 2007 to 967 in 2011; marmots (relocated from the western to the eastern part of the park), totaling 32 in the new home ranges; peregrine falcons, from 11 pairs in 2008 to 15 in 2011. In 2011, a project of monitoring, support and conservation of two other threatened species, the grey wolf and the European lynx, took off. [Slovenské elektrárne].	**EN13**

Spain	Project	KPI GRI
Mollusks	International commitment to research on *Dreissena polymorpha*, an invading exotic species which occurs in various Spanish water bodies. This is a freshwater bivalve zebra mollusk, similar to the common mussels and autochthonous of the Black Sea and Caspian Sea. This non-edible mollusk is known to withstand salty water and to rapidly reproduce and propagate. Fluvial navigation and maritime transport have facilitated the spreading of this species, causing serious economic and ecological effects, including interference with feeding, growth, movement, breathing and reproduction of other species (in particular, mussels and clams). [Endesa].	**EN14**
Osprey (*Pandion haliaetus*) and Black Kite (*Milvus migrans*) LC	Balearic Islands: under the cooperation program between Endesa and the Government of the Balearic Islands, projects of conservation (aimed above all at reducing collision with power lines) continue. [Endesa Distribución].	**EN14**
Bonelli's Eagle (*Hieraaetus fasciatus*) LC	Catalonia: monitoring of the Bonelli's eagle population, habitat and conservation status. In 2010, studies were conducted to determine the age, number, settlements and physical conditions of the eagles. 37 eagles were tagged to investigate their rates of dispersion and survival, as well as causes of mortality. [Endesa Distribución].	**EN13**
Egyptian Vulture (*Neophron percnopterus*) EN	Canary Islands: study to assess the effectiveness of measures taken in the previous two-year period to limit the risk of collision of the avian fauna with overhead medium-voltage lines in Fuerteventura and Lanzarote. [SEO-BirdLife and Endesa Distribución].	**EN14**
Flora, fauna, ecosystem and landscape	Andorra, As Pontes and Puertollano mining areas: hydrogeomorphological and landscape restoration to reinstate the original local biodiversity. [Endesa].	**EN13**
	Doñana national park (Andalusia): support to the initiatives of the Doñana 21 foundation for conservation of the natural heritage and maintenance of a wild birds' care center. [EUFER]. Development of a device to prevent avian fauna electrocution. [Endesa].	**EN13**
Flora, fauna, ecological equilibrium and landscape	Ebro-Pirineos and Ibones (small lakes) region: environmental regeneration of the area by removing obsolete installations and their appurtenances, restoring the landscape and recovering the autochthonous vegetation and fauna. [Endesa].	**EN13**
Cantabrian Capercaille (*Tetrao urogallus cantabricus*) LC Dupont's Lark (*Chersophilus duponti*) NT	Castilla y León: environmental monitoring surveys are under way in view of developing a plan for conservation of the populations of the Cantabrian capercaille (wind farm sites of Valdesamario, Peña del Gato and Manzanal) and of Dupont's lark (wind farm site of Padul). Actions to manage the habitats of these species are centered on: conservation of sheep and goat breeding, mountain crops and steppes and minimum use of pesticides inside the nature reserve. [Fundación Patrimonio Natural de Castilla y Léon and Enel Green Power].	**EN13**

Spain	Project	KPI GRI
Flora and fauna	Moralets hydroelectric project: biodiversity risk analysis; protective and corrective measures, e.g. a procedure for partially decreasing water level in the Llauset basin to avoid impacts and the fencing of the construction site to prevent the entry of and possible harm to wild fauna; proper waste management; removal and subsequent restoration of top soil; installation of systems for clean-up of outlets; use of a floating boom to avoid the dispersion of solids during works to enlarge the intake structure on the Llauset river; restoration of the cliff which will accommodate the spoil from the construction site; consolidation of the unstable foot of the de Fogà gully (three-year project). [Endesa].	**EN14** **EN13**
	Jabalcon hydroelectric project: biodiversity risk analysis; protective and corrective measures, e.g. fencing of the site to prevent possible harm to the fauna, preparation of the area by removing and subsequently restoring top soil, identification of nesting grounds to be protected during the most sensitive periods of breeding and use of a floating boom to avoid the dispersion of solids during works. Proper waste management measures and the installation of an ultrasound system preventing the entry of fishes into the basin are planned. [Endesa].	**EN14** **EN13**
	Balearic Islands: in 2008, biodiversity monitoring surveys were initiated along the power distribution lines located in the Natura 2000 sites. The surveys are aimed at assessing the impacts of tree cutting and pruning and possibly adopting mitigation measures. In 2011, the monitoring survey of the Island of Minorca was completed. [Endesa Distribución].	**EN14**
Avian fauna	Electricity distribution in the Balearic Islands: in 2004, under an agreement between Endesa and the Government of the Balearic islands (coordination of environmental efforts in connection with electricity distribution and conservation of the avian fauna), the "avilinea" (bird-friendly power lines) project was launched. The agreement, renewed in 2010, now covers works on power line towers and the insulation of some power lines to protect the avian fauna from collision and electrocution. In 2011, 58 projects were completed. [Endesa].	**EN14**
	Aragon: investments in infrastructures improved the protection of the avian fauna from the medium-voltage lines of Magallon-Valdeferrín, Ricla-Purroy, Belsierre-Yeba, Fuentes Claras-Bello. [Endesa].	**EN14**
	Andalusia and Extremadura: under the 2008 agreement with the Government of Andalusia (co-funding of the LIFE-Nature and Biodiversity project of conservation and management of special protection areas for the birds of the Andalusian steppe), the European Commission's LIFE Committee selected the project of identification of critical points of birds' collision with and electrocution from power lines. Development of other research projects in conjunction with research centers and public institutions. [Endesa Distribución].	**EN14**
	Distribución Canarias: installation of diverters to prevent birds' collisions with medium-voltage lines on the Island of Lanzarote. [Endesa Distribución].	**EN14**
Raptors	Villahermosa del Río (province of Castellón) municipality: management of raptor shelter areas. [Enel Green Power].	

North America

United States	Project	KPI GRI
Flora, fauna, ecosystem and landscape	Caney river wind farm (Kansas): a native environment conservation plan was launched to safeguard wildlife, preserve and restore the tall grass prairie and other important habitats and encourage research on new approaches to environmental protection in Kansas. [Enel Green Power jointly with the National Fish and Wildlife Foundation].	**EN13**
Atlantic salmon (*Salmo salar*), American shad (*Alosa sapidissima*)	Lawrence hydroelectric project: the new pneumatically-controlled inflatable crest gate makes it possible to monitor fish migration. Lowering of the crest gate at different points eliminates the attraction effect caused by the current. To assess the effectiveness of the system, the number of salmons swimming upstream for spawning is counted. In the spring of 2011, 402 adults of Atlantic salmon were counted. The caught salmons are delivered to the US Fish and Wildlife Service for restocking the Merrimack river basin and other areas of New England. Always in 2011, a similar study was conducted on the American shad (*Alosa sapidissima*), in response to the concerns of the fisheries agency. The presence of shads in the turbine outlet area was tracked via a 3D acoustic system, whereas previous studies had only investigated their passage inside the lifting system. Results confirmed migratory behaviors and will be used to plan a further evaluation of the system with a view to improving the upstream migration of this species. [Enel Green Power North America].	**EN14**

United States	Project	KPI GRI
Fish fauna (*Pomoxis nigromaculatus*, *Lepomis gibbosus*) and avian fauna	Ware Shoals hydroelectric project (South Carolina): by agreement with local communities, dried-up Christmas trees were placed into the lacustrine basin to create fish shelters from predators, sustain algal reproduction and growth and give rise to an ecosystem favoring the reproduction of insects as a food for fish. Efforts to protect and favor the nesting of ducks go on. [SCDNR and Enel Green Power North America].	**EN14**
Fish fauna	South Berwick hydroelectric project (Maine): in the spring of 2011, the New Hampshire Fish and Game Department placed a fish counter near the fish ladder on the Salmon Falls river. This is the site where fishes migrate every year to lay eggs. Over 3,400 fishes were counted in 2011. The caught fishes will be used for restocking the watershed. [NHFGD and Enel Green Power North America].	**EN14**
Fish restocking	Summersville (West Virginia): restocking of the Gauley river with trout and maintenance of the nearby area. [WVDNR and Enel Green Power North America].	**EN14**

Latin America

Argentina	Project	KPI GRI
Avian fauna	Arroyito hydro plant: in 2011, Enel continued its program of monitoring and control of third-party access to the lake area downstream of the plant. This area is home to migratory birds and thus to be protected. [Endesa].	**EN13**

Brazil	Project	KPI GRI
Flora	Cachoeira hydro plant: project of restoration of a riparian forest damaged by agropastoral activities in the areas surrounding the storage basin. The forest controls water flows, acts as a filter for sediment and nutrients, reduces landslides and erosion and provides protection and food to aquatic fauna, birds and mammals. In 2010, about 50,000 autochthonous species of trees and shrubs were sown over a total surface of 30 ha in the States of Goias and Minas Gerais. The surface already reforested in previous years, with about 90,000 typical species of the local savanna, amounts to 54 ha. Additionally, studies are conducted on wild fauna and fish fauna to understand their migration dynamics. [Endesa].	**EN13**
	Sustainable rural communities: project of conservation, forest management and sustainable forestry in the Biosfera Caatinga reserve (State of Ceará). These initiatives add to more specific ones which have the goal of easing the transition of farmers' families and small coal- and wood-processing firms to sustainable practices for growing crops (including energy crops). [Endesa].	**EN14**
	Reforestation: of different areas in the municipality of Miracema – Rio de Janeiro. [Endesa - Ampla].	**EN14**
	Biomonitoring: continuous monitoring of water quality and precipitation with a view to keeping the quality and quantity of water in the plant areas at acceptable levels for the survival of aquatic and terrestrial species. Monitoring and control of macrophyte populations to maintain the equilibrium of the aquatic ecosystem (habitat and species) inside the impoundment. Protection and management of forests to preserve their biodiversity and maintain a wildlife corridor. Access to these areas is controlled to prevent indiscriminate hunting and fishing. [Enel Green Power].	**EN14**
Environment	Production of eco-friendly dielectric oil: pilot project to introduce and certify eco-friendly oil extracted from Brazilian natural components, to be used in place of petroleum-derived mineral oil. [Endesa].	**EN14**
	Bio-septic tanks: project aimed at protecting the natural environment from anthropogenic pollution by providing workers with specific training on construction of septic tanks in the Macizo de Baturité region. [Endesa].	**EN14**
Brown-Throated Parakeet (*Aratinga pertinax*) LC Araripe Manakin (*Antilophia bokermanni*) CR	Protection of the indigenous fauna of the State of Ceará. [Endesa].	**EN14**

Chile	Project	KPI GRI
Flora	Atacama desert: project of conservation of Incas' crops under agreements with local communities which are aimed at creating new development opportunities and improving their quality of life. The project, initiated in 2008, provides technical support to the Caspana and Toconce communities (upper Loa river area) to improve production processes, to optimize the growing, treatment and yield of native crops (corn, quinoa, potato), to manufacture herbal teas and condiments, preserving the typical Andean and pre-Incan terrace farming and promoting the creation of fair and sustainable trading channels. [Fundación Semilla and GDN Chile (geothermal energy company)].	EN13
	Pullinque plant: maintenance of the area (100 ha) reforested with autochthonous species three years ago. [Enel Latin America].	EN13
	Chilectra: in compliance with the relevant legislation, trees were replanted over an area of 1.19 ha surrounding the Andes substation. The project involves the planting of groundcover species to mitigate the environmental impact. [Endesa].	EU13
	Thermal plant of Taltal: determination of the effects of NO_X and SO_2 emissions via biomonitoring and use of new biotic and abiotic environmental components on parcels of land which represent the biodiversity of flora and fauna in the Paposo area ecosystem. [Endesa].	EU13
Flora, ecosystem and landscape	Pilmaiquén plants: purchase of 8 ha of land (called la Isla park), to be converted into a nature reserve. [Enel Latin America].	EU13
Flora, fauna, ecosystem and landscape	Cooperation with the San Ignacio del Huinay Foundation (created by Endesa) and the Pontificia Universidad Católica de Valparaíso: in this area of about 34,000 ha, located in the Hualahuié municipality and extending from the Comau (or Leptepu) fjord, in the province of Palena, to Argentina, the foundation devotes itself to the conservation of the rainforests of the planet and to the study of marine invertebrates (49 new species classified), conducting microbiological investigations on hot springs, flora and fauna surveys and limnological studies of previously uninvestigated water bodies. These activities led to identify very numerous new species and ecosystems in areas of particular interest. In 2011, the foundation set the following targets: creating a nursery of indigenous forest species, conserving the marine protected area and issuing publications thereon. [Endesa].	EN13
Flora (*Baccharis macraei, Chorizanthe paniculata, Erigeron fasciculatus*)	Canela wind farm: maintenance of the area reforested in 2010 (about 50 ha) and its protection from lagomorphs. [Endesa].	EU13
Cactus plants	Canela wind farm: conservation of cactus plants relocated from some areas of the plant to other areas owned by the company. [Endesa].	EU13

Colombia	Project	KPI GRI
Mangroves	Cartagena thermal plant: in 2011, 1.5 ha of land in the area surrounding the lagoon were reforested; moreover, the second stage of the project (2012) was planned; the project involves actions to restore biodiversity in the lagoon, to monitor its fauna and to study ecological connectivity. [Endesa].	EN13
Fish fauna	Betania basin: seeding of about 360,500 individuals of autochthonous fishes jointly with local authorities and communities. [Endesa].	EU13
Flora, fauna and ecosystems	Betania basin: project of conservation, characterization and enhancement of the value of the ecosystems located on the left bank of the Magdalena river. The project, started in 2009, is intended to characterize flora and fauna, restore the landscape and create a trail for recreational purposes. Native species were sown along the eco-trail, improving fish habitats (and feeding opportunities) and strengthening the development of the ecosystem. [Endesa].	EN13
	Guavio river hydroelectric basin: program of conservation and sustainable power generation to protect water resources, biodiversity and the environment in the area of influence of the basin (2008) jointly with Corporación Autónoma Regional del Guavio, Fundación Patrimonio Natural and the Fund for Biodiversity and Protected Areas. In 2011, 10 ha around the basin were reforested; efforts continued to manage and protect 33 ha of polyphytic grassland with water springs, agroforestry systems for coffee growing and riparian areas; and a commitment was taken to manage another 15 ha of adjoining land. [Centro Nacional de Investigaciones del Café and Endesa].	EN13

Colombia	Project	KPI GRI
Wetlands, mangroves and forests	Codensa: planting of 10,000 autochthonous trees over a surface of 0.1 km^2 in the Hacienda Canoas-Minas (Soacha municipality) as a voluntary pledge to offset office paper consumption. This activity is part of a much more ambitious project ("Bosque de Endesa") of reforestation of an area of roughly 7 km^2. [Endesa].	**EU13**
Flora	Cava Muña: under the environmental management and restoration plan, the quarry faces were revegetated over an area of 1.9 ha. The quarry was used to extract material for works of improvement of the dams of the Muña basin, which stores the water needed by the Pagua power plants. [Endesa].	**EU13**

Costa Rica	Project	KPI GRI
Flora, ecosystem and landscape	Don Pedro and Rio Volcán hydro plants: funding of the activities conducted by the FUNDECOR NGO for conservation of 5,000 ha of forested areas; Enel owns 6.5 ha of this protected area near its two plants. [Enel Green Power].	**EN13**

Guatemala	Project	KPI GRI
Avian fauna	Maintenance of corridors near transmission lines over a surface area of about 6 ha. [Enel Latin America].	**EN13**
Flora, ecosystem and landscape	Matanzas/San Isidro and El Canadá/Montecristo hydro plants: reforestation of 11.8 ha with Oocarpa pines (*Pinus oocarpa*): the area which surrounds the plants has been heavily deforested by the local population. [Enel Latin America].	**EU13, EN13**

Mexico	Project	KPI GRI
Fish fauna	El Gallo hydro plant: fish restocking in the basin serving the plant, jointly with local anglers' communities and institutions. [Enel Green Power].	**EN14**
Iguana	El Gallo hydro plant: protection of some individuals of protected and threatened animals (iguana), which settled in the site escaping predation by the local population. [Enel Green Power]	**EN14**

Panama	Project	KPI GRI
Flora, fauna, ecosystem and landscape NT	Fortuna forest reserve: administration of 19,500 ha of forest, a national protected area with important animal species (large mammals, birds, reptiles, etc.) and plant species. Surveillance and patrolling of critical areas to prevent damage to and crimes against flora and fauna; communication to local communities, authorities and representatives (through meetings and brochures) on the most significant features of the area, on the prohibited activities and on the national legislation concerning resource management in the reserve; periodical bathymetric surveys to determine the level of siltation of the basin; organization of research activities (starting with biodiversity monitoring in the Fortuna site) with the involvement of national- and international-standing institutes. These activities identified, among others, the presence of near-threatened species, such as the jaguar. In 2011, two reforestation projects (total plants: 5,500) were completed. [Enel Latin America jointly with the Smithsonian Tropical Research Institute and the National Conservancy Association].	**EN13** **EU13**

Environmental risk assessment and management

In 2011, the Enel Group continued its efforts to manage environmental risks under a project (started in 2010) which will cover more than 500 sites all over the world by 2014.

The selected methodology permits to identify, analyze and map the potential risks arising from the operation of Enel's power generation and distribution installations and from the governance of environmental issues and their impacts on the environment and on Enel's strategy, reputation and financial resources.

The purpose of the project is to provide the management with qualitative elements and priority indications for its decision-making and planning process. Under the project, the performance of the various sites (belonging to different technological and legislative/regulatory contexts) is assessed vs. Enel's best practices in view of convergence towards the best environmental performance practices.

Analyses are updated on a yearly basis so as to reflect possible changes in Enel's internal and external context. These analyses are carried out by the "owners" of processes with an environmental impact, who are identified within the various sites and companies.

The methodology, based on predetermined criteria, consists of the following fundamental steps:

1. inherent risk assessment: assessment of the probability of occurrence of a critical event and of its impact under predefined criteria, assuming no control activities for risk mitigation;

2. control level assessment: assessment of the effectiveness of existing risk management and control activities aimed at managing or mitigating the risk;

3. residual risk calculation: the residual risk, i.e. Enel's exposure to the risk, is obtained by subtracting the control level from the inherent risk.

In 2011, the assessment covered 158 sites in 13 countries:

- 12 coal-fired thermal plants;
- 8 combined-cycle thermal plants;
- 23 oil/gas-fired thermal plants;
- 1 biomass-fired thermal plant;
- 37 hydro generation groups;
- 4 geothermal generation groups;
- 1 photovoltaic plant;
- 44 wind farms;
- 28 electricity distribution sites.

Awareness, training & education

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

In 2011, Enel developed education modules for its environment-dedicated personnel: in the overall Group, 84,331 person-hours of courses were delivered, mostly on environmental management systems.

With respect to 2010, a peak was recorded, which is mainly due to the increase of training & education activities in Italy, Colombia, Romania and Spain.

Conversely, the peak recorded in 2009 was due to the construction of the Bocamina II power plant in Chile.

The following tables show the person-hours of courses by business/line of activity and geographic area.

It is worth mentioning the activity carried out as part of the Group's ISO 14001 certification project (see chapter on environmental management systems).

A 40-hour course, divided in two modules (Auditing Techniques and Auditor/Lead Auditor) was delivered to 30 experienced and high-level professional figures that will be in charge of environmental audits within the framework of environmental management systems. Persons who have attended the course and subsequently acquired the necessary experience may take an exam for official recognition of their skills by a certification body. As part of the same project, basic training courses will be organized for all the members of the personnel. The courses, which will rely on distance teaching, are aimed at: building awareness of environmental issues, making personnel members accountable for the consequences of their decisions and actions on the environment, and promoting sustainable practices inside and outside workplaces.

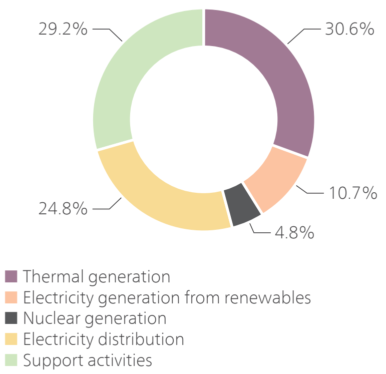
Awareness activities inside and outside the Company

Enel's Intranet site has a thematic section with CEO's messages, environmental policy, Environmental Reports, data on environmental management systems and environmental procedures issued at different organizational levels. Environment-dedicated personnel may have access to the environmental reporting application and thus to the environmental performance data of installations operated or activities carried out by Enel in different geographic areas. Links to the environmental pages of Enel's Intranet and Internet sites are also posted.

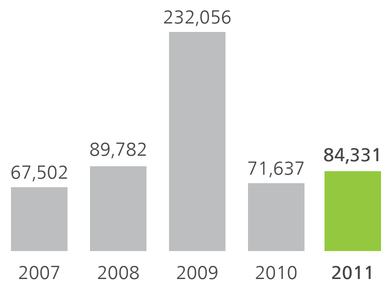
Enel's websites (http://www.enel.it/it-IT/azienda/ambiente/ and http://www.enel.com/en-GB/sustainability/environment/) have a comprehensive section dedicated to environmental themes.

The page gives access to the Environmental Reports (available from 2009 also in navigable version) and to links with relevant topics, e.g. the Group's environmental policy, commitment to the fight against climate change and to biodiversity conservation, EMAS and ISO 14001 environmental management systems, renewables, energy efficiency, innovative projects and emission abatement projects.

Environmental training & education in 2011
Total: 84,331 person-hours



Environmental training & education
(person-hours)



Business/line of activity (person-hours in 2011)

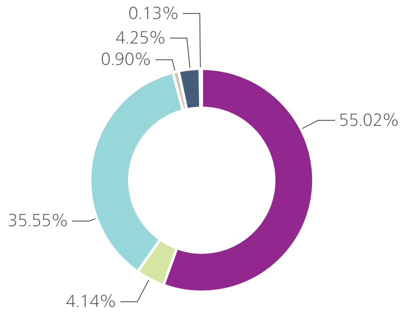
Thermal generation (including CHP)	Electricity generation from renewables	Nuclear generation (including CHP)	Electricity distribution	Environmental support activities	
25,782	9,007	4,035	20,903	24,604	84,331

Geographic area (person-hours in 2011)

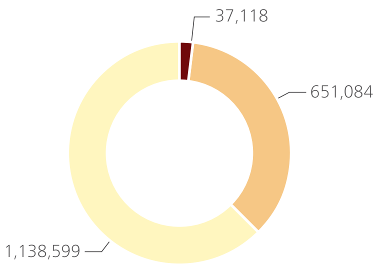
Italy	Spain	Russia	Rest of Europe	American continent	
20,913	19,612	6,527	20,242	17,037	84,331

Group's environmental results

Net maximum electrical capacity of power plants as of Dec. 31, 2011
Total: 85,123 MW



Circuit-length of power lines as of Dec. 31, 2011
Total: 1,826,801 km



Electricity generation (especially thermal) is the activity of Enel which has the most significant effects on and interactions with the environment.
However, this Eco-Balance also takes into consideration the other activities that Enel carries out in the world and quantifies their environmental aspects in aggregated form.
The data of the Eco-Balance are divided into the following four parts [1], each of which shows not only absolute data, but also specific performance indicators:

> status data;
> resources;
> processes and products;
> emissions, liquid releases and waste.

For each item, the Eco-Balance provides and comments on the data regarding the past five years.
To facilitate the understanding and assessment of the Eco-Balance, the following graphs and tables summarize the key data of Enel's installations in the world as of December 31 of each of the years from 2007 to 2011 ("status data").
The status data and absolute values of resources, processes and products, emissions, liquid releases and waste are accompanied by appropriate indicators (ratios between homogeneous or heterogeneous quantities). These indicators express Enel's environmental performance over time, whatever the volume of activities in each year. Details on their nature and commentaries, if any, on their trends are provided.
Details on absolute data and indicators are shown in the datasheets and tables pertaining to each country where Enel is present.

(1) In the tables of this section and in those of the individual countries, the expression "various activities" means a number of activities (not all of which are present in the different contexts) which contribute – albeit to a minor extent – to the following:
> consumption of fuels (in this case, the activities are mining & extracting, fuel storage & handling, geothermal drilling, operation of auxiliary boilers and emergency generating sets in business/lines of activities other than thermal generation, service and real-estate management);
> consumption of electricity (in this case, the activities are mining & extracting, fuel storage & handling, gas distribution, service and real-estate management);
> CO_2 emissions (in this case, the activities are mining & extracting, fuel storage & handling, gas distribution, geothermal drilling, operation of auxiliary boilers and emergency generating sets in business/lines of activities other than thermal generation, service and real-estate management);
> waste production (in this case, the activities are mining & extracting, fuel storage & handling, gas distribution, service and real-estate management).

Status data

Absolute values

		2007	2008	2009	2010 [1]	2011
Power-generating installations						
Power plants	no.	1,172	1,158	1,070	1,112	1,079
thermal	no.	104	98	102	103	103
nuclear	no.	5	5	5	5	5
hydro	no.	873	858	768	811	789
geothermal	no.	32	32	34	35	35
wind	no.	154	161	155	151	175
solar (photovoltaic)	no.	4	4	6	7	18
Net maximum electrical capacity	MW	71,687	70,222	82,916	85,913	85,123
thermal	MW	39,538	38,088	46,046	47,832	46,836
nuclear	MW	2,441	2,442	3,522	3,514	3,527
hydro	MW	27,122	26,561	30,279	31,033	30,265
geothermal	MW	678	687	742	775	769
wind	MW	1,902	2,440	2,303	2,731	3,619
solar (photovoltaic)	MW	4.52	4.2	23.9	27.4	108
Combined heat & power installations						
Power plants	no.	12	21	22	22	24
thermal	no.	10	19	20	20	22
nuclear	no.	2	2	2	2	2
Net maximum electrical capacity	MW	2,995	11,218	11,283	11,360	12,212
thermal	MW	1,355	9,506	9,521	9,544	10,394
nuclear	MW	1,640	1,712	1,762	1,816	1,818
Useful thermal capacity	million kcal/h	477	3,198	3,340	3,329	3,613
thermal	million kcal/h	87.9	2,785	2,876	2,865	3,149
nuclear	million kcal/h	389	413	464	464	464
Power lines (circuit-length)						
Total	km	1,571,009	1,586,845	1,785,270	1,810,951	1,826,801
high-voltage	km	45,023	44,753	38,705	36,882	37,118
medium-voltage	km	536,374	544,795	638,698	645,479	651,084
low-voltage	km	989,613	997,297	1,107,866	1,128,591	1,138,599
Gas pipelines						
Total	km	30,664	31,765	3,440	0	-
high-pressure	km	58.8	205	1,007	0	-
medium-pressure	km	11,766	12,342	1,596	0	-
low-pressure	km	18,839	19,219	837	0	-

(1) For details about changes in assets, refer to the chapters devoted to the various countries where the Group is present.
-: no data due to absence of activities in the year.

		2007	2008	2009	2010 (1)	2011
Mining & extracting activities (2)						
Mining activities						
Mines	no.		8	8	8	7
coal	*no.*		*5*	*5*	*4*	*3*
brown coal	*no.*		*3*	*3*	*4*	*4*
Amount of fuels extractable since the start of activities	Mt		60	60	399	402
Areas occupied by excavations and other activities	ha		2,724	5,351	4,448	4,510
coal mines	*ha*		*2,714*	*5,341*	*4,438*	*3,756*
other mines	*ha*		*10*	*10*	*10*	*754*
Extracting activities (gas)						
Areas occupied by excavations, drilling and other activities	ha	0	500	-	-	-
EN29 **Real-estate & service management** (3)						
Vehicle fleet						
service vehicles	no.	0	14,065	16,185	15,858	16,007
special vehicles	no.	0	2,244	2,537	2,164	2,054
vehicles for both private and service use	no.	0	1,019	1,244	1,153	1,911
Gross real-estate surface area	thousand m^2	1,253	1,749	1,836	2,549	45,317

(1) For details about changes in assets, refer to the chapters devoted to the various countries where the Group is present.
(2) These activities have been surveyed since 2008.
(3) These activities have been surveyed since 2007.
-: no data due to absence of activities in the year.

Changes in Enel's assets

In the past five years, Enel has recorded major changes in its assets, which are reflected in the status data.

> In 2007, Enel continued to sell part of its Italian power grids to local companies, as per Legislative Decree 79/1999 on rationalization of the electricity distribution business.
> In the course of 2007, Enel acquired important renewable-power generation assets in Latin America (Brazil, Mexico and Panama).
> In October of the same year, Enel completed the acquisition of 67.05% of the Endesa Group, the major power producer and distributor of Spain with significant operations in a large part of Latin America.
> In the same month, Enel acquired control of some wind power generation assets located in Greece.
> In June 2008, Enel acquired a controlling stake in the Russian company OGK-5.
> In June 2008, Enel acquired a majority holding in the electricity distribution company Muntenia Sud (which then became Enel Distributie Muntenia) in Romania.
> In the same month, Enel sold the companies Viesgo Generación and Viesgo Distribución to E.ON.
> In July 2008, Enel inaugurated its first wind farm in France.
> In the same year, acquisitions of gas grid assets in Italy – especially of the infrastructures of Avisio (Trento) – were dominant over sales.
> In 2009, most of the high-voltage distribution grid in Italy was transferred from Enel Distribuzione to Terna under the agreement signed on December 29, 2008.
> In February of the same year, Enel completed the acquisition of Endesa by transferring some hydro and wind power plants in Portugal and Spain to Acciona, as part of the deal under which Acciona sold its stake in Endesa to Enel.
> In September 2009, Enel sold Enel Rete Gas, which is no longer part of the Group's consolidated assets.
> In 2009, the Enel Group started its operations in Ireland (thermal generation) through Endesa and extended those in Bulgaria (wind generation) through Enel Green Power.
> In the same year, Enel Green Power inaugurated its first two wind farms in Romania.
> In 2010, the Group sold its gas grid assets in Spain and its high-voltage grid in the Canary and Balearic Islands (consequently, it does no longer own gas pipelines).
> In 2011, Enel continued to deploy renewables, in particular through Enel Green Power, whose net maximum capacity was up by about 800 MW thanks to the commissioning of wind farms in France, Greece, Portugal, Romania, Spain and the United States, and of photovoltaic plants in Italy, Greece and the United States.

> At the end of June 2011, Enel finalized the sale of its Maritza plant, a brown coal-fired thermal plant with a net maximum capacity of 808 MW.
> Always in 2011, Enel Produzione's consolidated holdings in the company HDE (headquartered in Trento) and in the two plants of San Floriano Egna and Stramentizzo decreased from 100% to 49% and 33%, respectively; the latter plants were acquired by the company San Floriano Energy (headquartered in Bolzano). As a result, Enel Produzione's net maximum hydro capacity was down by about 800 MW.
> Moreover, in the last months of 2011, Enel's holding (51%) in Deval and Vallenergie was sold to CVA.

Key Performance Indicators - KPIs

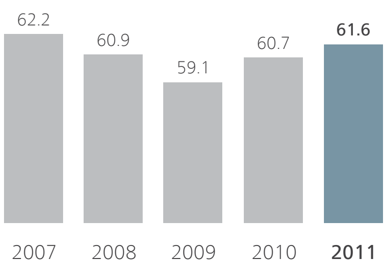
		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	51.5	45.4	43.1	45.5	46.6	-9.50	2.40
underground	% of entire LV grid	29.5	32.7	33.2	33.2	33.4	13.2	0.600
Total cable lines	**% of entire LV grid**	**80.9**	**78**	**76.3**	**78.7**	**79.9**	**-1.20**	**1.50**
MV cable lines								
overhead	% of entire MV grid	2.01	2.05	2.03	2.08	1.88	-6.50	-9.60
underground	% of entire MV grid	30.4	32.2	30.5	30.4	30.9	1.60	1.60
Total cable lines	**% of entire MV grid**	**32.4**	**34.3**	**32.5**	**32.5**	**32.8**	**1.20**	**0.900**
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	62.2	60.9	59.1	60.7	61.6	-1.00	1.50

EN29 Overhead and underground cables in power lines

As regards land and landscape protection, Enel pursues two main strategies to mitigate the impact of the construction of new grids and of the revamping of old ones:
> underground cables in low-, medium- and high-voltage lines;
> helically-twisted cables (elicord) in low- and medium-voltage lines; the cable consists of three twisted and insulated phases.

Underground cables are used in built-up areas in place of bare conductors. The use of twisted cables in overhead lines mitigates their overall visual impact because: i) the cable is less visible than three separate conductors; and ii) it can cross forested areas, fully integrating into the vegetation thanks, among others, to the smaller space requirements of its supports.
The percentage ratio of the length of overhead and underground cables in power lines to the total length of power lines expresses the level of mitigation of the visual impact of power lines.
In 2011, this ratio was up by about 1 percentage point on 2010, with a total value of approximately 61.6%.

Overhead and underground cables in HV+MV+LV distribution lines (% of total length)



EN29 Transport vehicles

The data of the Group's vehicles are displayed in the status data table.

The impact of the Group's vehicle fleet is due to fuel consumption and to polluting and greenhouse gas emissions into the atmosphere (calculated as direct emissions under the "various activities" heading). Enel is trying to mitigate this impact by switching to certified vehicles having a higher efficiency (e.g. Euro 5).

Under its ISO 14001-certified or EMAS-registered environmental management systems, Enel assesses the indirect impact caused by suppliers and contractors in the use of transport vehicles, so as to reward companies demonstrating more environment-friendly behaviors (e.g. all other conditions being equal, preference is given to ISO 14001-certified or EMAS-registered companies).

EN16 EN17 The following table shows the indirect emissions of CO_2 generated by the transport (**scope 3**) of coal by sea and by rail, of of other fuels (gas oil, RDF, biomass), waste and other materials by road, as well as the indirect CO_2 equivalent emissions generated by coal extraction; the emissions of CO_2 due to electricity consumption (**scope 2**, see § "EN4 Primary electricity") in electricity distribution, fuel handling, coal extraction and real-estate management are also reported.

CO_2 emissions from coal transport by sea are estimated from the transported quantity (for the year 2007, it was equivalent to 100% of the total coal used and, for the years 2008-2011, to 52%), considering Panamax ships with a tonnage of 67,600 t, covering an average distance of 700 nautical miles in 22 days of cruising, with a consumption of 35 t/day of fuel oil and a CO_2 emission factor of 3.2 kg/l of burnt oil.

CO_2 emissions from railway transport of coal are estimated from the transported quantity (for the years 2008-2010, it was equivalent to 43% of the total), considering trains with a carrying capacity of 1,100 t, covering an average distance of 1,400 km, with a consumption of 6.9 kWh/t every 100 km of travel and Enel's average CO_2 emission factor in the world.

In the case of coal extraction, the emissions of greenhouse gases are calculated on the basis of the emission factors reported in the "2006 IPCC Guidelines for National Greenhouse Gas Inventories". These factors are different for surface mining (1.15 m^3/t) and deep mining (17.5 m^3/t) and multiplied by the tonnes of fuel extracted (50% for surface mining and 50% for deep mining). The 100-year Global Warming Potential (GWP) used (25) is specified in the "IPCC Fourth Assessment Report: Climate Change 2007".

CO_2 emissions due to transport of expendables, gas oil, solid biomass, RDF and waste are estimated from the transported quantities of raw materials, considering trucks with a tonnage of 28 t, covering an average round-trip distance of 50 km, with a consumption of 1 liter of gas oil every 3 km of travel and a CO_2 emission factor of 3 kg/l of burnt gas oil.

EN16 EN17		2007	2008	2009	2010	2011
Total emissions	**kt_{eq}**	**3,848.5**	**5,625.5**	**6,437.4**	**6,210.8**	**7,519.9**
Indirect CO_2 equivalent emissions (scope 2 EN16)	**kt**	**218**	**220**	**232**	**245**	**332**
Indirect CO_2 equivalent emissions (scope 3 EN17)	**kt**	**3,630.5**	**5,405.5**	**6,205.4**	**5,965.8**	**7,187.9**
from transport of coal by sea	kt	684	475	544	525	647
from transport of coal by rail	kt		449	483	440	581
from coal extraction	kt	2,933	4,457	5,151	4,974	5,933
from transport of other fuels (gas oil, biomass, RDF)	kt	1.1	2.3	2.2	2.1	2.3
from transport of waste	kt	1.9	4.0	4.7	4.2	3.8
from transport of other materials	kt	10.5	18.2	20.5	20.5	20.8

Resources

Absolute values

		2007	2008	2009	2010	2011
EN1 EN3 Fossil fuels						
Thermal generation						
fuel oil	thousand t	2,157	2,862	3,104	2,625	2,328
	thousand toe	2,116	2,818	3,045	2,562	2,234
HS	*thousand t*	*46.4*	*6.18*	*6.92*	*4.36*	*0*
	thousand toe	*44.6*	*5.87*	*6.57*	*4.14*	*0*
MS	*thousand t*	*179*	*310*	*256*	*191*	*107*
	thousand toe	*171*	*300*	*248*	*185*	*103*
LS	*thousand t*	*831*	*1,708*	*2,180*	*2,186*	*2,032*
	thousand toe	*798*	*1,679*	*2,137*	*2,128*	*1,942*
VLS	*thousand t*	*1,100*	*838*	*661*	*245*	*189*
	thousand toe	*1,102*	*834*	*654*	*245*	*189*
gas oil	thousand t	551	1,653	1,950	1,612	1,349
	thousand toe	498	1,619	1,995	1,663	1,373
natural gas	million m^3	8,053	10,130	9,146	9,746	10,159
	thousand toe	6,896	8,678	7,862	8,410	8,815
technologically captive use	*million m^3*	*5,702*	*8,391*	*7,806*	*8,719*	*9,284*
	thousand toe	*4,886*	*7,187*	*6,725*	*7,540*	*8,076*
of which in combined-cycle units	million m^3	5,077	7,809	7,257	8,057	8,553
	thousand toe	4,340	6,684	6,255	6,969	7,440
non-technologically captive use	*million m^3*	*2,351*	*1,739*	*1,339*	*1,027*	*875*
	thousand toe	*2,010*	*1,491*	*1,136*	*870*	*738*
coal	thousand t	16,635	19,998	20,598	17,535	23,538
	thousand toe	9,306	11,328	11,800	10,060	13,361
brown coal	thousand t	7,192	8,382	7,915	9,048	2,698
	thousand toe	1,199	1,548	1,440	1,556	856
coke-oven gas	million m^3	0.002	0.002	0.003	0.009	0.009
	thousand toe	0.003	0.002	0.003	0.010	0.010
Total	**thousand toe**	**20,015**	**25,991**	**26,142**	**24,251**	**26,638**
	TJ	837,968	1,088,172	1,094,528	1,015,346	1,115,297

		2007	2008	2009	2010	2011
EN1 EN3 Fossil fuels						
Thermal generation (CHP)						
fuel oil	thousand t	55.6	84.4	89.4	62.9	68.2
	thousand toe	52.7	83.2	87.0	61.2	66.9
MS	*thousand t*	*0*	*55.4*	*59.7*	*50.0*	*33.6*
	thousand toe	*0*	*53.6*	*56.4*	*48.4*	*32.9*
LS	*thousand t*	*55.6*	*29.0*	*29.7*	*12.9*	*34.6*
	thousand toe	*52.7*	*29.6*	*30.5*	*12.8*	*34.0*
gas oil	thousand t	0.031	0.030	0.003	0.150	0.137
	thousand toe	0.032	0.033	0.004	0.136	0.069
natural gas	million m^3	59.8	3,948	6,185	6,778	7,523
	thousand toe	54.1	3,192	5,018	5,505	5,730
technologically captive use	*million m^3*	*21.4*	*185*	*65.6*	*105*	*403*
	thousand toe	*19.7*	*154*	*56.1*	*88.1*	*331*
of which in combined-cycle units	million m^3	0	168	51.0	88.4	359
	thousand toe	0	139	42.5	73.1	295
non-technologically captive use	*million m^3*	*38.4*	*3,764*	*6,119*	*6,673*	*7,120*
	thousand toe	*34.4*	*3,039*	*4,962*	*5,417*	*5,399*
coal	thousand t	837	7,936	11,993	13,933	12,821
	thousand toe	502	3,204	5,073	5,494	5,208
brown coal	thousand t	1,981	2,318	2,308	2,273	2,424
	thousand toe	505	585	571	575	600
Total	**thousand toe**	**1,113**	**7,064**	**10,749**	**11,636**	**11,604**
	TJ	**46,598**	**295,774**	**450,042**	**487,156**	**485,843**
Various activities	thousand toe	25.0	44.8	56.5	43.2	44.9
Grand total	**thousand toe**	**21,152**	**33,100**	**36,948**	**35,930**	**38,287**
	TJ	**885,612**	**1,385,822**	**1,546,937**	**1,504,310**	**1,603,018**
EN1 EN3 Hydrogen						
Thermal generation	thousand m^3	0	0	0	3.54	1.06
	thousand toe	0	0	0	0.881	0.263
	TJ	0	0	0	41.9	11.0
EN1 EN3 Biomass and waste						
Thermal generation						
solid biomass	t	65,427	115,905	223,616	267,666	351,679
	toe	17,458	32,271	70,717	83,211	112,022
liquid biomass	t	36.9	114	336	350	423
	toe	37.6	115	331	298	360
biogas	thousand m^3	0	0	33,104	37,442	38,266
	toe	0	0	13,197	14,846	15,134
RDF	t	32,081	22,546	55,235	46,136	56,106
	toe	12,990	9,129	23,027	19,377	23,839
Thermal generation (CHP) (solid biomass)	t	400,458	451,239	411,188	424,854	381,428
	toe	89,181	100,479	91,910	95,706	85,754
Grand total	**thousand toe**	**120**	**142**	**199**	**213**	**237**
	TJ	**5,010**	**5,945**	**8,339**	**8,936**	**9,927**

		2007	2008	2009	2010	2011
EN1 EN3 Nuclear fuel						
Nuclear generation	t (discharged)	16.2	25.6	79.7	36.4	90.4
	thousand toe	na	na	6,191	6,040	6,857
Nuclear generation (CHP)	t (discharged)	36.6	37.5	36.0	37.4	38.5
	thousand toe	na	na	3,727	3,782	3,972
Grand total	thousand toe	na	na	9,918	**9,822**	**10,828**
	TJ	na	na	415,258	411,246	453,350
EN1 EN3 Geothermal fluid						
Total fluid extracted	thousand t	62,075	59,371	76,375	93,280	94,292
net of reinjected fluids	*thousand t*	*30,364*	*29,855*	*28,462*	*27,486*	*26,878*
Used for electricity generation	thousand t	55,812	53,130	70,982	87,968	87,873
EN4 Primary electricity						
Various activities	million kWh	127	131	163	175	235
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	101	157	156	134	136
From wells	million m^3	6.32	11.3	14.5	15.3	14.5
From aqueducts	million m^3	6.65	8.91	11.0	8.99	8.90
Total abstraction from inland waters	**million m^3**	**114**	**177**	**182**	**158**	**160**
From the sea (as-is)	million m^3	12.1	13.0	8.60	8.31	7.80
From the sea (desalinated)	million m^3	6.47	7.63	9.30	9.71	10.3
EN10 From waste waters (used inside plants)	million m^3	6.16	15.2	16.9	23.7	12.8
Total requirements	**million m^3**	**139**	**213**	**217**	**200**	**191**
for thermal generation	million m^3	85.1	109	109	101	94.3
for thermal generation (CHP)	million m^3	16.6	62.7	62.1	53.1	48.7
for nuclear generation	million m^3	0.164	0.929	1.47	1.40	1.81
for nuclear generation (CHP)	million m^3	37.0	38.5	40.4	41	43.7
for geothermal drilling	million m^3	0.049	0.007	0.211	0.059	0.047
for fuel storage & handling	million m^3	0.010	0.016	0.051	0.042	0.043
for mining & extracting activities	million m^3	0	2.64	3.09	2.92	2.11
EN8 Open-cycle cooling water						
For thermal generation (simple and CHP)	million m^3	11,809	20,166	23,210	23,643	23,159
For nuclear generation (simple and CHP)	million m^3	433	1,827	2,435	2,988	2,417
Total	**million m^3**	**12,242**	**21,993**	**25,645**	**26,631**	**25,576**
Water for non-industrial uses						
Real-estate & service management	million m^3	1.32	1.52	4.64	2.68	3.60

		2007	2008	2009	2010	2011
EN1 Expendables						
Resins	t	82.5	148	504	276	270
Hydrazine	t	79.8	58.3	83.4	68.0	68.7
Carbohydrazide	t	270	269	296	31.9	29.2
Hydrogen peroxide	t	83.5	46.3	0.231	0.749	1.10
Ammonia	t	22,125	20,127	20,567	15,669	18,363
Limestone for flue-gas desulfurization	t	514,034	1,136,959	1,097,191	1,028,003	1,108,004
Magnesium oxide	t	33.3	136	326	279	235
Sodium hypochlorite	t	2,448	7,450	5,827	4,488	6,497
Chlorine dioxide	t	0	0	0.514	0.875	0.709
Ferrous sulfate	t	10.2	255	272	279	311
Ferrous chloride	t	39.9	44.2	41.0	20.2	34.7
Trisodium phosphate	t	12.7	29.8	35.6	33.1	31.9
Lime	t	26,360	36,436	33,374	25,337	22,601
Ferric chloride	t	1,128	1,091	1,239	1,233	1,280
Polyelectrolyte	t	57.7	93.5	120	112	144
Sulfuric & hydrochloric acids	t	8,242	12,361	15,111	13,554	15,220
Caustic soda	t	17,653	21,154	32,118	30,623	35,557
Bentonite	t	549	1,696	1,739	518	937
Barite	t	0	0	471	216	0
Geothermal cement	t	2,729	3,909	4,559	2,905	2,254
Lubricating oil	t	1,068	12,005	17,702	7,239	7,200
Dielectric oil	t	494	1,604	1,383	1,333	1,164
Printing paper	t	1,393	1,224	1,284	1,218	1,251
Other	t	2,281	14,161	12,519	42,753	44,846
Total	**t**	**601,172**	**1,271,257**	**1,246,764**	**1,176,189**	**1,266,299**
for thermal generation	t	482,865	1,125,440	1,090,140	1,043,834	1,115,797
for thermal generation (CHP)	t	92,475	110,896	108,781	90,661	104,965
for nuclear generation	t	0	2,433	1,047	1,108	1,403
for nuclear generation (CHP)	t	5,771	5,738	6,361	6,145	6,776
for hydro generation	t	301	616	797	562	639
for geothermal activities	t	17,845	20,661	30,557	28,185	31,924
for wind generation	t	17.5	62.5	1,395	56.7	42.6
for fuel storage & handling	t	0.047	0.105	712	169	186
for electricity distribution	t	413	594	624	956	743
for gas distribution	t	91.1	91.8	0	0	0
EN1 PCB survey (1)						
Equipment & transformers with PCBs > 500 ppm (excluding their oil)	t	6,634	77.5	999	81.8	37.0
Oil with PCBs > 500 ppm contained in equipment & transformers	t	3,346	69.8	340	5.90	1.08
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t	142	988	20,377	24,766	19,525
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t	216	341	4,382	6,238	4,590

(1) The erratic pattern of the five-year series is due to the opposite effects (of positive and negative sign) of the change of the reporting perimeter (Endesa has reported these items since 2009) and to the progressive decommissioning or decontamination of equipment containing PCBs > 500 ppm.

EN1 EN3 Fuels

The near totality of fuels (mostly of fossil origin) are used 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%).
- > Coal and brown coal are used in power plants usually equipped with flue-gas desulfurizers and denitrification systems.
- > Gas oil, a high-cost fuel, is used on an exceptional basis: i) in single-cycle gas-turbine power plants that are not connected to the natural gas grid (as an emergency fuel in the other gas-turbine power plants); ii) in diesel-engine power plants (supplying some small Italian islands); iii) in start-up of steam-cycle power plants, auxiliary boilers and emergency generating sets.
- > The consumption of natural gas is broken down on the basis of its uses: non-technologically captive (when the use of gas is a corporate choice) and technologically captive (when gas feeds single-cycle, combined-cycle or repowering gas turbines, for which it is the only practicable option).
- > The contribution of non-fossil fuels consists of:
  - – refuse-derived fuel (RDF), co-fired with coal;
  - – solid biomass, used as main fuel or co-fired with coal;
  - – biodiesel, used in some gas-turbine units located on small Italian islands;
  - – biogases, used in some small installations with alternative engines located in Spain.

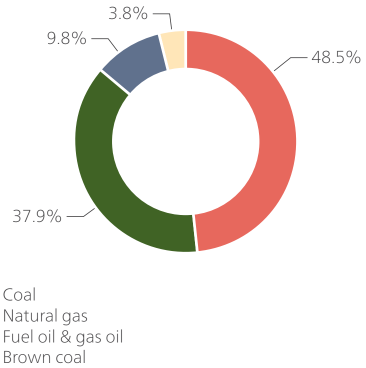
Natural gas and start-up gas oil feed the boilers which heat the fuel oil contained in storage tanks (heating fluidifies fuel oil before its transfer to destination). Small quantities of gas oil are also used for driving geothermal drilling equipment and in emergency generating sets, which are present in practically all of Enel's installations. Fuel consumption, measured and certified in each installation, is expressed both in metric units (thousand tonnes or million cubic meters) and in energy potential (tonnes or thousand tonnes of oil equivalent – toe or ktoe – and thousand billions of Joules – Terajoules – TJ). To sum the various contributions, use is instead made of the corresponding energy potential.

The consumption of fossil fuels in the overall Group rose from ~36 Mtoe in 2010 to ~38 Mtoe in 2011, owing to lower hydraulicity and consequent higher thermal generation (+~12 TWh), especially from coal and brown coal.

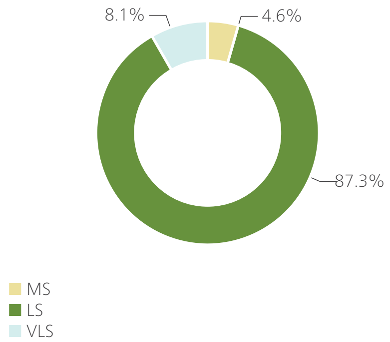
The fuel mix in 2011 showed an increase of the share of coal (about 5 percentage points) and a decrease of those of brown coal, fuel oil & gas oil (about 2 percentage points) and of natural gas (about 1 percentage point).

Electricity generation from fuel oil and gas oil was down by ~1 TWh. With respect to 2011, the consumption of oil products with different sulfur content was as follows: high-sulfur oil dropped to zero; medium-sulfur oil continued to decline (from ~9% to ~5%); low-sulfur oil continued to have an upward trend (from ~82% to ~87%); and very low-sulfur oil continued to have a downward trend (from ~9% to ~8%).

Fossil-fuel consumption for thermal generation (simple and CHP) in 2011
Total: 38.3 Mtoe

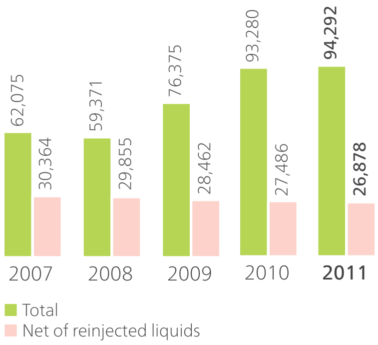


Fuel oil consumption for thermal generation in 2011
Total: 2.3 million t



EN1 EN3 Geothermal fluid

Consumption of geothermal fluid (thousand t)



Geothermal fluid, in the form of steam at adequate pressure (4-18 bar) and temperature (160-230°C), is the energy source for geothermal generation.

If the extracted fluid has thermodynamic properties unsuitable for geothermal generation, it may be used for the same purpose in an indirect way, by resorting to binary cycles (e.g. in North America, where the geothermal resource is a low-salinity brine at a temperature of 135-165°C), or it may be employed in non-electric uses. In the case of Enel, these uses are now limited to the supply of heat (especially for greenhousing and district heating, but also as process heat in the food industry). For the supply of heat, use is also made of the fluid which becomes available after expansion in Enel's only geothermal unit equipped with an atmospheric-exhaust turbine.

The production capability of geothermal fields is mostly sustained by the reinjection of fluids into geothermal reservoirs. These fluids consist of: water entrained by steam and separated from it at the well outlet; steam condensed after its expansion in the turbines; and liquid remaining after use in the primary circuits of binary cycles and after non-electric uses. Reinjection and extraction of fluids into/from the deep subsoil do not jeopardize shallow aquifers, which are isolated from wells by casings, cemented to the soil and between them.

The difference between the total fluid extracted and the liquids reinjected is due to: incondensibility of the gases contained in geothermal steam; vaporization and entrainment of condensates in cooling towers (by far the largest contribution) and inevitable losses.

In 2011, the fluid used for electricity generation was practically equivalent to the one of the previous year.

EN1 EN3 Nuclear fuel

Nuclear fuel is the fissile material forming the core of the reactor; for instance, enriched natural uranium, in assemblies of sealed metal rods, represents the energy source for nuclear power generation.

Reload is needed when, after being utilized in the reactor for a few years, the fuel has a lower content of fissile uranium and loses its efficiency. Reload is usually carried out on a 12-, 18- or 24-month basis, but only replacing a fraction of the core. Fuel is loaded into the core, shuffling the remaining assemblies that have not been unloaded, so as to optimize fuel utilization. The content of fission products (high-activity and "long-lived" radioactive waste) in spent fuel is as little as about 3%. The remaining components are: unused uranium (about 96%), which is recovered via reprocessing and may be used for generating new fuel; and plutonium (about 1%), which is a by-product resulting from nuclear reactions and radioactive decays of U238. The plutonium isotopes (Pu239 and Pu241) are fissile. These isotopes may be recycled and used to prepare fresh fuel: MOX, a mixture of U235 and fissile elements of plutonium; the content of fissile plutonium in MOX is around 7-9%, approximately equivalent to uranium oxide fuel enriched to 4.5% in U235.

In a nuclear power plant, nuclear fuel management consists of three stages:

> procurement and dry transport of fresh nuclear fuel;

> storage of fresh fuel inside the plant, preparation of reload (reactor refueling), reload (replacing spent fuel with fresh fuel), start-up tests, monitoring of operation, unloading of spent fuel from the reactor and storage in the reactor pools (water serves as a shield against radiations from spent fuel and cools down spent fuel by removing its decay heat) prior to transfer to temporary storage facilities, both on-site or off-site (spent fuel may be stored in other pools or, in dry form, in shielded casks);

> organization of the transfer of spent fuel, temporarily stored in pools or in dry storage facilities, to reprocessing facilities or to the final storage site, where available; the transfer of spent fuel from the temporary storage facility to reprocessing or final storage facilities is necessary after a certain number of years of operation of the plant in order to avoid saturation of the capacity of temporary storage facilities.

EN4 Primary electricity

Electricity is used as energy raw material in fuel oil storage & handling, mining & extracting activities and real-estate management.

It is used to pump fuel oil into pipelines, to handle solid fuels and to light, heat and cool buildings, respectively.

In electricity distribution, electricity is used for the operation of grids.

The amounts of net electricity generation and of electricity wheeled on distribution grids (see "Processes and products") already take into account own consumption and losses.

The following table displays the primary electricity used for fuel storage & handling, mining activities, real-estate management and services for the overall Group.

Indirect electricity consumption by activity

		2009	2010	2011
Fuel storage & handling	GJ	4,741	23,436	28,631
	GWh	1.3	6.5	8
Electricity distribution	GJ	1,513,998	1,589,990	2,161,001
	GWh	420.6	441.7	600.3
Real-estate management	GJ	574,934	558,965	767,729
	GWh	159.7	155.3	213.3
Mining	GJ	8,078	48,776	49,334
	GWh	2.2	13.6	13.7
Total consumption of electricity from non-renewable sources	**GJ**	**2,101,752**	**2,221,168**	**3,006,695**
	GWh	**585**	**617**	**835**

The higher indirect consumption in fuel handling, electricity distribution and mining may be ascribed to the increase in the overall volumes of the three activities, whereas the higher indirect consumption in real-estate management is due to the increase in the number of buildings monitored in 2011.

EN8 Water for industrial uses

Water for industrial uses is consumed above all in thermal and nuclear power plants, especially to make up for the amounts lost in the generation process of steam-turbine power plants and in closed-cycle wet cooling tower systems, but also to carry out clean-up jobs (above all of boilers) and to feed auxiliaries and desulfurizers.

To a much lesser extent, water is used:

> in geothermal activities for preparation of the drilling slurry; the amounts of water used in these activities are very variable, depending on the type of activity (e.g. drilling of new wells, rehabilitation or deepening of existing ones) and on the characteristics of the geological formations crossed (by contrast, the functioning of cooling towers does not require water, since it is based on revaporization of part of the condensates from the steam discharged by turbines);

> in fuel oil storage & handling, especially for preparing demineralized water; this water is used to make up for the amount lost in the closed-cycle production of steam for heating and fluidifying fuel oil before its transfer to destination.

Water requirements for industrial uses do not include the water used for open-cycle cooling of thermal power plants, because it is returned to the original water body with negligible chemical changes and minimum temperature variations (always within the limits mandated by law).

The data show:

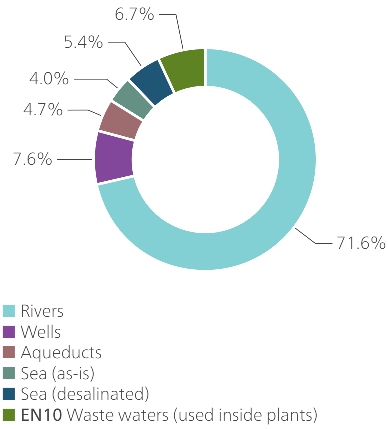
> the gradual decrease of requirements from 2008 (year from which Enel's assets may be regarded as constant) to date;

> the strong contribution of sea water (9.4%) and of surface water, thanks to their use in: closed-cycle cooling systems of nuclear power plants in Slovakia and Spain and in closed-cycle cooling and ash handling systems of thermal power plants in Slovakia and Russia (in the latter case only for ash handling);

> the high recovery of waste waters, which cover a substantial part of requirements (6.7%).

Coverage of water requirements for industrial uses in 2011

Total: 191 million m^3



EN1 Expendables

Expendables, used mainly in thermal and nuclear power plants and in geothermal drilling, complete the list of resources.
The following are the chief ones and their most common uses.

> Resins are used to produce (via ion exchange) the high-purity water needed for the thermal cycle of steam-cycle and nuclear power plants.

> Hydrazine, carbohydrazide and hydrogen peroxide are used for deoxygenation and pH balancing of thermal-cycle water and steam.

> Ammonia, too, is used to balance the pH of the thermal-cycle water, but above all as a reagent in the flue-gas denitrification process.

> Limestone is the reagent for the flue-gas desulfurization process.

> Magnesium oxide is injected into the flue-gas circuits of thermal plant boilers that are fed with vanadium-containing fuel, in order to prevent corrosion of heat-transfer surfaces due to the indirect action of vanadium.

> Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate are occasionally added to the cooling waters of steam-cycle power plants to prevent deposits and fouling or to protect condenser tube surfaces from corrosion.

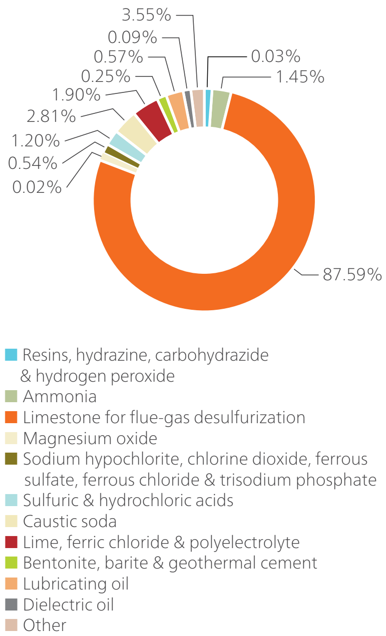
> Lime, ferric chloride and polyelectrolyte are mainly used in waste water treatment, thanks to their neutralizing and/or flocculating properties.

> Sulfuric acid, hydrochloric acid and caustic soda are most commonly used in the regeneration of ion-exchange resins and in the clean-up of equipment, but also in waste water treatment. In geothermal activities, soda has various applications, including as an additive in the slurries used in the drilling of wells.

> Bentonite is a type of clay used as a slurry for the drilling of geothermal wells.

Expendables in 2011

Total: 1,266 thousand t



> Barite is used in some cases to thicken bentonite slurries, thereby improving their effectiveness when drilling into mechanically-unstable rock formations.
> Geothermal cement is used for joining the steel walls of new wells and for permanent plugging of no longer used wells.
> Printing paper is used in different formats in office activities. An increasing share of this paper derives from processes of recycling of used paper.
> "Other" expendables (antifouling, defouling, deoxidizing, antifoam, detergent and antifreezing agents, carbon dioxide, bottled hydrogen, etc.), just as lubricating oil and dielectric oil, are used in the generality of installations.

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

A number of factors make it extremely difficult to interpret the trends of most of the expendables at aggregated level: plurality of business/lines of activities, multiple uses of many materials, variety of installation configurations and the fact that the consumption of some products is often independent of the basic operating parameters of the installations involved. Limestone is an exception. Together with ammonia, it plays a key role among expendables. However, unlike ammonia, limestone has a single use: in the flue-gas desulfurizers which are installed in coal-fired power plants of larger size. This material is acquired, among others, from the paper industry (which produces a large amount of calcareous slurries) and recycled within the Group.

Recycling of materials (%)

	2007	2008	2009	2010	**2011**
Sulfuric acid (1)				0.7	0,4
Lime for flue-gas desulfurization (2)			1.1	1.3	0,4
Printing paper (3)	45	50	52.2	56	54.4
Ferric chloride (4)				0.5	0.7
Dielectric oil (5)	6.8	17.8	11.5	59	20
Lubricating oil (6)			1.1	3	3.5

(1) Brine (by-product of the process of production of demineralized water via osmosis) used in place of sulfuric acid.
(2) Lime (slurries from the paper industry) reused in flue-gas desulfurization.
(3) Paper containing 75% recycled fibers, purchased in the market.
(4) Sludges from waste water treatment, reused in place of ferric chloride in water treatment.
(5) Dielectric oil, decontaminated from PCBs and reused or filtered and reused.
(6) Lubricating oil, filtered and reused.

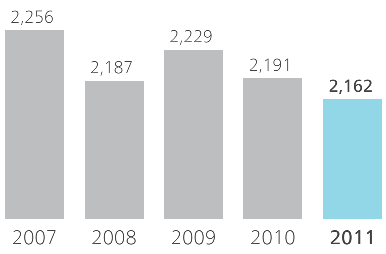
EN1 Survey of PCBs contained in equipment

The survey makes it possible to identify the amounts of oil with a PCB content of over 500 ppm or between 50 and 500 ppm, contained in transformers and equipment. The related trends are affected by the progressive participation of the various countries in this activity (ended in 2010). The decrease recorded in 2011 is justified by replacement and disposal of equipment containing oil with PCBs.

Key Performance Indicators (KPIs)

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	2,256	2,187	2,229	2,191	2,162	-4.20	-1.30
EN1 EN3 Net heat rate of thermal generation (CHP)	kcal/kWh	2,684	2,204	2,151	2,182	2,162	-19.4	-0.900
EN1 EN3 Net heat rate of geothermal generation	kcal/kWh	5,729	5,724	6,022	6,422	6,234	8.80	-2.90
EN1 EN3 Net efficiency of hydro generation from pumped storage	%	72.4	72.6	77.7	77.4	68.8	-5.00	-11.1
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.141	0.106	0.101	0.103	0.138	-1.40	34.0
EN1 EN3 Consumption of natural gas for distribution grid operation	% of natural gas distributed	0.156	0.137	0	0	0	-100	0
Natural gas losses along the grid	% of natural gas distributed	0.650	0.650	0	0	0	-100	0
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.958	0.913	0.929	0.912	0.762	-20.5	-16.4
excluding contribution of as-is sea water	liters/kWh	0.822	0.803	0.856	0.837	0.699	-15.0	-16.5
EN8 Net specific requirements of water for industrial uses in thermal generation (CHP)	liters/kWh	3.70	1.93	1.23	0.989	0.900	-75.7	-9.00
EN8 Net specific requirements of water for industrial uses in nuclear generation	liters/kWh	0.04	0.053	0.065	0.051	0.072	80.0	41.2
EN8 Net specific requirements of water for industrial uses in nuclear generation (CHP)	liters/kWh	3.11	3.02	2.95	2.88	2.93	-5.80	1.70
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	72.9	73.9	72.7	67.9	72.3	-0.800	6.50
from wells	% of requirements	4.55	4.79	5.97	6.38	6.66	46.4	4.40
from aqueducts	% of requirements	4.79	4.23	5.08	4.55	4.71	-1.70	3.50
Total from inland waters	**% of requirements**	**82.2**	**83.0**	**83.7**	**78.8**	**83.6**	**1.70**	**6.10**
from the sea (as-is)	% of requirements	8.69	6.19	4.03	4.22	4.13	-52.5	-2.10
from the sea (desalinated)	% of requirements	4.66	3.62	4.35	4.93	5.45	17.0	10.5
EN10 from waste waters (used inside plants)	% of requirements	4.44	7.24	7.91	12.0	6.76	52.3	-43.7
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	10.3	8.78	8.49	7.31	6.02	-41.6	-17.6
gas oil	% of total fuel consumption	2.36	4.90	5.41	4.64	3.59	52.1	-22.6
natural gas	% of total fuel consumption	32.9	35.9	34.9	38.8	38.0	15.5	-2.10
coal	% of total fuel consumption	46.4	44.0	45.7	43.3	48.6	4.70	12.2
brown coal	% of total fuel consumption	8.06	6.45	5.45	5.94	3.81	-52.7	-35.9
HS fuel oil	% of total fuel oil consumption	2.06	0.202	0.210	0.158	0	-100	-100
MS fuel oil	% of total fuel oil consumption	7.89	12.2	9.71	8.90	5.91	-25.1	-33.6
LS fuel oil	% of total fuel oil consumption	39.2	58.9	69.2	81.6	85.9	119	5.30
VLS fuel oil	% of total fuel oil consumption	50.8	28.7	20.9	9.33	8.20	-83.9	-12.1
natural gas, technologically captive use	% of total natural gas consumption	70.6	61.8	52.7	54.8	57.8	-18.1	5.50
of which in combined-cycle units	*% of total natural gas consumption*	*62.4*	*57.5*	*48.9*	*50.6*	*53.2*	*-14.7*	*5.10*
natural gas, non-technologically captive use	% of total natural gas consumption	29.4	38.2	47.3	45.2	42.2	43.5	-6.60
Geothermal fluid for electricity generation	% of total geothermal fluid extracted	99.5	97.4	97.9	98.3	98.0	-1.50	-0.300

Net heat rate of simple thermal generation (kcal/kWh)



EN1 EN3 The **net heat rate of simple thermal generation** defines the average quantity of fuels (expressed here in terms of energy) consumed by thermal power plants to generate 1 kWh net. In the past few years, its trend in the overall Group and in the individual countries was the result of opposite effects: the growing amount of electricity absorbed by systems abating emissions into the atmosphere; the entry into operation of new high-efficiency combined-cycle power plants (in Italy and Spain); the full consolidation of Endesa in 2009; and initiatives of improvement of the efficiency of thermal power plants undertaken over the years.
Its value in 2011 was 30 kcal/kWh lower than the one of 2010.

EN1 EN3 The **net heat rate of thermal combined heat & power generation (CHP)** defines the average quantity of fuels (expressed here in terms of energy) consumed by thermal CHP plants to generate 1 kWh net (i.e. from generation of both electricity and heat, expressed in kWh).
In this case, the value was down by roughly 20 kcal/kWh on 2010.

As regards fossil-fired thermal power generation, policies of improvement of plant efficiency (see § "EN5 EN6 EN7 Energy efficiency") decreased total energy consumption from 2010 to 2011 by about 3,574 Tcal, (-29 kcal/kWh for 123,230 GWh of simple thermal generation and -20 kcal/kWh for 45,020 GWh of thermal CHP generation), equivalent to 18,732 TJ.

EN1 EN3 The **net heat rate of geothermal generation** defines the average quantity of geothermal steam (expressed here in terms of energy) used by geothermal power plants to produce 1 kWh net.
In the calculation, the residual energy content of the fluid used for supply of heat (fluid becoming available after expansion in the geothermal unit equipped with an atmospheric-exhaust turbine) is subtracted from the energy content of the endogenous fluid.
The increase in this rate is due to the natural decline of geothermal field pressure over time.

EN1 EN3 The **net heat rate of nuclear generation (simple and CHP)** is obtained from the energy content of the steam used to generate 1 kWh net and 1 kWh eq net, respectively.

EN1 EN3 The **net efficiency of hydro generation from pumped storage** expresses, in percentages, the ratio of net electricity generated by pumped-storage hydro power plants to electricity consumed for pumping.

EN4 The **consumption of electricity for grid operation** is expressed as a percentage of the total amounts distributed.

EN8 The **net specific requirements of water for industrial uses in simple thermal generation** express the amount of water consumed per kWh thermal net.
Thanks to water-saving policies, these requirements continued to drop in 2011.

EN8 The **net specific requirements of water for industrial uses in thermal combined heat & power generation (CHP)** express the amount of water consumed per kWh thermal net.
Thanks to water-saving policies, these requirements continued to drop in 2011.

EN8 The **net specific requirements of water for industrial uses in nuclear generation** express the amount of water consumed per kWh nuclear net.
In 2011, these requirements went up as a result of fuel reloading in all the Spanish plants and of the installation of a flow meter in the Ascó plant; therefore, the requirements of the latter plant were higher than those recorded in previous years.

EN8 The **net specific requirements of water for industrial uses in nuclear combined heat & power generation (CHP)** express the amount of water consumed per kWh nuclear net.
In 2011, these requirements grew owing to the overall increase of heat & power generation.

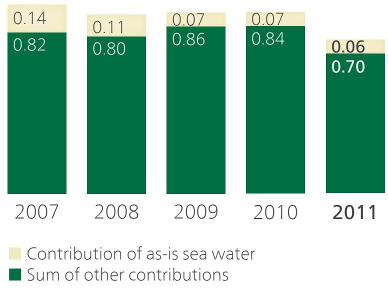
EN8 The **coverage of requirements of water for industrial uses** expresses the percentage contribution of the different water sources (inland waters, sea water, waste waters).
The total contribution of inland waters (rivers, wells and aqueducts) went up owing to a decrease in the use of waste waters.

EN10 It is worth stressing that, in some cases, waste waters may be unsuitable for reuse, which would require frequent clean-up and maintenance of the served loads. In these cases, reuse is avoided, with a consequent decrease in the amount of reusable waste waters.

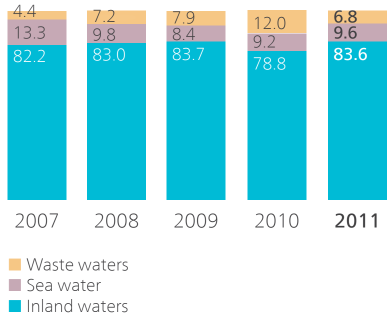
EN3 The **fossil fuel mix** (see § "Fuels") highlights an increase in the use of coal.

EN3 The **share of endogenous fluid used for electricity generation** accounts for the near totality of the fluid extracted.

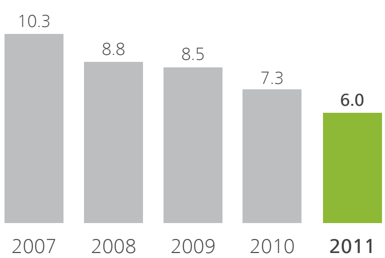
Net specific requirements of water for industrial uses in simple thermal generation (liters/kWh)



Coverage of requirements of water for industrial uses (%)



Relative consumption of fuel oil (% of total consumption of fossil fuels for thermal generation)



Processes and products

Absolute values

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels	**million kWh**	**92,243**	**145,798**	**159,006**	**156,072**	**168,250**
simple	million kwh	88,701	118,830	117,290	110,671	123,230
fuel oil & gas oil	*million kWh*	*10,858*	*18,732*	*20,601*	*18,074*	*16,977*
natural gas	*million kWh*	*36,156*	*48,282*	*42,959*	*45,249*	*45,983*
of which in combined-cycle units	million kWh	25,625	40,850	37,729	40,132	41,025
coal	*million kWh*	*38,033*	*46,335*	*48,238*	*41,706*	*56,707*
brown coal	*million kWh*	*3,655*	*5,481*	*5,492*	*5,642*	*3,563*
combined with heat generation	million kwh	3,541	26,968	41,716	45,401	45,020
fuel oil & gas oil	*million kWh*	*240*	*118*	*119*	*59.6*	*90.5*
natural gas	*million kWh*	*184*	*12,257*	*19,176*	*21,153*	*22,676*
coal	*million kWh*	*1,693*	*12,953*	*20,780*	*22,549*	*20,517*
brown coal	*million kWh*	*1,424*	*1,640*	*1,640*	*1,639*	*1,738*
From waste (non-biodegradable fraction)	**million kWh**	**28.8**	**21.2**	**51.9**	**30.8**	**39.4**
From hydrogen	**million kWh**	**0**	**0**	**0**	**2.17**	**0.275**
From renewables	**million kWh**	**36,514**	**64,989**	**85,682**	**86,898**	**79,906**
biomass and biodegradable fraction of waste	million kWh	260	308	491	553	641
simple	*million kWh*	*84.5*	*135*	*334*	*351*	*443*
combined with heat generation	*million kWh*	*175*	*172*	*157*	*202*	*198*
geothermal	million kWh	5,292	5,218	5,150	5,278	5,568
hydro from natural flows	million kWh	29,020	55,505	75,621	75,971	67,368
wind	million kWh	1,941	3,955	4,392	5,069	6,274
solar (photovoltaic)	million kWh	1.34	2.94	27.8	27.0	56.2
Hydro from pumped storage	**million kWh**	**6,473**	**6,228**	**5,890**	**5,127**	**2,965**
Nuclear generation	**million kWh**	**15,528**	**29,672**	**35,685**	**41,153**	**39,517**
simple	million kWh	4,132	17,508	22,630	27,620	25,177
combined with heat generation	million kWh	11,395	12,164	13,055	13,534	14,340
Total	**million kWh**	**150,786**	**246,708**	**286,314**	**289,284**	**290,678**
simple	million kWh	135,674	207,404	231,386	230,147	231,120
combined with heat generation	million kWh	15,112	39,303	54,927	59,137	59,558
Electricity consumption for pumping	million kWh	8,939	8,581	7,580	6,628	4,312
Available generation	million kWh	141,847	238,127	278,734	282,655	286,366

		2007	2008	2009	2010	2011
Useful heat output (combined with power generation)						
In thermal power plants	million kcal	655,135	4,621,536	7,338,791	7,017,506	7,616,600
fossil fuels	million kcal	625,509	4,591,387	7,315,748	6,984,982	7,582,254
biomass and biodegradable fraction of waste	million kcal	29,626	30,149	23,042	32,524	34,346
In nuclear power plants	million kcal	454,001	478,592	541,146	596,857	527,923
Total	**million kcal**	**1,109,136**	**5,100,128**	**7,879,937**	**7,614,363**	**8,144,523**
	million kWh	**1,290**	**5,931**	**9,164**	**8,856**	**9,472**
Fuel storage & handling						
Fuel transferred to destination	t	58,295	42,282	10,144	4,510	15,216
Heat generation	million kcal	3,858	8,700	8,700	6,769	4,550
Geothermal drilling						
Extent	m	15,225	14,718	27,816	15,498	19,214
Electricity distribution						
Electricity distributed	million kWh	299,169	398,017	417,851	430,558	509,660
EN4 Electricity consumption for grid operation	million kWh	422	423	421	442	600
Natural gas distribution						
Natural gas distributed	million m^3	3,418	3,570	442	0	0
Natural gas consumption for grid operation	million m^3	5.32	4.90	0	0	0
Natural gas losses along the grid	million m^3	22.2	23.2	0	0	0
Mining & extracting activities (1)						
Mining activities						
Fuel extracted in the reporting year	million t		1.38	1.90	1.84	1.01
Areas restored in the year (geomorphology, hydrogeology and landscape)						
Areas revegetated with plant, shrub and tree species	ha		69.9	23.1	0	283
Areas occupied by water bodies	ha		157	234	0	74.0
Areas restored since the start of activities (geomorphology, hydrogeology and landscape)						
Areas revegetated with plant, shrub and tree species	ha		1,532	2,287	2,904	3,345
Areas of high landscape-cultural value	ha		88.7	132	132	139
Areas occupied by water bodies	ha		198	509	509	1,042
Areas occupied by infrastructure (roads, canals, aqueducts, power lines)	ha		65.7	97.9	92.1	95.0
Areas awaiting final restoration	ha		168	271	207	1,550

(1) These activities have been surveyed since 2008.

		2007	2008	2009	2010	2011
Sales (1)						
Open market						
Residential segment						
Green offerings						
Customers	no.	0	673,370	1,364,507	1,581,542	2,105,968
Power sold	million kWh	0	1,290	3,032	5,258	6,138
Time-of-use offerings						
Customers	no.	37,492	224,450	187,943	286,920	232,004
Power sold	million kWh	17.0	512	868	781	676
Total						
Customers	no.	233,648	902,126	1,703,764	2,454,591	2,867,588
Power sold	million kWh	106	2,345	4,322	6,657	8,370
Business segment						
Green offerings						
Customers	no.	196,181	204,024	367,527	407,884	190,630
Power sold	million kWh	1,063	3,230	3,950	5,901	3,874
Time-of-use offerings						
Customers	no.	18,305	168,370	569,217	690,075	862,021
Power sold	million kWh	6,316	17,603	16,786	17,227	17,524
Total						
Customers	no.	962,753	996,425	1,063,456	1,134,254	1,105,714
Power sold	million kWh	19,885	27,705	29,580	24,559	23,022
Large customers' segment						
Green offerings						
Customers	no.	6	16	7,925	5,612	654
Power sold	million kWh	0.141	80.0	986	126	94.1
Time-of-use offerings						
Customers	no.	3,635	27,441	38,115	46,518	46,851
Power sold	million kWh	7,693	8,054	8,088	7,419	5,615
Total						
Customers	no.	21,356	31,534	52,545	58,720	51,173
Power sold	million kWh	8,624	9,427	10,290	8,960	7,916
Very large customers' segment						
Total						
Customers	no.	99.0	101	134	119	67.0
Power sold	million kWh	13,543	15,390	30,471	25,771	25,765
Universal-service market						
Household customers' segment						
Time-of-use offerings						
Customers	no.	689,740	168,012	187,982	7,126,590	19,722,959
Power sold	million kWh	2,758	594	617	17,312	44,927
Total						
Customers	no.	23,816,519	24,816,711	25,135,660	24,313,927	23,304,781
Power sold	million kWh	52,952	54,071	53,082	50,656	51,864
Non-household customers' segment						
Time-of-use offerings						
Customers	no.	316	5,696	3,091,587	3,855,927	3,856,615
Power sold	million kWh	24.5	263	18,245	20,212	22,481
Total						
Customers	no.	5,473,851	4,824,492	4,607,488	4,458,415	4,318,693
Power sold	million kWh	34,743	26,914	26,767	25,209	26,265
Overall power sold						
high-voltage	million kWh	18,418	17,991	33,266	26,220	26,583
medium-voltage	million kWh	22,069	21,709	22,202	18,292	14,522
low-voltage	million kWh	101,420	113,781	112,372	109,443	104,232
Total	**million kWh**	**141,907**	**153,481**	**167,841**	**153,955**	**145,337**
Total RECS certificates canceled	**no. (MWh)**	**1,066,000**	**4,600,000**	**7,968,119**	**11,148,877**	**10,106,362**

(1) These activities have been surveyed since 2007.

Enel's activities are today focused on electricity generation and electricity and gas distribution. Other activities include geothermal drilling, fuel storage & handling, mining, electricity sales, as well as service and real-estate management.

Electricity generation

With regard to electricity generation, it is worth pointing out that:

> the various contributions are net of the electricity consumed by power plant auxiliaries and of losses in the main transformers (net generation);

> the above-mentioned net generation does not necessarily match the amount of electricity sold posted in the Consolidated Financial Statements; the latter value is measured further ahead (and thus affected by grid losses) and is gross of the electricity consumed by some auxiliaries (medium-voltage auxiliaries in some dams, start-up auxiliaries in thermal power plants, etc.);

> generation from RDF (refuse-derived fuel) is distinguished into: i) the one obtained from the non-biodegradable fraction of waste; and ii) the one obtained from the biodegradable fraction of waste and regarded as generation from renewables;

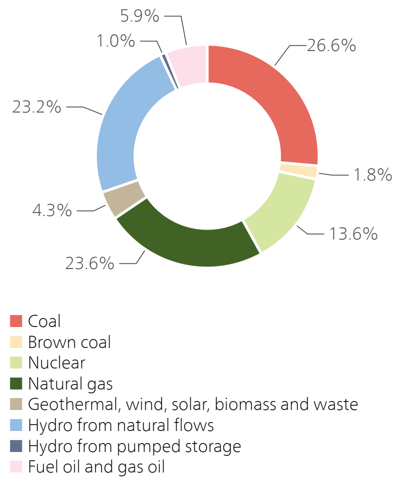
> hydro generation from pumped storage is the electricity that is produced, in peak-load hours, through the falling of water previously pumped from a lower reservoir to an upper reservoir, using electricity surpluses arising in low-load hours (pumped storage is the only available option for storing significant amounts of electricity, albeit indirectly);

> combined heat & power generation (CHP) takes place simultaneously in both thermal and nuclear power plants;

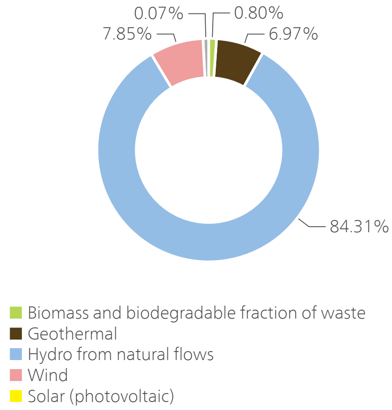
> actually available generation is the overall net generation, i.e. after deducting the electricity consumed for pumping.

In 2011, total available electricity generation slightly rose, because the increase in thermal generation was higher than the decrease in nuclear and hydro generation.

Net electricity generation (simple and CHP) by source in 2011
Total: 291 TWh



Net electricity generation from renewables in 2011
Total: 79.9 TWh



EN4 Electricity distribution

The typical data of this activity are the electricity wheeled on the distribution grid and the own consumption of electricity.
The former is the overall electricity delivered to end users connected to the grid.
Own consumption is the consumption of electricity required for the operation of the grid.

Fuel storage & handling

This activity, which is carried out far from thermal plant sites, is aimed at storing and handling fuels:

> liquid fuels: oil and gas oil storage tanks and pipelines;
> solid fuels: coal and brown-coal bunkers located in dedicated port terminals.

The amounts of product transferred to destination and of heat generation only refer to fuel oil, which may be carried via pipelines and which needs heat for fluidification.
For this activity, the Eco-Balance shows, in particular, the use of resources, the consumption of primary energy, the consumption of electricity and the production of emissions, liquid releases and waste.

Geothermal drilling

This activity is aimed at making available endogenous fluid for geothermal power generation.
Geothermal drilling involves the use of technologies and know-how in which Enel is a worldwide leader.
The extent of yearly drilling represents, in some way, the volume of activity. Nevertheless, it should be emphasized that operating conditions – and thus consumption of energy and expendables and production of waste and residues – may vary significantly, depending on the nature of the rock formations that are crossed.

Mining & extracting activities

These activities are carried out in the mines from which coal and brown coal are extracted.
The Eco-Balance shows not only the extractable amount of fuel (among the "Status data") but also the activities of geomorphological, hydrogeological and landscape restoration.
In particular, the Eco-Balance displays the use of resources, the consumption of primary energy, the consumption of electricity and the production of emissions, liquid releases and waste.

Sales

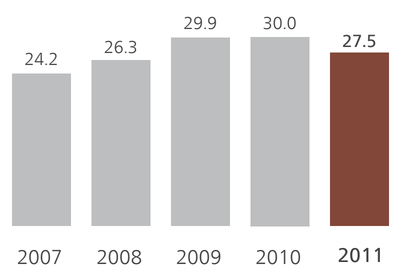
This is the activity of sale of both green power and time-of-use power, which has positive effects on the environment:

> in the case of green rate plans, customers pay a small extra amount to finance the development of renewables;
> time-of-use rate plans shift electricity demand to off-peak hours (lower number of thermal power plants, higher generating efficiency and lower grid losses thanks to the shorter distance between generation and consumption).

Real-estate & service management

This activity refers to the management of the vehicle fleet and of buildings.
The typical data of this activity are fuel consumption, uses of water and resources and production of waste.

Electricity generation from renewables vs. total electricity generation (%)



Key Performance Indicators (KPIs)

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN6 Electricity generation from renewables								
Thermal from biomass & biodegradable fraction of waste	% of total generation	0.172	0.125	0.171	0.191	0.220	27.9	15.2
Geothermal	% of total generation	3.51	2.12	1.80	1.82	1.92	-45.3	5.50
Hydro from natural flows	% of total generation	19.2	22.5	26.4	26.3	23.2	20.8	-11.8
Wind and solar (photovoltaic)	% of total generation	1.29	1.60	1.54	1.76	2.18	69.0	23.9
Total	**% of total generation**	**24.2**	**26.3**	**29.9**	**30.0**	**27.5**	**13.6**	**-8.30**
EN6 Sales								
Residential segment								
Green power sold	% of power sold	0	55.0	70.2	79.0	73.3	0	-7.20
Time-of-use power sold	% of power sold	16.0	21.8	20.1	11.7	8.08	-49.5	-30.9
Business segment								
Green power sold	% of power sold	5.35	11.7	13.4	24.0	16.8	214	-30.0
Time-of-use power sold	% of power sold	31.8	63.5	56.7	70.1	76.1	139	8.60
Large customers' segment								
Green power sold	% of power sold	0.002	0.849	9.58	1.41	1.19	59,400	-15.6
Time-of-use power sold	% of power sold	89.2	85.4	78.6	82.8	70.9	-20.5	-14.4
Household customers' segment								
Time-of-use power sold	% of power sold	5.21	1.10	1.16	34.2	86.6	1,562	153
Non-household customers' segment								
Time-of-use power sold	% of power sold	0.070	0.977	68.2	80.2	85.6	122,186	6.70
Overall power sold								
high-voltage	% of power sold	13.0	11.7	19.8	17.0	18.3	40.8	7.60
medium-voltage	% of power sold	15.6	14.1	13.2	11.9	9.99	-36.0	-16.1
low-voltage	% of power sold	71.5	74.1	67.0	71.1	71.7	0.300	0.800
Total green power sold	**% of power sold**	**0.749**	**3.00**	**4.75**	**7.33**	**6.95**	**828**	**-5.20**
Total time-of-use power sold	**% of power sold**	**11.8**	**17.6**	**26.6**	**40.9**	**62.8**	**432**	**53.5**
Mining & extracting activities (1)								
Yield of the site (open-pit mine)	million m^3 of moved soil/million t of extracted mineral		4.68	5.34	3.69	2.6	0	-29.5
Percentage of moved soil used to restore the area	%		0	0	2.42	2.33	0	-3.70

(1) These activities have been surveyed since 2008.

> EN6 **Electricity generation from renewables**, expressed as a percentage of total electricity generation, had a contraction of nearly 3 percentage points in 2011 owing to the reduction of hydro generation.

> EN6 **Green power sold**, expressed as a percentage of total power sold to each customer segment of the open market (residential, business and large customers), fell in 2011 vs. 2010.

> EN6 **Time-of-use power sold**, expressed as a percentage of total power sold to each customer segment (open market: residential, business and large customers; universal-service market: household and non-household customers), increased in 2011 vs. 2010.

Emissions

Absolute values

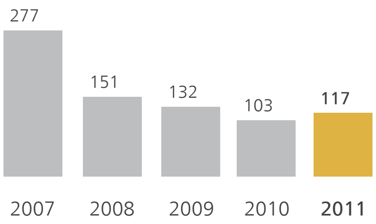
	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	277	151	132	103	117
	thermal generation (CHP)	thousand t	33.2	117	156	184	164
	Total	**thousand t**	**310**	**267**	**288**	**287**	**281**
EN20 NO_X (scope 1)	thermal generation	thousand t	91.5	149	163	127	150
	thermal generation (CHP)	thousand t	6.55	55.0	98.8	125	109
	fuel storage & handling	thousand t	0.001	0.002	0.002	0	0.001
	Total	**thousand t**	**98.0**	**204**	**261**	**251**	**259**
EN20 Particulates	thermal generation	thousand t	10.8	7.17	8.43	6.68	6.30
	thermal generation (CHP)	thousand t	0.828	94.2	120	148	104
	Total	**thousand t**	**11.6**	**101**	**129**	**155**	**110**
EN16 CO_2 (scope 1)	*fossil-fired thermal generation (from combustion)*	*thousand t*	*66,203*	*86,498*	*86,759*	*78,512*	*87,098*
	fossil-fired thermal generation (from desulfurization)	*thousand t*	*192*	*586*	*411*	*401*	*401*
	Total from fossil-fired thermal generation	thousand t	66,395	87,084	87,170	78,913	87,499
	non-fossil-fired thermal generation (from fossil carbon)	thousand t	23.3	16.2	39.7	33.1	40.3
	Total from thermal generation	thousand t	66,419	87,100	87,210	78,946	87,540
	fossil-fired thermal generation (CHP) (from combustion)	*thousand t*	*4,332*	*23,327*	*34,732*	*37,066*	*35,650*
	fossil-fired thermal generation (CHP) (from desulfurization)	*thousand t*	*34.1*	*37.3*	*37.6*	*35*	*39.4*
	Total from thermal generation (CHP)	thousand t	4,367	23,364	34,770	37,101	35,689
	Various activities	thousand t	85.5	144	166	143	122
	Total	**thousand t**	**70,871**	**110,609**	**122,146**	**116,191**	**123,351**

	Source		2007	2008	2009	2010	2011
EN16 SF_6	electricity generation	kg	2,103	2,282	1,378	1,619	2,729
		thousand t of CO_2 equivalent	48.0	52.0	31.4	36.9	62.2
	electricity distribution	kg	3,109	3,781	4,649	4,678	4,659
		thousand t of CO_2 equivalent	70.9	86.2	106	107	106
	Total	**kg**	**5,212**	**6,064**	**6,027**	**6,297**	**7,388**
		thousand t of CO_2 equivalent	**119**	**138**	**137**	**144**	**168**
EN16 CH_4	gas distribution, mining & extracting activities	thousand t	14.8	16.6	1.57	1.52	0.837
		thousand t of CO_2 equivalent	370	415	39.3	38.0	20.9
EN16 **Total greenhouse gases (CO_2, SF_6, CH_4)**		**thousand t of CO_2 equivalent**	**71,360**	**111,162**	**122,323**	**116,372**	**123,540**
EN20 H_2S	geothermal generation (fluid)	thousand t	16.2	13.1	10.2	10.4	9.17
EN16 CO_2	geothermal generation (fluid)	thousand t	1,953	1,902	1,876	1,829	1,804
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows		thousand t	21,561	44,122	56,680	52,609	46,785
Due to geothermal generation		thousand t	3,682	3,610	3,861	3,883	4,138
Due to wind and solar generation		thousand t	1,618	3,237	3,610	4,129	5,158
Due to generation from biomass & biodegradable fraction of waste		thousand t	59.0	94.0	372	413	483
Due to generation from hydrogen		thousand t	0	0	0	1.54	0.195
Due to generation from renewables		**thousand t**	**26,920**	**51,063**	**64,520**	**61,035**	**56,564**
Due to nuclear generation		**thousand t**	**17,867**	**29,042**	**34,041**	**36,997**	**36,274**
Total		**thousand t**	**44,787**	**80,106**	**98,561**	**98,033**	**92,839**
EN20 **Radioactive emissions into the atmosphere**							
Noble gases	nuclear generation	TBq	3.10	24.4	24.0	15.2	40.7
	nuclear generation (CHP)	TBq	9.17	6.52	6.56	8.51	10.5
	Total	**TBq**	**12.3**	**30.9**	**30.6**	**23.7**	**51.1**
Iodine 131	nuclear generation	MBq	2.93	158	258	88.8	31.3
	nuclear generation (CHP)	MBq	10.6	0.648	0.556	0.608	0.979
	Total	**MBq**	**13.5**	**158**	**258**	**89.4**	**32.3**
Aerosol β and γ	nuclear generation	MBq	1.87	20,132	18,401	6,567	5,976
	nuclear generation (CHP)	MBq	20.5	18.1	20.8	18.7	16.0
	Total	**MBq**	**22.3**	**20,150**	**18,421**	**6,586**	**5,992**
Aerosol α	nuclear generation	kBq	4.88	35.9	63.7	31.4	39.2
	nuclear generation (CHP)	kBq	26.8	13.7	22.6	6.49	3.58
	Total	**kBq**	**31.7**	**49.7**	**86.3**	**37.9**	**42.8**
Strontium 89 and 90	nuclear generation	kBq	681	2,781	8,482	2,896	1,838
	nuclear generation (CHP)	kBq	183	133	91.5	74.7	64.7
	Total	**kBq**	**864**	**2,914**	**8,573**	**2,971**	**1,903**

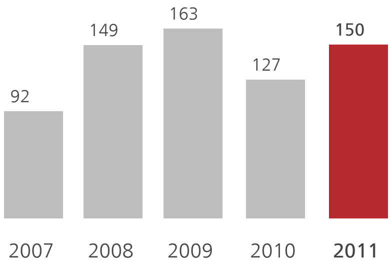
Emissions into the atmosphere

The emissions of some substances into the atmosphere have a polluting effect, while those of other substances contribute to the greenhouse effect.
The emissions into the atmosphere, which are quantitatively most significant and typical of Enel's industrial activities, are as follows: in the first category, sulfur dioxide (SO_2), nitrogen oxides (NO_X) and particulates; and, in the second category, carbon dioxide (CO_2), sulfur hexafluoride (SF_6) and methane (CH_4).

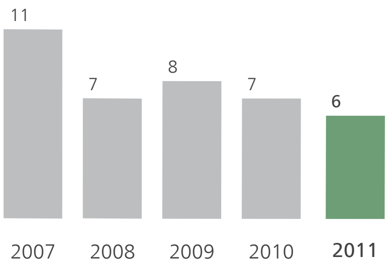
SO_2 emissions from simple thermal generation (thousand t)



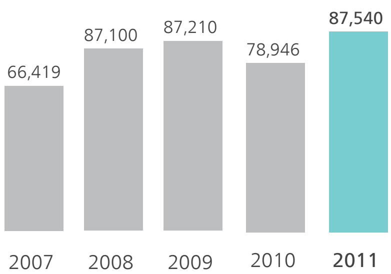
NO_X emissions from simple thermal generation (thousand t)



Particulate emissions from simple thermal generation (thousand t)



CO_2 emissions from simple thermal generation (thousand t)



EN20 SO_2, NO_X and particulates originate from the combustion process and mostly come from thermal and thermal CHP power plants.
SO_2 is abated by desulfurizers in large coal-fired power plants. Emissions of SO_2 may be prevented by using high-grade fuels with low or very low sulfur (LS and VLS).
Emissions of NO_X are controlled through the generalized use of advanced combustion systems (prevention measures) and their constant tuning, whereas post-combustion abatement is based on the installation of denitrification systems in coal- and oil-fired power plants.
Particulates are abated by particulate collection systems – usually based on electrostatic precipitators, but also on more efficient bag filters, which are suitable for coal-fired power plants only – in almost all power plants.
The amounts of emissions are calculated by multiplying their concentrations in the flue gases (generally continuously monitored) by the volumes of the gases. NO_X are expressed in terms of NO_2 equivalent.

EN16 EN17 Greenhouse gas emissions – Scopes 1, 2 and 3

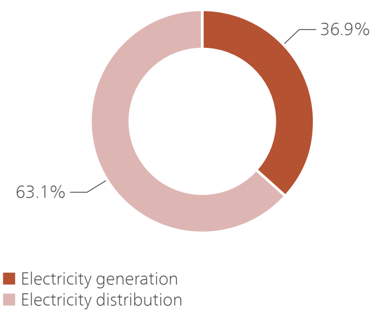
The World Business Council for Sustainable Development (WBCSD) categorizes direct and indirect greenhouse gas (GHG) emissions and their origin into three broad scopes.
Scope 1: all direct GHG emissions from sources that are owned or controlled by the company, e.g. emissions directly resulting from production.
Scope 2: indirect GHG emissions from consumption of purchased electricity, e.g. emissions from the plant where such electricity is generated.
Scope 3: other indirect GHG emissions that are a consequence of the activity of the company, but occur at sources not owned or controlled by the same company, e.g. emissions from extraction of materials or transport of purchased fuels.

EN16 Greenhouse gases, Scope 1: CO_2 is the typical product of combustion and, as such, the near totality of it comes from thermal power plants (simple and CHP). Small amounts – reported here in view of the attention paid to the greenhouse effect – also derive from: geothermal drilling (combustion of gas oil feeding the diesel engines of drilling equipment); emergency generating sets installed in the generality of Enel's installations (combustion of gas oil); fuel storage & handling (use of fuels for producing process steam); and real-estate & service management (combustion of gasoline, natural gas and gas oil).

CO_2 is also contained in the reaction products from the process of desulfurization of the flue gases outgoing from the boilers of some thermal power plants.
Finally, also natural gas distribution contributes to CO_2 emissions: as CO_2 is a minor constituent of natural gas, it is present in the losses from the distribution grid.
Since the implementation of Directive 2003/87/EC (establishing a scheme for greenhouse emission allowance trading), a different procedure has been used for computing CO_2 emissions. For the fuels and installations covered by the scheme (and required to monitor and report their emissions), the calculation is based on analyses (carbon content of the fuel, calorific value, carbon content of ash) conducted on the individual lots of fuel.
In the other cases (fuels and installations not covered by the scheme), Enel uses the reference parameters of the latest national greenhouse gas inventories.
The amount of CO_2 from the desulfurization process is computed stoichiometrically from the amount of limestone used.
It is worth noting that the overall generating mix improved its performance in terms of CO_2 emissions, whose increase was lower than the one of generation (as evidenced by the specific CO_2 emissions from thermal generation, simple and CHP, vs. those from overall net generation of electricity and heat – see, further on, "Key performance indicators"). This is due, in particular, to the effect of policies of improvement of plant efficiency (see "EN5 EN6 EN7 Energy efficiency").
For emissions, Scopes 2 and 3, see page 82.

EN16 SF_6 is used in high- and medium-voltage electrical equipment as an insulant and for electric arc extinction; in these applications, it is irreplaceable. Its emissions into the atmosphere are due to leaks from the above equipment. These emissions are determined with a complex procedure, which takes into account replenishments (difference between the weights of SF_6 contained in the bottles used for replenishment, at the start and end of the year, increased by the weight of SF_6 contained in the bottles purchased or acquired during the year and decreased by the weight of SF_6 contained in the bottles transferred during the year), including those carried out by third parties. In the very rare event of breakage of SF_6-containing equipment, its nominal SF_6 content is considered as leakage.
Given the particular care with which SF_6 is removed from end-of-life equipment, the above procedure provides fairly reliable data.
These emissions are expressed in weight of SF_6 and in weight of CO_2 equivalent, in terms of Global Warming Potential (GWP). The 100-year GWP value that has been used (22,800) is the one specified in the "IPCC Fourth Assessment Report: Climate Change 2007".
When expressed in CO_2 equivalent, the values of SF_6 appear to be extremely low as against Enel's overall greenhouse gas emissions.
At local level, the variability of SF_6 emissions from one year to the other is largely due to the occasional character of the above-mentioned replenishments.

Origin of emissions of SF_6 in 2011
Total: 7,388 kg



EN16 CH_4 comes from:
> coal extraction, since methane is naturally contained in coal seams.

The emissions are determined on the basis of the IPCC emission factors ("2006 IPCC Guidelines for National Greenhouse Gas Inventories"). These factors, which are different for surface mining (1.15 m^3/t) and deep mining (17.5 m^3/t), are multiplied by the tonnes of fuel extracted.

The 100-year GWP that has been used (25) is the one specified in the "IPCC Fourth Assessment Report: Climate Change 2007". When expressed in CO_2 equivalent, CH_4 emissions account for a very low share of Enel's overall greenhouse gas emissions.

EN20 With regard to "minor" pollutants (e.g. metals), Enel conducted extensive programs of monitoring of their concentrations in the flue gases released by its thermal power plants, under different conditions of types of fuel and abatement systems. The results indicate that these concentrations comply – with wide margins – with the point-source limits of emissions indicated by the national legislation of the countries where Enel operates.

Separate considerations should be made about the gases contained in geothermal steam. As such gases are incondensable, they are emitted into the atmosphere when steam condenses after expansion in turbines.

These gases are:

EN20 EN16

> hydrogen sulfide (H_2S), the only potentially polluting substance (offensive odor) which is present in significant amounts in geothermal fluid;

> carbon dioxide (CO_2).

A wide debate is underway on the natural or anthropogenic origin of these gaseous emissions.

The International Geothermal Association supports their natural origin: as spontaneous emissions are present in diffuse form in geothermal areas, geothermal power plants only convey them in concentrated form, thereby reducing natural ones.

The IPCC Guidelines for national greenhouse inventories do not include CO_2 emissions from geothermal generation among those to be censused. However, Italy included these CO_2 emissions in its national reports on greenhouse gas emissions.

In this Environmental Report, CO_2 and H_2S emissions from geothermal generation are reported for the sake of information completeness.

Their values are estimated on the basis of periodical analyses and measurements of the composition and flow rate of geothermal steam used by power plants.

Thanks to the growing use of abatement systems, H_2S emissions are lower than those that would be naturally present in geothermal areas without geothermal power plants.

In line with the IPCC Guidelines, the Eco-Balance does not report the emissions of CO_2 from the share of thermal generation obtained from biomass and from the biodegradable fraction of RDF (containing non-fossil carbon). Indeed, these emissions counterbalance the CO_2 that biomass (organic component of waste or used on as-is basis) absorbs during its growth.

However, CO_2 emissions from combustion of the non-biodegradable fraction (containing fossil carbon) of RDF are reported.

EN18 Avoided CO_2 emissions

Avoided CO_2 emissions are an indicator of the environmental benefits arising from the mix of resources used for production processes and from the efficiency of the full cycle, going from utilization of the resources to end uses of the various products.

The tables show the CO_2 emissions that the Enel Group avoided thanks to renewable and nuclear generation, rather than from the otherwise necessary fossil-fired thermal generation.

These emissions are determined by multiplying the electricity generation from each renewable or nuclear source by the average specific CO_2 emissions from fossil-fired thermal power plants in the various countries where the Group is present. Failing thermal power plants, reference is made to the national average specific emissions of Enerdata's database (http://services.enerdata.eu).

Overall avoided emissions are calculated as the sum of the emissions avoided in the various geographic areas.

In the case of hydro power, reference is made only to generation from natural flows, excluding the contribution of pumped-storage power plants.

In 2011, the overall Group avoided about 93 million tonnes of CO_2 emissions (about 57 million tonnes thanks to electricity generation from renewables and roughly 36 thanks to nuclear generation). The percentage ratio of the overall CO_2 emissions that Enel avoided thanks to generation from renewables to those which would have been produced by electricity generation activities, failing the contribution of renewables [avoided CO_2/(actual CO_2 + avoided CO_2)], exceeded 31%. If also the contribution of nuclear generation is considered, then this percentage reaches 43%.

EN20 Radioactive emissions into the atmosphere (nuclear generation)

Nuclear fission produces unstable (radioactive) isotopes, which turn into stable isotopes – also through subsequent decays – and release energy in the form of radiation with different properties and penetrating power.

"Activity" is defined as the number of disintegrations of a given amount of radioactive material per unit time. It is measured in Becquerel (Bq): 1 Bq = 1 disintegration per second. When the activity refers to contamination on a given surface, it is expressed in Bq per unit surface area (Bq/cm^2). When it refers to volume (e.g. contamination of air or water), it is expressed in Bq per unit volume (Bq/cm^3). Likewise, in the case of contamination of matrices, such as soil, food, etc., reference is made to activity per unit mass (Bq/kg). As the Becquerel is a very small unit of measurement, radioactivity is very often indicated in multiples of Becquerel.

Radioactive decays produce alpha and beta radiation, consisting of electrically charged particles, as well as gamma radiation, consisting of electromagnetic waves, which are also present in nature owing to natural radioactivity.

Alpha particles (helium nuclei) are relatively heavy and slow and have a low penetrating power, so that they can be blocked by less than 10 cm of air or merely by a sheet of paper.

Beta particles (electrons) are lighter and faster and their penetrating power is higher than the one of alpha particles; however, this power is so small that the particles can be blocked by a thin metal sheet: a few millimeters can stop them, whereas in air a few meters would be needed.

Gamma radiation is more penetrating and energetic and is stopped only by a thick layer of concrete, lead or steel.

Under normal operating conditions, the emissions of a nuclear power plant, mainly from the degassing units of the primary circuit, flow to the chimney stack through the ventilation system of the reactor containment and other buildings. Radioactive discharges are subject to particularly strict limits that are set by the competent authorities taking into account environmental susceptibility. They are expressed in terms of: i) dose commitments to the persons supposedly most exposed ("critical group"); in this case, they are lower by many orders of magnitude than the contribution due to natural radioactivity; and ii) dose limits to the population; in this case, their values are practically insignificant.

The total activity of the discharged radioactive aerosols and gases is continuously monitored at the stack of the plant.

The following isotopes are usually detected and included in the discharge limits:

> Noble gases: Ar41, Kr85, Kr85m, Kr87, Kr88, Xe133, Xe133m, Xe135;
> Iodine 131;
> Alpha aerosols (alpha emitters): Pu238, Pu239+Pu240, Am241;
> Beta aerosols (beta emitters): Sr89, Sr90;
> Gamma aerosols (gamma emitters): Cr51, Mn54, Co57, Co58, Fe59, Co60, Zn65, Nb95, Zr95, Mo99, Ru103, Rh106, Ag110m, Sb122, Sb124, Cs134, Cs137, Ce141, Ce144;
> Tritium and C14.

The abnormal values of radioactive emissions into the atmosphere in 2008 and 2009 (Iodine 131, Sr89, Sr90, beta and gamma aerosols) is due to the replacement of fuel rods in all of the Spanish plants, except for Ascó II.

Key Performance Indicators (KPIs)

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	3.12	1.27	1.12	0.929	0.950	-69.6	2.30
EN20 NO_X (thermal generation)	g/kWh thermal net	1.03	1.25	1.38	1.14	1.21	17.5	6.10
EN20 Particulates (thermal generation)	g/kWh thermal net	0.121	0.060	0.072	0.060	0.051	-57.9	-15.0
EN16 CO_2 (thermal generation)	g/kWh thermal net	748	732	741	711	708	-5.30	-0.400
EN20 SO_2 (thermal generation - CHP)	g/kWh thermal net	7.41	3.59	3.10	3.43	3.03	-59.1	-11.7
EN20 NO_X (thermal generation - CHP)	g/kWh thermal net	1.46	1.69	1.96	2.32	2.01	37.7	-13.4
EN20 Particulates (thermal generation - CHP)	g/kWh thermal net	0.185	2.90	2.38	2.75	1.92	938	-30.2
EN16 CO_2 (thermal generation - CHP)	g/kWh thermal net	975	719	690	690	660	-32.3	-4.30
EN20 SO_2 (total from thermal generation - simple and CHP)	g/kWh total net	2.04	1.06	0.975	0.964	0.937	-54.1	-2.80
EN20 NO_X (total from thermal generation - simple and CHP)	g/kWh total net	0.645	0.806	0.884	0.843	0.862	33.6	2.30
EN20 Particulates (total from thermal generation - simple and CHP)	g/kWh total net	0.076	0.401	0.435	0.519	0.367	383	-29.3
EN16 CO_2 (total from thermal generation - simple and CHP)	g/kWh total net	465	437	413	389	411	-11.6	5.70
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.948	0.687	0.555	0.820	0.940	-0.800	14.6
CH_4+CO_2, expressed as CO_2 equivalent (gas distribution)	g/m^3 of natural gas	111	111	0	0	0	-100	0
EN20 H_2S (geothermal fluid)	g/kWh geothermal net	3.06	2.51	1.98	1.97	1.65	-46.1	-16.2
EN20 CO_2 (geothermal fluid)	g/kWh geothermal net	369	365	364	347	324	-12.2	-6.60
EN20 **Specific radioactive emissions into the atmosphere**								
Nuclear generation								
Noble gases	kBq/kWh	1	1	1	1	2	100	100
Iodine 131	kBq/kWh	1	9	11	3	1	0	-66.7
Aerosol β and γ	mBq/kWh	0	1,150	813	238	237	0	-0.400
Aerosol α	µBq/kWh	1	2	3	1	2	100	100
Strontium 89 and 90	µBq/kWh	165	159	375	105	73	-55.8	-30.5
Nuclear generation (CHP)								
Noble gases	kBq/kWh	1	1	0	1	1	0	0
Aerosol β and γ	mBq/kWh	2	1	2	1	1	-50.0	0
Aerosol α	µBq/kWh	2	1	2	0	0	-100	0
Strontium 89 and 90	µBq/kWh	15	10	7	5	4	-73.3	-20.0

Specific emissions into the atmosphere

In electricity generation, specific emissions into the atmosphere express the amounts of the typical and significant substances emitted into the atmosphere (SO_2, NO_X, particulates and CO_2) per kWh net of electricity generation or per kWh net of electricity and heat generation (in the case of CHP).

These emissions include:

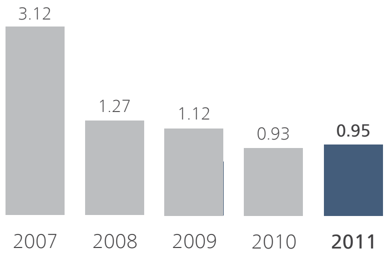
1. **specific emissions from simple thermal generation:** emissions of SO_2, NO_X, particulates and CO_2 into the atmosphere per kWh net of electricity generated in thermal plants;
2. **specific emissions from thermal CHP generation:** emissions of SO_2, NO_X, particulates and CO_2 into the atmosphere per kWh net of electricity and heat generated in thermal CHP plants;
3. **specific emissions from simple and thermal CHP generation vs. total electricity and heat generation:** emissions of SO_2, NO_X, particulates and CO_2 into the atmosphere per kWh net of electricity and heat generated with all the technologies available within the Group (nuclear, thermal and renewable).

The trend of the first two indicators reflects: i) for SO_2, NO_X and particulates, the cumulated effect of the fuel mix, of the efficiency of thermal power plants and of direct prevention and abatement measures; and ii) for CO_2, the cumulated effect of the fuel mix, of the efficiency of thermal power plants and of the marginal contribution of the desulfurization process.

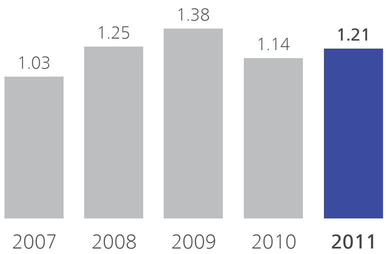
The third indicator expresses the emission efficiency per unit of electricity generated by all of Enel's power plants, considering not only the cumulated effect of the fuel mix and of the efficiency of the overall generating mix, but also the contribution of sources which do not emit atmospheric pollutants. This indicator thus describes the overall effectiveness of environmental policies aimed at reducing polluting emissions, both through investments in thermal generation and deployment of renewables. In 2011, total specific emissions of SO_2 and particulates in simple and thermal CHP generation diminished, whereas those of NO_X increased, owing above all to malfunctions of some burners in Slovak and Argentinian power plants. In the next few years, all pollutants are expected to progressively decline, thanks to a number of measures concerning the overall generating mix and, in particular, to the progressive modernization of the Russian plant of Reftinskaya.

Relative SF_6 emissions, which pertain to all electric activities, express the ratio of the yearly emissions of SF_6 to the year-end volume of SF_6 contained in in-service & in-stock equipment, as well as in the bottles used for replenishments. The percentages of SF_6 over the years have small fluctuations, owing above all to the occasional character of replenishments. However, they all lie below the value reported in the literature and suggested by the IPCC Guidelines for national greenhouse gas inventories (1%).

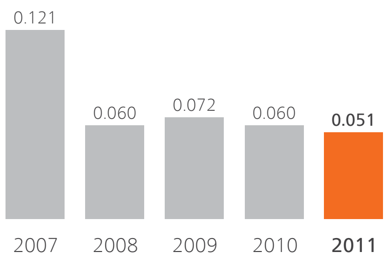
Specific SO_2 emissions from simple thermal generation
(g/kWh thermal net)



Specific NO_X emissions from simple thermal generation
(g/kWh thermal net)



Specific particulate emissions from simple thermal generation
(g/kWh thermal net)



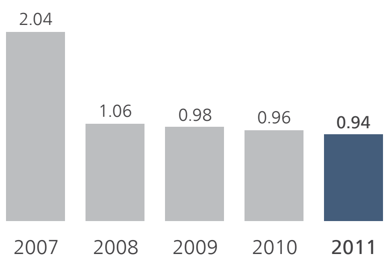
EN20 EN16

Specific emissions from geothermal generation – bearing in mind the considerations made about their origin – are entirely attributed to electricity generation, on the assumption that no steam is lost during drilling and that the fluid used in non-electric applications is liquid (i.e. without gases, except those dissolved in it). These emissions express:

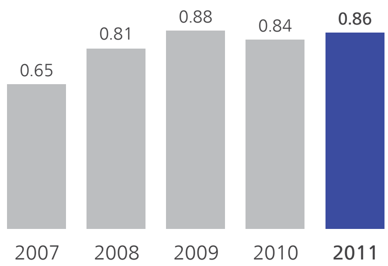
> for H_2S, the cumulated effect of the composition of geothermal steam, of the efficiency of geothermal power plants and of abatement systems; this indicator had a sharp decrease also in 2011;

> for CO_2, the cumulated effect of the composition of geothermal steam and of the efficiency of geothermal power plants.

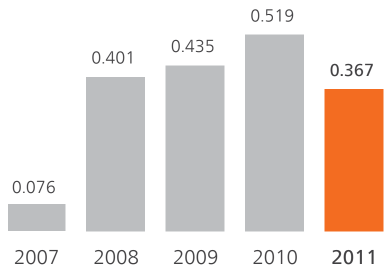
Specific SO_2 emissions from thermal generation (simple and CHP) vs. total electricity and heat generation (g/kWh total net)



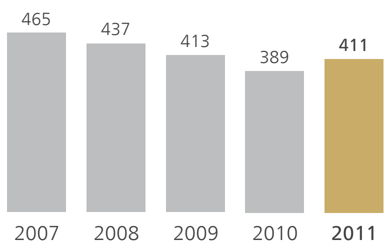
Specific NO_X emissions from thermal generation (simple and CHP) vs. total electricity and heat generation (g/kWh total net)



Specific particulate emissions from thermal generation (simple and CHP) vs. total electricity and heat generation (g/kWh total net)



Specific CO_2 emissions from thermal generation (simple and CHP) vs. total electricity and heat generation (g/kWh total net)



Polluting load of waste waters

Absolute values (1)

			2007	2008	2009	2010	2011
EN21 Conventional polluting load in waste waters discharged by installations							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	22,260	7,245	66,132	85,846	10,046
	in some plants with an overall capacity of	MW	31,643	24,492	27,936	26,765	26,482
	thermal generation (CHP)	kg	0	89,549	53,085	42,430	46,111
	in some plants with an overall capacity of	MW	0	8,183	6,979	6,979	5,135
	nuclear generation	kg	111	49.7	70.3	104	15.2
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	nuclear generation (CHP)	kg	169	168	158	366	257
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total electricity generation	kg	22,540	97,012	119,444	128,746	56,430
	Fuel storage & handling	kg	12.0	12.2	7.70	4.00	22.3
	Total	**kg**	**22,552**	**97,025**	**119,452**	**128,750**	**56,452**
Total nitrogen (expressed as N)	thermal generation	kg	146,778	110,133	286,230	337,125	67,282
	in some plants with an overall capacity of	MW	30,804	27,114	29,549	27,716	26,136
	thermal generation (CHP)	kg	0	0	0	0	34.1
	in some plants with an overall capacity of	MW	0	0	0	0	2,277
	nuclear generation	kg	2,213	7,407	17,612	5,888	10,664
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	nuclear generation (CHP)	kg	86,596	40,295	34,566	32,130	33,275
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total electricity generation	kg	235,587	157,835	338,409	375,143	111,255
	Fuel storage & handling	kg	47.3	16.9	12.6	45.0	57.5
	Total	**kg**	**235,634**	**157,852**	**338,421**	**375,188**	**111,312**
Total phosphorus (expressed as P)	thermal generation	kg	18,234	8,873	16,625	23,217	12,110
	in some plants with an overall capacity of	MW	29,220	24,246	23,372	24,233	26,041
	thermal generation (CHP)	kg	0	0	0	0	75
	in some plants with an overall capacity of	MW	0	0	0	0	21.4
	nuclear generation	kg	76.6	99.4	118	1,189	1,152
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	nuclear generation (CHP)	kg	2,387	2,319	2,213	2,491	2,721
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total electricity generation	kg	20,698	11,292	18,956	26,897	16,059
	Fuel storage & handling	kg	6.15	1.83	1.85	3.00	23.0
	Total	**kg**	**20,704**	**11,294**	**18,958**	**26,900**	**16,082**

(1) The variability of the data in the five-year period is due to the change in the number of plants (defined in the table by the overall capacity in MW) on which the analysis has been made.

			2007	2008	2009	2010	2011
COD	thermal generation	kg	359,746	289,006	335,660	347,461	240,730
	in some plants with an overall capacity of	MW	23,174	27,957	26,655	28,898	25,720
	thermal generation (CHP)	kg	229,453	131,714	72,306	79,815	94,625
	in some plants with an overall capacity of	MW	1,275	1,275	1,255	1,275	1,234
	nuclear generation	kg	1,734	2,064	2,714	24,125	29,400
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	nuclear generation (CHP)	kg	117,003	105,591	111,648	140,870	134,170
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total electricity generation	kg	707,936	528,375	522,329	592,271	498,925
	Fuel storage & handling	kg	325	38.5	397	375	7,691
	Total	**kg**	**708,260**	**528,413**	**522,726**	**592,646**	**506,616**
BOD	thermal generation	kg	82,978	69,734	75,016	118,955	810,493
	in some plants with an overall capacity of	MW	15,995	18,224	22,528	21,177	19,858
	thermal generation (CHP)	kg	33,463	18,167	14,208	15,874	16,724
	in some plants with an overall capacity of	MW	1,275	1,275	3,508	1,275	3,511
	nuclear generation	kg	297	1,376	1,792	4,623	7,986
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	nuclear generation (CHP)	kg	15,290	15,497	17,605	16,021	21,474
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total electricity generation	kg	132,028	104,775	108,621	155,473	856,677
	Fuel storage & handling	kg	345	12.2	167	119	2,581
	Total	**kg**	**132,372**	**104,787**	**108,787**	**155,592**	**859,258**
EN21 **Radionuclides in waste waters discharged by plants**							
Tritium	nuclear generation	GBq	9,028	58,777	57,746	71,013	78,993
	nuclear generation (CHP)	GBq	12,970	12,444	21,621	19,359	20,960
	Total	**GBq**	**21,998**	**71,221**	**79,367**	**90,372**	**99,953**
Corrosion and fission products	nuclear generation	GBq	3.08	12.8	21.7	9.82	19.0
	nuclear generation (CHP)	GBq	0.029	0.034	0.032	0.035	0.038
	Total	**GBq**	**3.11**	**12.9**	**21.8**	**9.85**	**19.1**

EN21 Waste waters

Waste waters include residual waters for industrial uses and meteoric waters collected from the outdoor areas of thermal and nuclear power plants, when they are susceptible to oil contamination. They are treated on a regular basis and always if they are to be returned to surface water bodies. After treatment, waste waters are in part used inside power plants – thereby contributing to coverage of water requirements for industrial uses – and in part released into surface water bodies. The volumes of waste waters are estimated by referring to the potential capability and utilization of water treatment systems, as well as to the modes of operation of the industrial installation to which these systems belong. As is obvious, waste waters reflect the trend of water requirements for industrial uses, with a few deviations due, above all, to the variability of precipitation.

EN21 Polluting load of waste waters

Waste waters carry substances which alter the physico-chemical characteristics of the receiving water bodies, thus causing a potentially negative impact on ecosystems and affecting subsequent water uses (e.g. drinking, farming and recreation).
In the case of Enel, the extent of the problem is much smaller than in other industries, such as the chemical one. Nevertheless, the applicable legislation specifies strict limits for concentration of pollutants, with which Enel complies by using treatment systems. Waste waters are distinguished on the basis of their characteristics (acidic/alkaline, oily, ammonia-containing, coming from desulfurizer drains, meteoric, gray water) and separately treated. After treatment, some of their parameters (e.g. conductivity, pH, turbidity, dissolved oxygen and oil content) are continuously monitored. This activity ensures compliance with legislative limits, as treatment is repeated until compliance is reached.
Also the waste waters that are reused inside power plants (contributing to coverage of water requirements for industrial uses) usually need prior treatment to conform to the applicable legislation.
The use of environmental management systems (certified or to be certified) makes it possible to record the mass emissions of typical and quantitatively significant pollutants (metals and compounds, nitrogen and compounds, phosphorus and compounds), as well as COD (Chemical Oxygen Demand) and BOD (Biochemical Oxygen Demand) in the waste waters released by almost all installations (except for some small thermal power plants).
These data are obtained by multiplying the measured concentrations by the volumes of the released waste waters. The variability of the data of the five-year series is due to the change in the number of plants (defined in the table by the overall capacity in MW) on which the analysis has been made.

EN21 Radionuclides in waste waters (nuclear generation)

The most common sources of radionuclide-containing waste waters are laundries, decontamination areas and leakage from primary loop components. Before being discharged, waste waters are analyzed to determine their level of radioactivity. Their discharge is allowed only if their radionuclide concentrations (corrosion & fission products and tritium) do not exceed the limits mandated by the applicable legislation or specified in the authorizations for releases into water bodies.
The following radioactive isotopes are monitored:
> corrosion, activation and fission products: the same radionuclides as those measured in aerosols (alpha, beta and gamma emitters);
> tritium.

In this Report, the activity of the radionuclides contained in the discharged waste waters (obtained by multiplying their measured concentrations by the volumes of the discharged waste waters) is expressed in billions of Becquerel (GBq).

Key Performance Indicators (KPIs)

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)	mg/kWh thermal net							
Metals and compounds (expressed as metal equivalents)		na	na	na	1.67	0.194	0	-88.4
Total nitrogen (expressed as N)		na	na	na	6.63	1.41	0	-78.7
Total phosphorus (expressed as P)		na	na	na	0.520	0.233	0	-55.2
COD		na	na	na	6.21	5.33	0	-14.2
BOD		na	na	na	3	23.9	0	697
Net specific conventional polluting load of waste waters discharged by plants (thermal generation - CHP)	mg/kWh							
Metals and compounds (expressed as metal equivalents)		na	na	na	0.985	1.40	0	42.1
Total nitrogen (expressed as N)		na	na	na	0	0.004	0	0
Total phosphorus (expressed as P)		na	na	na	0	0.360	0	0
COD		na	na	na	27.3	35.2	0	28.9
BOD		na	na	na	5.44	1.40	0	-74.3
EN21 **Net specific conventional polluting load of waste waters discharged by plants (nuclear generation)**	mg/kWh							
Metals and compounds (expressed as metal equivalents)		0.027	0.003	0.003	0.004	0.001	-96.3	-75.0
Total nitrogen (expressed as N)		0.536	0.423	0.778	0.213	0.424	-20.9	99.1
Total phosphorus (expressed as P)		0.019	0.006	0.005	0.043	0.046	142	7.00
COD		0.420	0.118	0.120	0.873	1.17	179	34.0
BOD		0.072	0.079	0.079	0.167	0.317	340	89.8
EN21 **Net specific conventional polluting load of waste waters discharged by plants (nuclear generation - CHP)**	mg/kWh							
Metals and compounds (expressed as metal equivalents)		0.014	0.013	0.012	0.026	0.017	21.4	-34.6
Total nitrogen (expressed as N)		7.26	3.17	2.53	2.26	2.23	-69.3	-1.30
Total phosphorus (expressed as P)		0.200	0.182	0.162	0.175	0.182	-9.00	4.00
COD		9.81	8.30	8.16	9.90	8.97	-8.60	-9.40
BOD		1.28	1.22	1.29	1.13	1.44	12.5	27.4
EN21 **Net specific polluting load of radionuclides in waste waters**								
Nuclear generation (tritium)	kBq/kWh	2.19	3.36	2.55	2.57	3.14	43.4	22.2
Nuclear generation (CHP) (tritium)	kBq/kWh	1.09	0.978	1.58	1.36	1.40	28.4	2.90

EN21 Specific polluting load of waste waters

This item expresses the amount (per kWh net of thermal generation, simple or CHP) of the typical and significant polluting substances and of the parameter values of the waste waters from thermal and nuclear power plants which are returned to water bodies.

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

Waste

Absolute values

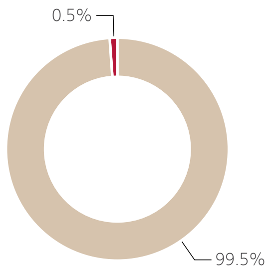
			2007	2008	2009	2010	2011
EN22 Non-hazardous special waste							
Coal bottom ash	fossil-fired thermal generation (simple and CHP)						
production		t	492,101	696,718	680,732	640,309	678,165
delivery to recovery operators		t	91,603	86,622	111,219	106,876	286,778
Coal flyash	fossil-fired thermal generation (simple and CHP)						
production		t	3,733,578	6,771,554	7,838,149	8,435,452	8,301,381
delivery to recovery operators		t	2,347,218	2,697,738	2,259,685	1,814,307	2,226,832
Oil bottom ash	fossil-fired thermal generation (simple and CHP)						
production		t	24.4	0	63.0	1.84	0
delivery to recovery operators		t	0	0	0	1.84	0
Other non-hazardous ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	3,511	6,352	6,310
delivery to recovery operators		t	0	0	0	0	6,310
Gypsum from desulfurization	fossil-fired thermal generation (simple and CHP)						
production		t	860,546	1,782,515	1,698,998	1,563,570	1,978,796
delivery to recovery operators		t	286,811	320,523	328,029	577,405	533,579
Other							
production	electricity generation & geothermal drilling	t	704,373	730,791	812,714	565,440	352,988
	electricity distribution	t	43,384	129,505	208,474	193,385	259,602
	various activities	t	278	1,397	7,091	3,038	1,233
	Total	**t**	**748,035**	**861,692**	**1,028,280**	**761,862**	**613,822**
delivery to recovery operators	electricity generation & geothermal drilling	t	114,314	102,061	85,743	111,333	82,453
	electricity distribution	t	32,477	32,945	42,687	46,975	133,851
	various activities	t	273	1,336	3,019	2,669	1,115
	Total	**t**	**147,064**	**136,342**	**131,450**	**160,977**	**217,418**

			2007	2008	2009	2010	2011
Total							
production	electricity generation & geothermal drilling	t	5,790,622	9,981,578	11,034,167	11,211,124	11,317,640
	electricity distribution	t	43,384	129,505	208,474	193,385	259,602
	various activities	t	278	1,397	7,091	3,038	1,233
	Total	t	5,834,284	10,112,479	11,249,733	11,407,546	11,578,474
delivery to recovery operators	electricity generation & geothermal drilling	t	2,839,945	3,206,945	2,784,676	2,609,923	3,135,951
	electricity distribution	t	32,477	32,945	42,687	46,975	133,851
	various activities	t	273	1,336	3,019	2,669	1,115
	Total	t	2,872,695	3,241,226	2,830,382	2,659,567	3,270,917
EN22 **Hazardous special waste**							
Oil flyash	fossil-fired thermal generation (simple and CHP)						
production		t	1,914	1,403	1,122	1,352	1,395
delivery to recovery operators		t	118	0	753	909	1,080
Other ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	8.17	8.90	31.0
delivery to recovery operators		t	0	0	0.190	8.60	0
Other							
production	electricity generation & geothermal drilling	t	25,769	23,402	48,248	49,060	36,260
	electricity distribution	t	24,606	39,959	20,488	22,727	22,414
	various activities	t	756	1,034	1,481	176	638
	Total	t	51,130	64,394	70,217	71,963	59,312
of which with PCBs	*electricity generation & geothermal drilling*	*t*	*3,161*	*2,966*	*4,135*	*4,634*	*4,357*
	electricity distribution	*t*	*1,479*	*2,025*	*1,428*	*1,306*	*1,906*
	various activities	*t*	*0*	*0.640*	*403*	*1.07*	*3.97*
	Total	*t*	*4,640*	*4,991*	*5,966*	*5,941*	*6,267*
delivery to recovery operators	electricity generation & geothermal drilling	t	3,731	4,416	6,075	8,959	21,418
	electricity distribution	t	12,800	18,496	15,837	17,586	15,624
	various activities	t	2.35	102	312	16.0	130
	Total	t	16,533	23,014	22,225	26,561	37,171
of which with PCBs	*electricity generation & geothermal drilling*	*t*	*1,177*	*2,512*	*3,893*	*4,408*	*4,058*
	electricity distribution	*t*	*1,200*	*1,723*	*1,069*	*1,262*	*1,865*
	various activities	*t*	*0*	*0*	*0*	*0.574*	*2.74*
	Total	*t*	*2,377*	*4,236*	*4,962*	*5,671*	*5,925*

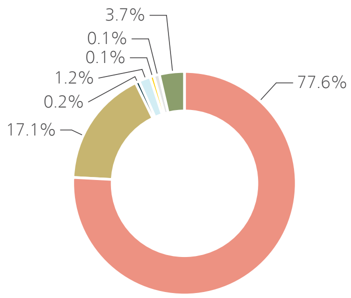
			2007	2008	2009	2010	2011
Total							
production	electricity generation & geothermal drilling	t	27,683	24,805	49,378	50,421	37,686
	electricity distribution	t	24,606	39,959	20,488	22,727	22,414
	various activities	t	756	1,034	1,481	176	638
	Total	**t**	**53,044**	**65,797**	**71,347**	**73,324**	**60,738**
delivery to recovery operators	electricity generation & geothermal drilling	t	3,849	4,416	6,829	9,876	22,498
	electricity distribution	t	12,800	18,496	15,837	17,586	15,624
	various activities	t	2.35	102	312	16.0	130
	Total	**t**	**16,652**	**23,014**	**22,978**	**27,478**	**38,251**
EN22 **Total special waste**							
production	electricity generation & geothermal drilling	t	5,818,305	10,006,383	11,083,546	11,261,546	11,355,326
	electricity distribution	t	67,989	169,463	228,963	216,111	282,016
	various activities	t	1,034	2,430	8,572	3,214	1,870
	Total	**t**	**5,887,328**	**10,178,276**	**11,321,080**	**11,480,871**	**11,639,212**
delivery to recovery operators	electricity generation & geothermal drilling	t	2,843,795	3,211,360	2,791,504	2,619,799	3,158,449
	electricity distribution	t	45,277	51,441	58,524	64,561	149,475
	various activities	t	275	1,439	3,332	2,685	1,244
	Total	**t**	**2,889,347**	**3,264,240**	**2,853,360**	**2,687,045**	**3,309,168**
EN22 **Radioactive waste**							
Low- and intermediate-level: production	nuclear generation (simple and CHP)						
liquid		m^3	125	119	93.6	80.2	56.6
solid		m^3	39.3	127	218	241	300
of which fraction not storable in off-site surface or subsurface sites		*m^3*	*0*	*72.5*	*0*	*33.4*	*32.3*
solid		t	81.2	39.4	31.7	29.3	31.0
of which fraction not storable in off-site surface or subsurface sites		*t*	*12.8*	*0*	*0*	*0*	*0*

EN22 Special waste

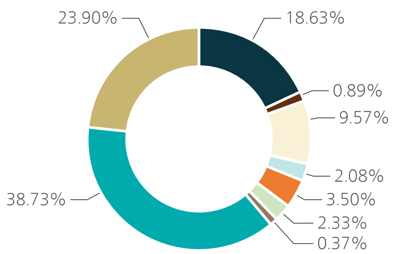
Special waste in 2011
Total production: 11.64 million t



Non-hazardous special waste in 2011
Total production: 11.58 million t



Hazardous special waste in 2011
Total production: 60.7 thousand t



Special waste represents part of the waste produced by Enel's activities, as specified in the national legislation applicable in the countries where the Group operates.

For the classification of waste into non-hazardous and hazardous, Enel refers to EU legislation.

> In the pie chart, the non-hazardous special waste includes: i) the most representative items (specified in the "Waste" table: coal ash – flyash and bottom ash – and gypsum from desulfurization; ii) "other" waste – also globally shown in the tables –, i.e. typical items which are individually inventoried or grouped as "not included in the previous categories". The typical items that are individually inventoried are: machinery & equipment and their parts; sludges from water treatment (waste waters and waters from dredging or septic tanks); materials removed by Enel from the trashracks of hydro power plant intake structures; the portion of alluvial sediments – mechanically removed from hydro basins upon emptying – which is not reused locally, because it is not classified as inert or classified as inert without a specified use; drill cuttings from geothermal activities; and packaging materials (paper and cardboard, wood, glass, plastics and metal). The waste "not included in the previous categories" consists of items of a general or exceptional nature, both liquid (e.g. aqueous waste from groundwater remediation) and solid (e.g. waste from fuel storage and preparation in coal-fired thermal power plants, absorbents, filtering materials, rags and protective clothing, batteries and accumulators, paper and cardboard, cables, miscellaneous components, iron and steel, wood, insulating materials, bituminous mixes, plastics, copper, bronze, brass, saturated or exhausted ion-exchange resins, waste equivalent to non-separately collected municipal waste, inorganic waste, mixed waste from building and demolition activities, waste from primary filtering and screening processes, waste from cooling water treatment, salts and their solutions, soil and rocks, exhausted toner cartridges, glass), as well as other items produced in low amounts but also individually inventoried, such as fuel oil bottom ash and other ash.

> Hazardous special waste comprises: i) fuel oil flyash (specified in the "Waste" table as the most representative item); ii) "other" waste (only specified in the pie chart), including: typical items which are individually inventoried (PCB-contaminated equipment, e.g. transformers, capacitors and their parts; used oils; used batteries; asbestos-containing materials; sludges from condensation of geothermal steam; waste from material contaminated by geothermal fluids); or items of a general or exceptional nature (oil-stained clothing, dirt and deposits, soil from remediation works, oil-in-water emulsions, etc.), which are grouped under the "remaining solid" and "remaining liquid" waste categories. "Delivery to recovery operators" means the waste which is transferred to operators authorized to recover waste. The waste data are those yearly reported to the waste inventory (for activities carried out within the European Union) or obtained from the qualitative and quantitative characteristics of the waste indicated in the relevant records.

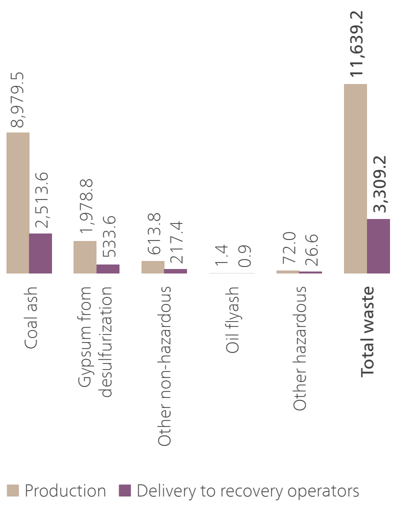
The results show that:

> the production of ash is obviously correlated with fuel consumption and characteristics, as well as with the presence of more or less effective treatment systems (bag filters or electrostatic precipitators); however, the amount of ash depends on various factors, such as: frequency of ash removal from flue-gas ducts and from the hoppers of boilers and of particulate collectors; possible "watering" of the ash to prevent the formation of dust during its temporary storage in the plant site; combustion of flyash in the upper part of boiler furnaces in the case of dual oil-gas firing; the production of gypsum naturally reflects limestone consumption in the flue-gas desulfurization process;

> the "remaining solid" waste includes the following main items: in the case of electricity generation, packaging materials containing residues of or contaminated by hazardous substances, absorbents, filtering materials, rags and protective clothing contaminated by hazardous substances, fluorescent tubes and other mercury-containing waste; in the case of distribution, soil from clean-up of accidental oil spills;

> the "remaining liquid" waste mostly derives from meteoric waters potentially contaminated by oils and collected in the vats underlying the transformers of high-voltage/medium-voltage substations in the electricity distribution grid.

Main categories of special waste in 2011 (thousand t)



Radioactive waste (nuclear generation)

The radioactive waste produced in Slovakia is treated in State-owned facilities. Both liquid and solid radioactive waste items are classified into the following categories:

> low-level (e.g. clothing, paper towels, laboratory equipment used in areas where radioactive material is handled) and intermediate-level (e.g. contaminated equipment, sludges and resins from various treatments); this waste produces less than 2 kW/m^3 of residual heat and may be further distinguished into:
  - "short-lived", the waste that, after conditioning, qualifies under the requirements for off-site surface or subsurface storage (specified average concentration of alpha-emitting nuclides: below 400 Bq/g);
  - "long-lived": the waste that, after conditioning, does not qualify under the requirements for off-site surface or subsurface storage (specified average concentration of alpha-emitting nuclides: equal to or greater than 400 Bq/g);

> high-level: waste releasing more than 2 kW/m^3 of residual heat; it does not qualify under the requirements for off-site surface or subsurface storage; production of this waste is very small under the normal operating conditions of a nuclear power plant (e.g. metal waste and corrosion products removed during clean-up of the reactor core). Solid waste is sorted on the basis of its activity and classified as follows:
  - burnable technological waste;
  - compactable technological waste;
  - suitable for other treatment, such as fragmentation and cementing.

The waste is characterized and, depending on its type, it may be decontaminated, dried, cut, low-pressure compacted and finally packaged in drums or plastic bags. These drums or bags are temporarily segregated in shielded enclosures and then fed to treatment systems. The waste that cannot be stored in off-site surface or subsurface sites and remains in the plant site is placed into stainless steel containers.
Another category of solid waste, whose activity decreases rapidly (e.g. filters of the reactor ventilation system), may be disposed of as special waste (normal industrial waste) immediately or after an adequate period of decay within the plant.
Liquid waste mostly consists of concentrated solutions resulting from the treatment of waste waters via vaporization (see "Radionuclides in waste waters" in the "Liquid releases" chapter) and of drainage from systems, pipings and floors of the reactor building. Other contaminated liquid waste includes used oils, oils separated from waters, solvents, etc.

In Spain, radioactive waste management is defined in the General Radioactive Waste Plan prepared by Enresa (Empresa Nacional de Residuos Radiactivos) and approved by the Ministry of Industry. The current plan was approved in July 2006.

Two categories of radioactive waste are considered:

> low- and intermediate-level waste with "short-lived" beta-gamma radiation and limited content of "long-lived" alpha emitters; this waste is treated, solidified (if liquid) and conditioned in 220-liter drums in the nuclear power plants (resins, concentrates, sludges, dried sludges and filters are cementified, while compactable waste is supercompacted); once the waste has been accepted by Enresa, it is delivered to the El Cabril facility for final storage;

> high-level waste with higher concentration of "long-lived" emitters and creation of considerable amounts of residual heat; the basic strategy (applying also to some intermediate-level waste which is not suitable for being finally stored in the El Cabril facility) is to deliver this waste to a dry, centralized, temporary storage facility operated by Enresa.

The tables display the most significant absolute data on radioactive waste: share of waste produced since the beginning of operation of the power plants and stored inside the same plants, as well as production of low/intermediate- and high-level waste in the year, distinguishing in both cases between liquid and solid waste.
The production of intermediate- and low-level radioactive waste had a declining trend, in line with the program of reduction which was introduced after retrofitting the sewage and drainage system of the Slovak plants. These retrofits permit to recirculate liquid radioactive waste (containing boric acid) inside the plants and thus to avoid its discharge.

Key Performance Indicators (KPIs)

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 Specific waste production								
Coal and brown-coal ash (thermal generation)	g/kWh net from coal and brown coal	89.9	79.1	70.0	69.3	59.0	-34.4	-14.9
Oil flyash (thermal generation)	g/kWh net from fuel oil & gas oil	0.176	0.075	0.054	0.075	0.082	-53.4	9.30
Oil bottom ash (thermal generation)	g/kWh net from fuel oil & gas oil	0.179	0.075	0.058	0.075	0.082	-54.2	9.30
Coal and brown-coal ash (thermal generation - CHP)	g/kWh net from coal and brown coal	133	219	204	231	234	75.9	1.30
EN22 Specific production of radioactive waste								
low- and intermediate-level (nuclear generation)								
liquid	mm^3/kWh net	0.847	0.072	0.146	0.144	0.069	-91.9	-52.1
solid	mg/kWh net	10.5	0	0	0	0	-100	0
	mm^3/kWh net	9.51	7.24	9.65	8.74	11.9	25.1	36.2
low- and intermediate-level (nuclear generation - CHP)								
liquid	mm^3/kWh net	10.2	9.24	6.59	5.36	3.78	-62.9	-29.5
solid	mg/kWh net	3.18	3.10	2.32	2.06	2.07	-34.9	0.500
EN22 Low-, intermediate- and high-level radioactive waste stored inside plants								
liquid	% in volume of production since the start of operation	92.0	64.3	58.2	53.6	46.7	-49.2	-12.9
solid	% in weight of production since the start of operation	87.9	37.1	32.8	30.8	27.0	-69.3	-12.3
	% in volume of production since the start of operation	0	21.5	69.9	27.1	25.1	0	-7.40

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 Waste recovery								
Coal and brown-coal ash	% production	57.7	37.3	27.8	21.2	28.0	-51.5	32.1
bottom ash	*% production*	*18.6*	*12.4*	*16.3*	*16.7*	*42.3*	*127*	*153*
flyash	*% production*	*62.9*	*39.8*	*28.8*	*21.5*	*26.8*	*-57.4*	*24.7*
Gypsum from desulfurization	% production	33.3	18.0	19.3	36.9	27.0	-18.9	-26.8
Other non-hazardous special waste								
electricity generation & geothermal drilling	% production	16.2	14.0	10.5	19.5	24.7	52.5	26.7
electricity distribution	% production	74.9	25.4	20.5	24.3	51.6	-31.1	112
fuel storage & handling, gas distribution	% production	98.1	93.5	21.4	88.7	100	1.90	12.7
Total	**% production**	**19.7**	**15.8**	**12.5**	**20.7**	**36.0**	**82.7**	**73.9**
Total non-hazardous special waste								
electricity generation & geothermal drilling	% production	49.0	32.1	25.2	23.3	27.7	-43.5	18.9
electricity distribution	% production	74.9	25.4	20.5	24.3	51.6	-31.1	112
fuel storage & handling, gas distribution	% production	98.1	93.5	21.4	88.7	100	1.90	12.7
Total	**% production**	**49.2**	**32.0**	**25.1**	**23.3**	**28.2**	**-42.7**	**21.0**
Oil flyash	% production	6.18	0	67.1	67.2	77.4	1,152	15.2
Other hazardous special waste								
electricity generation & geothermal drilling	% production	14.5	18.9	12.6	18.3	59.0	307	222
electricity distribution	% production	52.0	46.3	77.3	77.4	69.7	34	-9.90
fuel storage & handling, gas distribution	% production	0.311	1.25	0	17.6	49.6	15,849	182
Total	**% production**	**32.3**	**35.7**	**31.9**	**37.0**	**63.1**	**95.4**	**70.5**
Total hazardous special waste								
electricity generation & geothermal drilling	% production	13.9	17.8	13.8	19.6	59.7	330	205
electricity distribution	% production	52.0	46.3	77.3	77.4	69.7	34.0	-9.90
fuel storage & handling, gas distribution	% production	0.311	1.25	0	17.6	49.6	15,849	182
Total	**% production**	**31.4**	**34.9**	**32.4**	**37.5**	**63.4**	**102**	**69.1**
Total special waste								
electricity generation & geothermal drilling	% production	48.9	32.1	25.2	23.3	27.8	-43.1	19.3
electricity distribution	% production	66.6	30.4	25.6	29.9	53.0	-20.4	77.3
fuel storage & handling, gas distribution	% production	26.6	42.3	20.6	80.2	97.5	267	21.6
Total	**% production**	**49.1**	**32.1**	**25.2**	**23.4**	**28.4**	**-42.2**	**21.4**

EN22 Specific production of waste

Ash and gypsum from desulfurization (both from thermal generation, simple and CHP) are the only categories of waste which have a significant correlation with the volume of activities.

The tables show the overall production of coal ash and oil ash per kWh net (thermal generation) or kWh net (CHP) obtained with each of the two fuels.

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

The net specific production of coal and brown-coal ash from thermal generation was down by roughly 15% on 2010 (59 g/kWh in 2011), whereas the one of coal and brown-coal ash from CHP thermal generation grew, owing above all to the higher amount of unburnt carbon particles in the coal used in Russia.

For nuclear generation, the tables show two indicators that are typical of the sector:

> production of radioactive waste (distinguished by activity and state of aggregation) per unit of energy produced in the year;
> ratio of the amount of (liquid and solid) radioactive waste stored in the plant site to the overall amount of the same waste produced since the beginning of operation of the plant.

In the five-year period, the production of liquid and solid, intermediate- and low-level radioactive waste per unit of energy in CHP nuclear plants had a declining trend; this result is to be attributed to retrofits of the sewage and drainage systems of the Slovak plants, permitting to recirculate liquid radioactive waste (containing boric acid) inside the plants and thus to avoid its discharge.

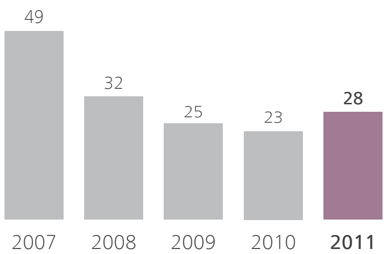
EN22 Special waste recovery

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

Overall special waste recovery is now close to 30%, with an increase with respect to 2010.

The erratic pattern of hazardous and non-hazardous waste production (especially from the technological cycles producing lower amounts thereof) is to be ascribed, above all, to two factors: i) the change of Enel's assets in 2007 and 2008 (Endesa, OGK-5 and Muntenia, sale of gas assets); and ii) the nature of this waste, because it originates from operation and maintenance activities, which generate different types of waste over the years with different opportunities of recovery.

Total waste recovery
(% of waste production)



The following are the methods used for disposing of and recovering the waste produced:

> Methods of disposal
  - specially engineered landfill (e.g. placement into lined, discreet cells which are capped and isolated from one another and the environment) for non-recovered ash and gypsum;
  - incineration on land (for biological waste).

> Methods of recovery
  - used principally as a fuel or other means to generate energy (oil ash, dirty rags and other burnable waste);
  - regeneration/recovery of solvents (waste from chemical laboratories);
  - recycling/reclamation of metals and metal compounds;
  - recycling/reclamation of inorganic materials (recovered ash and gypsum);
  - regeneration (oils and batteries).

EN24 Weight of transported, imported, exported or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III and VIII, and percentage of transported waste shipped internationally

The overall weight of hazardous waste delivered by Enel or on behalf of Enel to recovery or disposal operators coincides with the amounts of the individual types of waste produced during the year, except for the amounts temporarily remaining in authorized deposits, located in the waste production sites. All the amounts of waste are delivered to authorized waste management operators. Enel does not import or export waste.
For details, see indicator EN22.

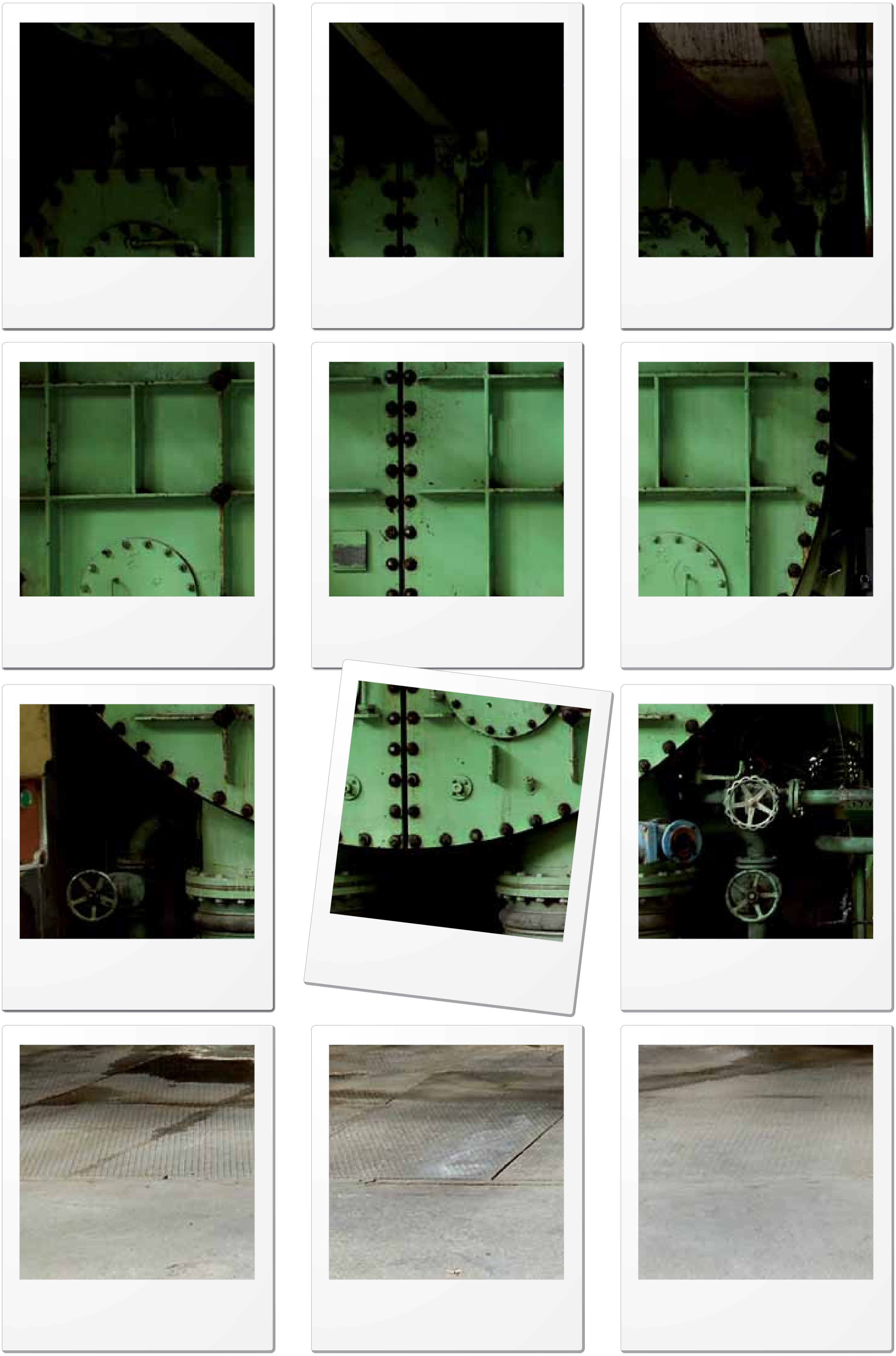
Percentage of products sold and their packaging materials that are reclaimed by category

To carry out its activities, the Enel Group purchases a broad range of products and raw materials in the market. These products and materials are packaged in containers of different shape and materials.

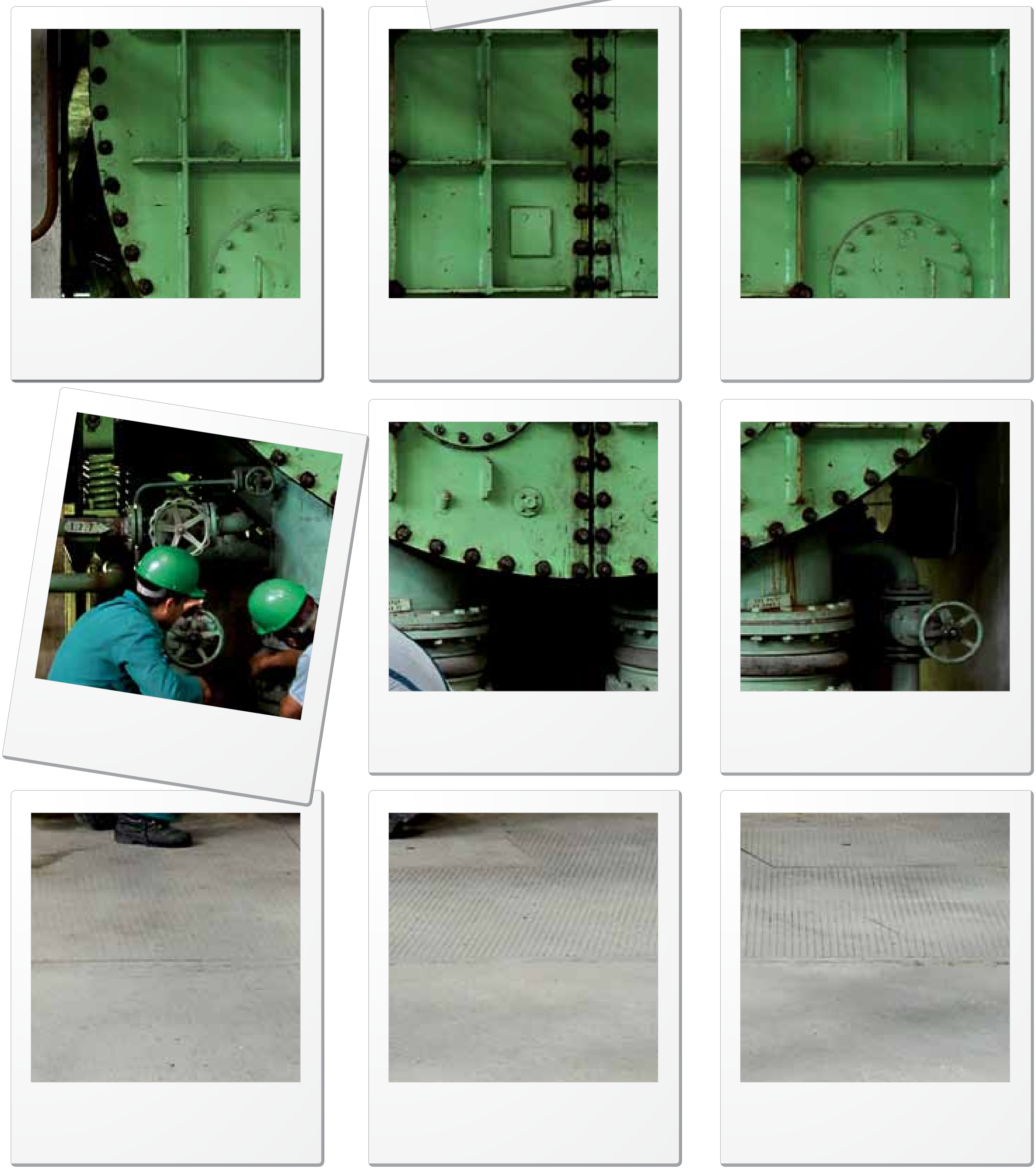
The following are the categories of packaging materials that are produced and recovered.

			2007	2008	2009	2010	2011
Waste packaging (non-hazardous special waste)							
Paper and cardboard packaging (CER 15 01 01)	production	t	0	69.4	326	206	191
	delivery to recovery operators	t	0	63.1	260	184	180
Wooden packaging (CER 15 01 03)	production	t	0	396	461	889	2,944
	delivery to recovery operators	t	0	372	419	909	2,910
Plastic packaging (CER 15 01 02)	production	t	0	18.6	35.6	137	91.8
	delivery to recovery operators	t	0	13.4	18.7	119	82.5
Metallic packaging (CER 15 01 04)	production	t	0	13.0	40.4	19.1	44.3
	delivery to recovery operators	t	0	5.04	5.56	16.1	40.3
Other waste packaging not falling under the previous categories	production	t	2,072	4,793	1,596	1,554	1,761
	delivery to recovery operators	t	1,550	3,750	1,176	1,361	1,542
Paper and cardboard (CER 19 12 01, 20 01 01)	production	t	0	94.3	451	432	425
	delivery to recovery operators	t	0	92.8	356	392	392
Ferrous metal (iron, aluminum and steel) (CER 12 01 01, 12 01 02, 16 01 17, 17 04 05, 19 10 01, 19 10 02)	production	t	0	19,130	33,308	30,376	31,573
	delivery to recovery operators	t	0	12,253	19,060	30,087	32,020
Wood (CER 19 12 07, 17 02 01, 20 01 38)	production	t	0	1,571	1,637	1,915	2,917
	delivery to recovery operators	t	0	1,535	1,454	1,948	2,858
Plastic (CER 07 02 13, 12 01 05, 16 01 19, 17 02 03, 19 12 04, 20 01 39)	production	t	0	272	762	601	417
	delivery to recovery operators	t	0	113	501	484	324
Copper, bronze, brass (CER 17 04 01)	production	t	0	351	960	1,660	1,072
	delivery to recovery operators	t	0	338	615	1,865	1,286
Glass (CER 16 01 20, 17 02 02, 20 01 02)	production	t	0	39.5	426	133	150
	delivery to recovery operators	t	0	28.9	104	96.3	129
Waste packaging (hazardous special waste)							
Packaging containing residues of or contaminated by dangerous substances (CER 15 01 10)	production	t	0	59.8	170	221	191
	delivery to recovery operators	t	0	6.67	18.8	147	107
Metal waste contaminated with dangerous substances (CER 17 04 09, 15 01 11)	production	t	0	44.8	90.6	924	201
	delivery to recovery operators	t	0	2.29	51.4	857	119
Glass, plastic and wood containing or contaminated with dangerous substances (CER 17 02 04)	production	t	0	480	246	78.9	348
	delivery to recovery operators	t	0	374	41.8	9.37	120

The pursuit of environmental management policies throughout the Group and the dissemination of ISO 14001-certified or EMAS-registered environmental management systems (with emphasis on performance) improve the sorting of waste and, consequently, the recovery of packaging materials.
Packaging materials are separately collected (paper and cardboard, wood, plastics, metals and glass). Metal waste is sold, whereas the other separately-collected items of waste are disposed of at zero or extremely low costs.



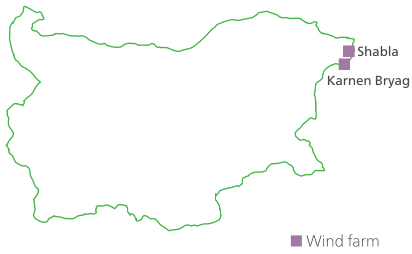
Europe



Bulgaria

Wind power generation

Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
2	42	67

Power installations

Power plants no.	Net maximum electrical capacity MW
2	**42**

Wind power generation
Total: 42 MW

Equivalent yearly hours of utilization*

Wind: **1,586 hours**

* Yearly generation/capacity ratio.

Net electricity generation
Total: 67 million kWh

Avoided CO_2 emissions

Due to wind generation: **85,675 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	1	1	3	3	2
thermal	no.	1	1	1	1	0
wind	no.	-	-	2	2	2
Net maximum electrical capacity	MW	778	602	796	850	42.0
thermal	MW	778	602	775	808	0
wind	MW	0	0	21.0	42.0	42.0
EN29 **Real-estate & service management** (1)						
Vehicle fleet						
service vehicles	no.	-	-	-	9	0
Gross real-estate surface area	thousand m^2	-	-	-	0.955	0

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
fuel oil (HS)	thousand t	7.11	6.18	6.92	4.36	0
	thousand toe	6.75	5.87	6.57	4.14	0
brown coal	thousand t	6,614	6,969	6,702	8,268	0
	thousand toe	1,051	1,114	1,071	1,309	0
Total	thousand toe	1,058	1,120	1,077	1,313	0
	TJ	44,306	46,897	45,102	54,964	0
Grand total	thousand toe	1,058	1,120	1,077	1,313	0
	TJ	44,306	46,897	45,102	54,964	0
EN4 **Primary electricity**						
Various activities	million kWh	0	0	0	0.072	0
EN8 **Water for industrial uses**						
From rivers (including meteoric waters from secondary rainfall)	million m^3	25.7	23.5	20.3	20.1	0
From wells	million m^3	0.091	0.036	0.113	0	0
Total abstraction from inland waters	million m^3	25.8	23.6	20.4	20.1	0
EN10 From waste waters (used inside plants)	million m^3	4.39	4.15	3.18	9.83	0
Total requirements	million m^3	30.2	27.7	23.6	30.0	0
for thermal generation	million m^3	30.2	27.7	23.6	30.0	0
EN1 **Expendables**						
Resins	t	50.0	38.4	92.8	2.40	0
Hydrazine	t	3.70	2.10	1.60	1.70	0
Ammonia	t	8.10	7.90	2.60	5.70	0
Limestone for flue-gas desulfurization	t	244,090	400,081	387,675	466,716	0
Sodium hypochlorite	t	0	0	10.2	32.4	0
Trisodium phosphate	t	2.10	1.85	2.78	3.15	0
Lime	t	164	331	762	886	0
Ferric chloride	t	35.7	127	119	73.2	0
Polyelectrolyte	t	0.500	1.37	1.81	1.75	0
Sulfuric & hydrochloric acids	t	938	738	611	1,143	0
Caustic soda	t	867	669	248	244	0
Lubricating oil	t	74.1	194	142	98.7	0.290
Dielectric oil	t	10.4	0	0	0.550	0
Printing paper	t	0	0	0	0.165	0
Other	t	45.6	59.0	73.7	82.7	0
Total	t	246,288	402,251	389,743	469,292	0.290
for thermal generation	t	246,288	402,251	389,743	469,292	0
for wind generation	t	0	0	0	0	0.290

(1) These activities have been surveyed since 2010.
-: no data due to absence of activities in the year.

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**3,467**	**3,720**	**3,731**	**4,673**	**0**
fuel oil & gas oil	million kWh	22.0	19.5	22.8	14.7	0
brown coal	million kWh	3,445	3,700	3,709	4,658	0
From renewables (wind)	**million kWh**	**0**	**0**	**11.1**	**59.8**	**66.6**
Total	**million kWh**	**3,467**	**3,720**	**3,743**	**4,733**	**66.6**

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	99.7	28.5	14.9	15.5	0
EN20 NO_X	thermal generation	thousand t	5.44	4.78	3.87	3.86	0
EN20 Particulates	thermal generation	thousand t	1.55	0.816	0.837	0.130	0
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	4,697	4,996	5,004	5,892	0
	fossil-fired thermal generation (from desulfurization)	thousand t	107	171	162	195	0
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**4,804**	**5,167**	**5,166**	**6,086**	**0**
EN18 Avoided CO_2 emissions							
Due to wind power generation		thousand t	-	-	15.4	77.9	85.7
EN21 Waste waters (discharged quantity)	thermal generation	million m^3	6.28	7.63	4.64	4.36	0
EN21 Conventional polluting load in waste waters discharged by installations							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	6,453	4,912	939	773	0
	in some plants with an overall capacity of	MW	778	602	775	808	0
Total nitrogen (expressed as N)	thermal generation	kg	-	33,111	23,417	18,652	0
	in some plants with an overall capacity of	MW	-	602	775	808	0
Total phosphorus (expressed as P)	thermal generation	kg	-	1,487	783	413	0
	in some plants with an overall capacity of	MW	778	602	775	808	0
COD	thermal generation	kg	1,891	2,981	1,504	1,854	0
	in some plants with an overall capacity of	MW	778	602	775	808	0
BOD	thermal generation	kg	664	876	404	583	0
	in some plants with an overall capacity of	MW	778	602	775	808	0

	Source		2007	2008	2009	2010	2011
EN22 Non-hazardous special waste							
Coal bottom ash	thermal generation						
production		t	107,008	111,780	106,808	120,792	0
delivery to recovery operators		t	0	0	500	0	0
Coal flyash	thermal generation						
production		t	963,072	1,006,024	961,275	1,087,130	0
delivery to recovery operators		t	0	0	4,500	0	0
Gypsum from desulfurization	thermal generation						
production		t	419,834	682,941	655,280	787,517	0
delivery to recovery operators		t	0	0	1,456	219,692	0
Other	electricity generation						
production		t	24,269	38,863	28,845	27,138	28.6
delivery to recovery operators		t	3,772	5,523	3,542	2,578	0
Total	**electricity generation**						
production		**t**	**1,514,183**	**1,839,608**	**1,752,208**	**2,022,578**	**28.6**
delivery to recovery operators		**t**	**3,772**	**5,523**	**9,998**	**222,270**	**0**
EN22 Hazardous special waste	electricity generation						
production		t	823	1,114	134	266	0.643
of which with PCBs		*t*	*72.3*	*67.9*	*106*	*144*	*0.643*
delivery to recovery operators		t	66.9	76.1	124	140	0
of which with PCBs		*t*	*66.9*	*58.3*	*124*	*139*	*0*
EN22 Total special waste							
production	electricity generation	t	1,515,005	1,840,722	1,752,343	2,022,844	29.3
	various activities	t	0	0	134	0	0
delivery to recovery operators	electricity generation	t	3,839	5,599	10,122	222,410	0

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	3,052	3,011	2,887	2,809	0	-100	-100
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	8.72	7.45	6.32	6.41	0	-100	-100
excluding contribution of as-is sea water	liters/kWh	8.72	7.45	6.32	6.41	0	-100	-100
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	85.2	84.9	86.0	67.2	0	-100	-100
from wells	% of requirements	0.301	0.130	0.479	0	0	-100	0
Total from inland waters	**% of requirements**	**85.5**	**85.0**	**86.5**	**67.2**	**0**	**-100**	**-100**
EN10 from waste waters (used inside plants)	% of requirements	14.5	15.0	13.5	32.8	0	-100	-100
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	0.638	0.524	0.610	0.315	0	-100	-100
brown coal	% of total fuel consumption	99.4	99.5	99.4	99.7	0	-100	-100
HS fuel oil	% of total fuel oil consumption	100	100	100	100	0	-100	-100

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
wind and solar (photovoltaic)	% of total generation	0	0	0.297	1.26	100	0	7,836
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	28.8	7.66	3.99	3.32	0	-100	-100
EN20 NO_X (thermal generation)	g/kWh thermal net	1.57	1.28	1.04	0.827	0	-100	-100
EN20 Particulates (thermal generation)	g/kWh thermal net	0.447	0.219	0.224	0.028	0	-100	-100
EN16 CO_2 (thermal generation)	g/kWh thermal net	1,386	1,389	1,385	1,302	0	-100	-100
EN20 SO_2 (total from thermal generation)	g/kWh total net	28.8	7.66	3.98	3.28	0	-100	-100
EN20 NO_X (total from thermal generation)	g/kWh total net	1.57	1.28	1.03	0.816	0	-100	-100
EN20 Particulates (total from thermal generation)	g/kWh total net	0.447	0.219	0.224	0.027	0	-100	-100
EN16 CO_2 (total from thermal generation)	g/kWh total net	1,386	1,389	1,380	1,286	0	-100	-100
EN22 **Specific waste production**								
Brown-coal ash (thermal generation)	g/kWh net from brown coal	311	302	288	259	0	-100	-100
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	0.165	0	0	-100
Total nitrogen (expressed as N)	mg/kWh thermal net	0	0	0	3.99	0	0	-100
Total phosphorus (expressed as P)	mg/kWh thermal net	0	0	0	0.088	0	0	-100
COD	mg/kWh thermal net	0	0	0	0.397	0	0	-100
BOD	mg/kWh thermal net	0	0	0	0.125	0	0	-100
EN22 **Specific waste production**								
Coal and brown-coal ash (thermal generation)	g/kWh net from coal and brown coal	311	302	288	259	0	-100	-100
EN22 **Waste recovery**								
Brown-coal ash	% production	0	0	0.468	0	0	0	0
bottom ash	*% production*	*0*	*0*	*0.468*	*0*	*0*	*0*	*0*
flyash	*% production*	*0*	*0*	*0.468*	*0*	*0*	*0*	*0*
Gypsum from desulfurization	% production	0	0	0.222	27.9	0	0	-100
Other non-hazardous special waste electricity generation	% production	15.5	14.2	12.3	9.50	0	-100	-100
Total non-hazardous special waste electricity generation	% production	0.249	0.300	0.571	11.0	0	-100	-100
Other hazardous special waste electricity generation	% production	8.13	6.84	92.1	52.6	0	-100	-100
Total special waste electricity generation	% production	0.253	0.304	0.578	11.0	0	-100	-100

Highlights of 2011

Enel operates in Bulgaria through Enel Green Power (wind power generation).

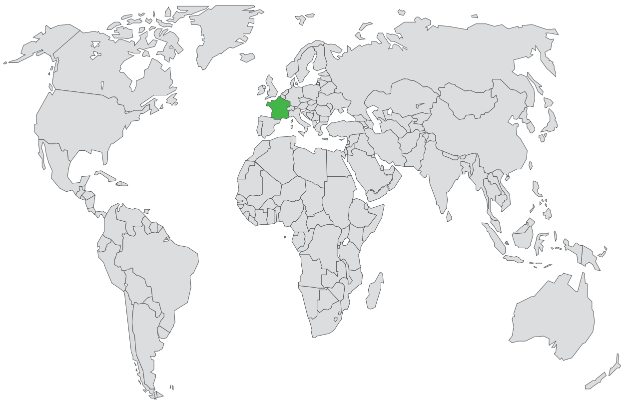
At the end of June 2011, Enel finalized the sale of its brown coal-fired thermal power plant of Maritza, with a net maximum capacity of 808 MW. The Enel Group now operates in Bulgaria through Enel Green Power, whose wind farms have a net maximum capacity of 42 MW.

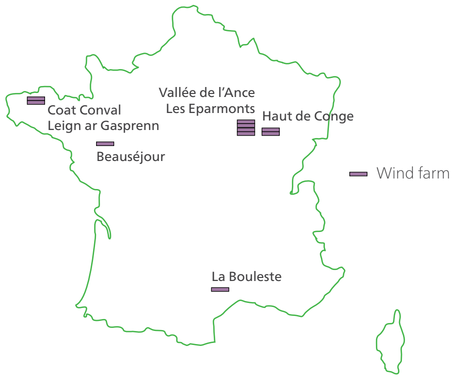
EN18 Wind power generation displaced about 86,000 t of CO_2 emissions into the atmosphere (about 11% more than last year) thanks to an equivalent proportional increase in wind power generation.

France

Wind power generation

Enel Green Power SpA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
16	166	245

Power installations

	Power plants no.	Net maximum electrical capacity MW
	16	**166**

Net electricity generation

Total: 245 million kWh

Equivalent yearly hours of utilization*

Wind: **1,473 hours**

* Yearly generation/capacity ratio.

Avoided CO_2 emissions

Due to wind generation: **159,276 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Environmental Results

Status data

		2008	2009	2010	2011
Power-generating installations					
Power plants (wind)	**no.**	**1**	**7**	**10**	**16**
Net maximum electrical capacity (wind)	**MW**	**11.6**	**68.1**	**102**	**166**
EN29 **Real-estate & service management**					
Vehicle fleet					
service vehicles	no.	-	10	9	11
Gross real-estate surface area	thousand m^2	-	0.700	1.18	1.18

Resources

		2008	2009	2010	2011
EN1 EN3 **Fossil fuels**					
Real-estate management	thousand toe	0	0.013	0.013	0.018
	TJ	0	0.544	0.544	0.754
EN4 **Primary electricity**					
Real-estate management	million kWh	0	0.013	0.028	0.076
Water for non-industrial uses					
Real-estate & service management	million m^3	0	0.001	0.001	0
EN1 **Expendables**					
Lubricating oil	t	0	0	19.2	0.300
Dielectric oil	t	0	0	5.50	0
Printing paper	t	0	0.499	0.798	0.936
Total	**t**	**0**	**0.499**	**25.5**	**1.24**
for wind generation	t	0	0	24.7	0

Processes and products

		2008	2009	2010	2011
Electricity generation (net)					
From renewables (wind)	**million kWh**	**7.00**	**65.9**	**149**	**245**

Emissions

	Source		2008	2009	2010	2011
Emissions into the atmosphere						
EN16 CO_2	real-estate management	thousand t	0	0.039	0.039	0.056
EN18 **Avoided CO_2 emissions**						
Due to wind generation		thousand t	4.56	42.9	97.0	159
EN22 **Hazardous special waste**						
production	electricity generation	t	0	0	0	4.00
	various activities	t	0	0	0.087	0.412
of which with PCBs		*t*	*0*	*0*	*0*	*0.900*

Indicators

		2008	2009	2010	2011	% ('11-'10)/'10
Electricity generation from renewables						
wind	% of total generation	100	100	100	100	0

Highlights of 2011

EN5 EN6 EN18 Enel Green Power France commissioned the following wind farms (net maximum capacity: 64 MW):

> Sources de la Loire (Saint Cirgues-en-Montagne municipality, Ardèche department);
> Coulonges (Coulonges-Thouarsais, La Chapelle-Gaudin and Noirterre municipalities, Deux Sèvres department, Poitou-Charentes region);
> Moulin à Vent (Nogent-sur-Seine, Aube department, Champagne-Ardenne region).

In the next few years, Enel Green Power will capture additional development opportunities in France thanks to a pipeline of hydro, solar and wind projects totaling more than 1,000 MW.

EN18 Wind power generation displaced about 160,000 t of CO_2 emissions into the atmosphere thanks to a proportional increase of generation.

Enel operates in France through Enel Green Power (wind power generation).

EN26 Environmental enhancements.

Noise

> Systematic noise abatement activity, with targets to be reached also in 2012. Noise abatement measures in the Pannecé wind farm reduced noise immissions.

Waste

> Introduction of a separate waste collection scheme in offices.

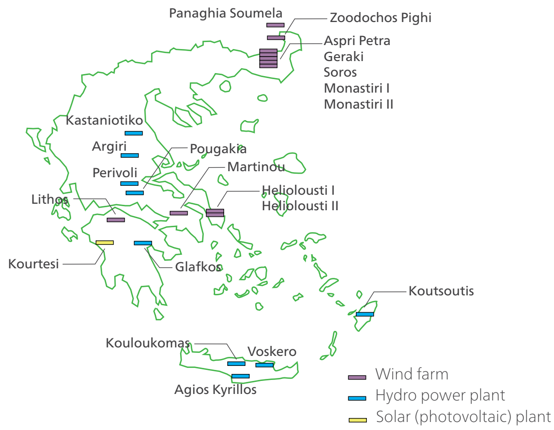
Other

> The impacts of each wind farm are being analyzed with a view to defining mitigative measures and environmental enhancements.

Greece

Hydro, wind and solar (photovoltaic) power generation

Enel Produzione SpA
Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
20	191	349

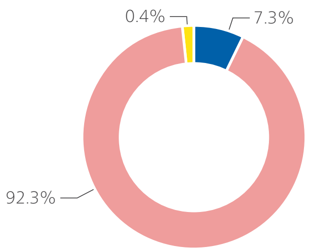
Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	**4**	**0**	**14**

WIND	Power plants no.	Net maximum electrical capacity MW
	15	**172**

SOLAR PHOTOVOLTAIC	Power plants no.	Net maximum electrical capacity MW
	1	**5**

Net electricity generation
Total: 349 million kWh



- Hydro from natural flows
- Wind
- Solar (photovoltaic)

Equivalent yearly hours of utilization*

Hydro: **1,870 hours**
Wind: **1,872 hours**
Solar (photovoltaic): **298 hours**

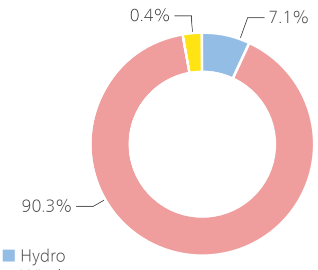
* Yearly generation/capacity ratio.

Expendables
Total: 3.47 t

Other data

Wind generation
Wind systems
Surface area occupied by platforms, service roads, buildings: **98.08 ha**

Net maximum electrical capacity
Total: 191 MW



- Hydro
- Wind
- Solar (photovoltaic)

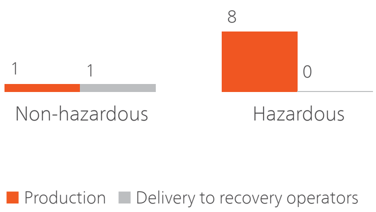
Avoided CO_2 emissions (t)

Due to hydro generation from natural flows	24,326
Due to wind generation	309,414
Due to solar (photovoltaic) generation	1,428
Total	**335,169**

Emissions from the otherwise necessary fossil-fired thermal generation.

Special waste

Total production: **9 t**
Total delivery to recovery operators: **1 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	7	16	13	16	20
hydro	no.	-	7	2	4	4
wind	no.	7	9	11	12	15
solar (photovoltaic)	no.	0	0	0	0	1
Net maximum electrical capacity	MW	79.6	107	133	143	191
hydro	MW	-	9.58	10.0	13.6	13.6
wind	MW	79.6	97.2	123	129	172
solar (photovoltaic)	MW	0	0	0	0	5
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.	-	-	7	7	0
special vehicles	no.	-	-	4	4	0
vehicles for both private and service use	no.	-	-	0	0	21

Resources

		2007	2008	2009	2010	2011
EN4 **Primary electricity**						
Various activities	million kWh	0	0	0.467	0.467	na
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0.006	0.006	na
EN1 **Expendables**						
Lubricating oil	t	0	1.53	0.500	1.22	3.47
Printing paper	t	0	0	1.25	0	0
Other	t	0	0.040	0	0	0
Total	t	0	1.57	1.75	1.22	3.47
for hydro generation	t	0	0	0.500	0.760	1.40
for wind generation	t	0	1.57	0	0.462	2.07

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables	million kWh	53.5	243	262	310	349
hydro from natural flows	million kWh	0	2.81	17.1	27.7	25.3
wind	million kWh	53.5	240	245	282	322
solar (photovoltaic)	million kWh	0	0	0	0	1.49

na: not available.

Emissions

	Source		2007	2008	2009	2010	2011
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	0	2.70	16.4	26.6	24.3
Due to wind and solar (photovoltaic) generation		thousand t	51.3	230	235	271	311
Due to generation from renewables		**thousand t**	**51.3**	**233**	**251**	**297**	**335**
EN22 Non-hazardous special waste	electricity generation						
production		t	0.200	5.24	1.52	1.18	0.801
delivery to recovery operators		t	0	4.76	0.600	0.261	0.621
EN22 Hazardous special waste	electricity generation						
production		t	0.100	3.60	11.4	0.462	8.27
of which with PCBs		*t*	*0.100*	*1.78*	*11.4*	*0.462*	*2.07*
delivery to recovery operators		t	0	1.04	11.4	0	0
of which with PCBs		*t*	*0*	*0*	*11.4*	*0*	*0*
EN22 Total special waste	electricity generation						
production		t	0.300	8.84	13.0	1.64	9.07
delivery to recovery operators		t	0	5.80	12.0	0.261	0.621

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
hydro from natural flows	% of total generation	0	1.16	6.54	8.94	7.26	0	-18.8
wind and solar (photovoltaic)	% of total generation	100	98.8	93.5	91.1	92.7	-7.30	1.80
EN22 Waste recovery								
Other non-hazardous special waste								
electricity generation	% production	0	90.7	39.4	22.1	77.5	0	250
Other hazardous special waste								
electricity generation	% production	0	28.9	100	0	0	0	0
Total special waste								
electricity generation	% production	0	65.6	92.9	15.9	6.85	0	-56.9

Highlights of 2011

EN5 EN6 EN18 Enel Green Power Hellas commissioned the following renewable power plants (net maximum capacity: 48 MW):

> the first photovoltaic plant in the Ilia region (Peloponnese, western Greece), with an overall capacity of 4.9 MW;
> the wind farm of Kouloukonas (Rethimnon, island of Crete);
> the two wind farms of Zoodochos Pighi and Panaghia Soumela (in Kozani and Veria, both in Macedonia, respectively);
> the wind farm in the areas of Chlogos and Profeta Elias (near Corinth, north-eastern Peloponnese, Greece).

EN18 Electricity generation from renewables (hydro, wind and photovoltaic plants) displaced about 335,000 tonnes of CO_2 emissions into the atmosphere, thanks to a corresponding increase in generation.

EN26 Environmental enhancements.

Water

> Water quality monitoring to detect leakage of oils and other substances.

Waste

> Increase in waste recovery.

Other

> In 2011, Enel Green Power Hellas gained the ISO 14001 certification for all of its activities. In wind farm sites, avian-fauna monitoring programs are under way.

Enel operates in Greece through Enel Green Power (hydro, wind and solar photovoltaic power generation).

Ireland

Thermal power generation

Endesa SA

Fuel oil- and gas oil-fired thermal power plant

The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
4	1,013	70

Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW
Steam (condensing)	3	7	813
Single-cycle gas turbines	1	4	200
	4	**11**	**1,013**

The four power plants (total capacity 1,013 MW) have an ISO 14001-certified environmental management system in place.

Net electricity generation

Total: 70 million kWh

Water for industrial uses

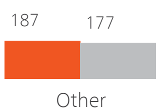
Total requirements: 123,709 m^3

Total abstraction from inland waters: 123,709 m^3

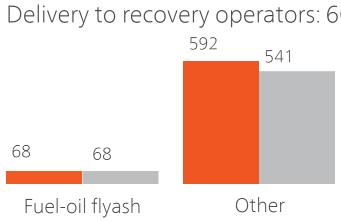
Special waste

Total production: **847 t**
Total delivery to recovery operators: **786 t**

Non-hazardous
Production: 187 t
Delivery to recovery operators: 177 t



Hazardous
Production: 660 t
Delivery to recovery operators: 609 t



Production Delivery to recovery operators

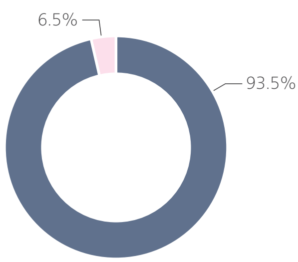
Waste waters

Discharged: 140,300 m^3

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

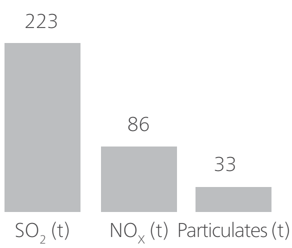
Fuel consumption

Total: 20,909 toe



Fuel oil
Gas oil

Emissions into the atmosphere



CO_2: **69,768 t**

Environmental Results

Status data

		2009	2010	2011
Power-generating installations				
Power plants (thermal)	no.	4	4	4
Net maximum electrical capacity (thermal)	MW	1,068	1,013	1,013

Resources

		2009	2010	2011
EN1 EN3 **Fossil fuels**				
Thermal generation				
fuel oil	thousand t	171	83.7	20.5
	thousand toe	163	80.0	19.5
MS	*thousand t*	*0*	*71.5*	*0*
	thousand toe	*0*	*68.3*	*0*
LS	*thousand t*	*0*	*12.2*	*20.5*
	thousand toe	*0*	*11.7*	*19.5*
VLS	*thousand t*	*171*	*0*	*0*
	thousand toe	*163*	*0*	*0*
gas oil	thousand t	3.16	2.86	1.36
	thousand toe	3.19	2.89	1.36
Total	thousand toe	166	82.9	20.9
	TJ	6,960	3,469	875
EN8 **Water for industrial uses**				
From wells	million m^3	0	0.002	0.001
From aqueducts	million m^3	0.418	0.253	0.123
Total abstraction from inland waters	million m^3	0.418	0.255	0.124
for thermal generation	million m^3	0.418	0.255	0.124
EN8 EN21 **Open-cycle cooling water**				
Thermal generation	million m^3	222	128	48
EN1 **Expendables**				
Hydrazine	t	0	0	2.60
Ammonia	t	0	0	6.50
Sodium hypochlorite	t	0	0	2.50
Sulfuric & hydrochloric acids	t	0	0	75.0
Caustic soda	t	0	0	80.0
Total	t	0	0	167
for thermal generation	t	0	0	167

Processes and products

		2009	2010	2011
Electricity generation (net)				
From fossil fuels	million kWh	627	300	69.7

Emissions

	Source		2009	2010	2011
Emissions into the atmosphere					
EN20 SO_2	thermal generation	thousand t	2.80	1.35	0.223
EN20 NO_X	thermal generation	thousand t	1.20	0.504	0.086
EN20 Particulates	thermal generation	thousand t	0.272	0.227	0.033
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	552	275	69.8
EN21 **Waste waters (discharged quantity)**	thermal generation	million m^3	0.011	0.011	0.140
EN22 **Non-hazardous special waste**					
Oil bottom ash	thermal generation				
production		t	63.0	0	0
Other	electricity generation				
production		t	391	221	187
delivery to recovery operators			80.0	147	177
Total	**electricity generation**				
production		**t**	**454**	**221**	**187**
delivery to recovery operators		**t**	**80.0**	**147**	**177**
EN22 **Hazardous special waste**					
Oil flyash	electricity generation				
production		t	0	60.0	67.7
delivery to recovery operators		t	0	0	67.7
Other	electricity generation				
production		t	850	226	592
of which with PCBs		*t*	*194*	*95.0*	*39.2*
delivery to recovery operators		t	194	149	541
of which with PCBs		*t*	*194*	*55.2*	*39.2*
Total	**electricity generation**				
production		**t**	**850**	**286**	**660**
delivery to recovery operators		**t**	**194**	**149**	**609**
EN22 **Total special waste**	electricity generation				
production		t	1,304	507	847
delivery to recovery operators		t	274	296	786

Indicators

		2009	2010	2011	% ('11-'10)/'10
Resource conservation and quality					
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	2,651	2,763	3,000	8.60
EN8 Net specific requirements of water for industrial uses in thermal generation					
including contribution of as-is sea water	liters/kWh	0.667	0.850	1.78	109
excluding contribution of as-is sea water	liters/kWh	0.667	0.850	1.78	109
EN8 Coverage of requirements of water for industrial uses					
from wells	% of requirements	0	0.784	0.806	2.80
from aqueducts	% of requirements	100	99.2	99.2	0
Total from inland waters	**% of requirements**	**100**	**100**	**100**	**0**
EN1 EN3 Fossil fuel consumption for thermal generation					
fuel oil	% of total fuel consumption	98.1	96.5	93.5	-3.10
gas oil	% of total fuel consumption	1.92	3.49	6.52	86.8
MS fuel oil	% of total fuel oil consumption	0	85.4	0	-100
LS fuel oil	% of total fuel oil consumption	0	14.6	100	584
VLS fuel oil	% of total fuel oil consumption	100	0	0	0

		2009	2010	2011	% ('11-'10)/'10
Specific emissions into the atmosphere					
EN20 SO_2 (thermal generation)	g/kWh thermal net	4.47	4.51	3.20	-29.0
EN20 NO_X (thermal generation)	g/kWh thermal net	1.92	1.68	1.23	-26.8
EN20 Particulates (thermal generation)	g/kWh thermal net	0.434	0.757	0.473	-37.5
EN16 CO_2 (thermal generation)	g/kWh thermal net	880	917	1,001	9.20
EN22 **Specific waste production**					
Oil flyash (thermal generation)	g/kWh net from fuel oil & gas oil	0	0.200	0.971	385
Oil bottom ash (thermal generation)	g/kWh net from fuel oil & gas oil	0.100	0.200	0.971	385
EN22 **Waste recovery**					
Other non-hazardous special waste electricity generation	% production	17.6	66.6	94.5	41.9
Oil flyash	% production	0	0	100	0
Other hazardous special waste electricity generation	% production	22.8	66.0	91.4	38.5
Total special waste electricity generation	% production	21.0	58.5	92.8	58.6

Highlights of 2011

The levels of electricity generation dropped significantly (from about 300 GWh in 2010 to about 70 GWh in 2011).

EN16 EN20 Specific emissions of macro-pollutants (NO_X, SO_2 and particulates) declined, while those of CO_2 rose slightly; the rise is to be ascribed to a higher heat rate due to extremely low levels of generation.

EN23 Great Island: 0.6 m^3 of fuel oil spilled from the burner of unit 3. The episode did not cause any impact as the fuel did not disperse into the environment.

Enel operates in Ireland through Endesa (thermal power generation).

EN26 Environmental enhancements.

Waste

> Increase in waste recovery.

Soil

> Yearly inspection of buried tanks and sewage systems to prevent soil contamination.

Noise

> Great Island: yearly noise monitoring survey to check compliance with applicable limits.

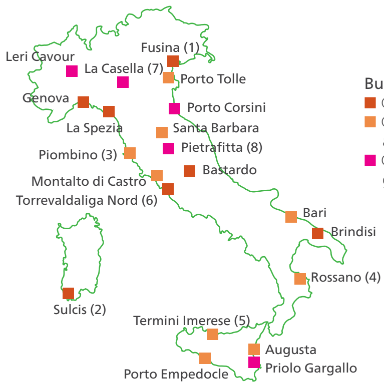
Other

> Training courses on environmental management systems, waste management, emergency readiness, internal auditing, legislation and use of chemicals.

Italy

Thermal power generation

Enel Produzione SpA



Business Unit
- Generation from coal
- Generation from fuel oil and gas
- Combined-cycle and gas-turbine generation

Power plants
GEOTHERMAL
(1) Fusina, Porto Marghera.
(2) Sulcis, Portoscuso , Assemini.
(3) Piombino, Livorno, Portoferraio, Capraia.
(4) Rossano, Mercure.
(5) Termini Imerese, Alicudi, Filicudi, Malfa, Panarea, Santa Marina Salina, Stromboli, Vulcano.
(6) Torrevaldaliga Nord, Ventotene.
(7) La Casella , Alessandria , Carpi.
(8) Pietrafitta, Camerata Picena, Campomarino, Giugliano, Larino, Maddaloni.

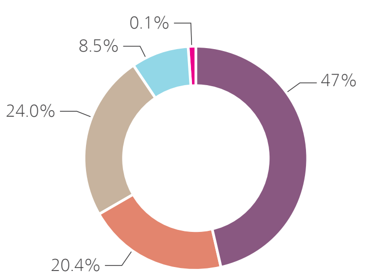
The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
43	24,824	50,041

Power installations

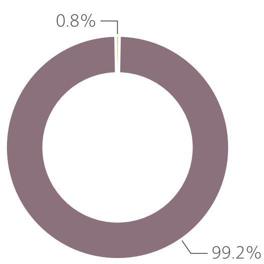
	Power plants no.	Units no.	Net maximum electrical capacity MW
Steam (condensing)	16	44	11,656
Steam repowered with gas turbines	2	8	5,068
Combined-cycle gas turbines	7	15	5,964
Gas turbines	9	27	2,107
Diesel engines	9	40	29
	43	**134**	**24,824**

Net maximum electrical capacity
Total: 24,825 MW



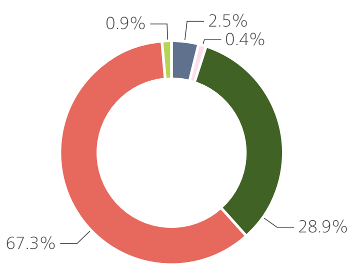
- Steam (condensing)
- Steam repowered with gas turbines
- Combined-cycle gas turbines
- Gas turbines
- Diesel engines

Net electricity generation
Total: 50,041 million kWh



- From fossil fuels
- From biomass & waste

Fuel consumption
Total: 10,954,775 t of oil-equivalent



- Fuel oil
- Gas-oil
- Natural gas
- Coal
- Biomass & waste

Waste waters

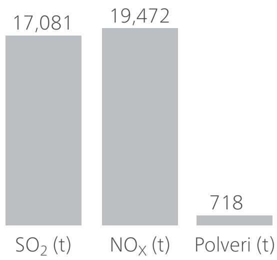
Discharged: **6,792,708 m³**
Used inside plants: **5,045,308 m³**

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

Avoided CO_2 emissions

Electricity generation from biomass and biodegradable fraction of waste: **256,410 t**

Emissions into the atmosphere

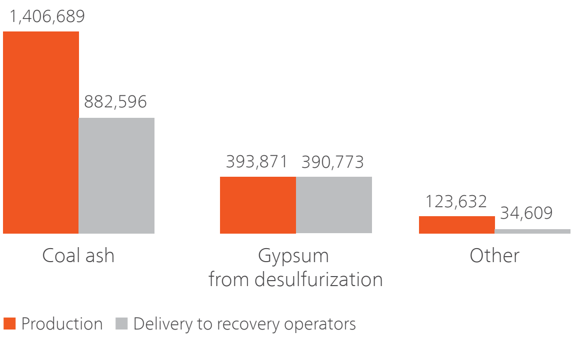


CO_2 (t)	36,844,733
from combustion	*36,686,493*
from desulfurization (computed stoichiometrically)	*159,240*
SF_6 (kg)	1,388.75
(t of CO_{2eq})	equal to 30,830.25
Total (t of CO_{2eq})	36,876,823.34

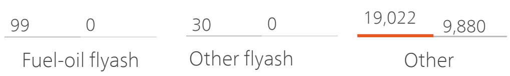
Special waste

Total production: **1,943,107 t**
Total delivery to recovery operators: **1,317,803 t**

Non-hazardous
Production: 1,924,430 t
Delivery to recovery operators:1,308,215 t

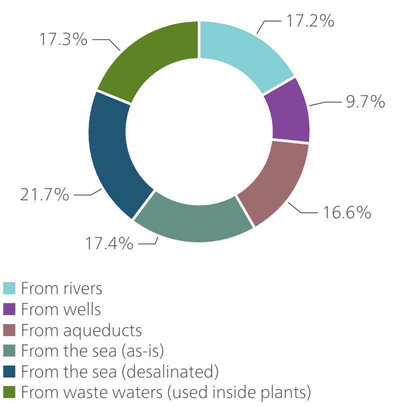


Hazardous
Production: 19,043 t
Delivery to recovery operators: 9,867 t



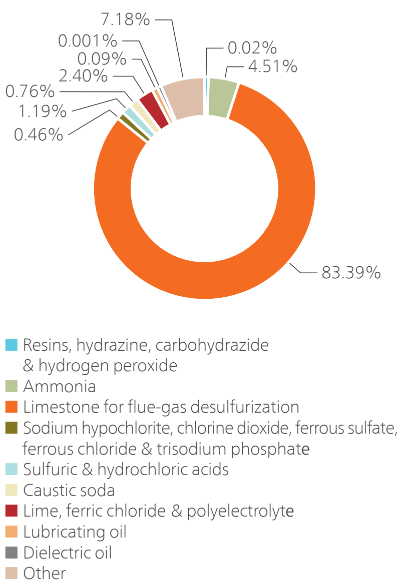
Water for industrial uses

Total requirements: 29,073,339 m³
Total abstraction from inland waters: 12,666,810 m³



Expendables

Total: 385,785 t



Fuel oil storage & handling

The Thermal Generation Business Area operates an integrated fuel oil storage & handling facility in Ravenna. The facility (IICO), which is equipped with pumping and heating systems, supplies fuel oil via a pipeline to the Porto Tolle power plant.

Overall length of supply pipelines, from sea terminal and from AGIP dock: **28 km**
Capacity of storage tanks: **183,630 m³**
Length of transfer pipeline to Porto Tolle: **92 km**
Fuel oil transferred to Porto Tolle: **15,216 t**
Heat generation - 15 bar and 210°C steam: **4,550 million kcal**
Electricity consumption: **1 million kWh**

In the following pages, the other flow data (consumption of natural gas and gas oil, expendables, water for industrial uses, waste waters, emissions into the atmosphere and into water bodies, waste) are included among the thermal generation data

Italy

Electricity generation from renewables

Enel Produzione SpA
Enel Green Power SpA

Enel Green Power SpA:
- Operation & Maintenance, hydro, solar and wind plants
- Operation & Maintenance, geothermal plants

Enel Produzione SpA:
Business Unit
- Hydro generation, Alps
- Hydro generation, Apennines

The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
560	15,057	28,387

GEO	Power plants no.	Generating units no.	Net maximum electrical capacity MW
Condensing	32	34	722
Atmospheric exhaust	1	1	6
	33	**35**	**728**

465 plants (15,030 MW) – of which 392 hydro, 25 wind, 33 geothermal and 15 solar photovoltaic plants – have an ISO 14001-certified environmental management system in place; 180 of them (8,307 MW) are also EMAS-registered.

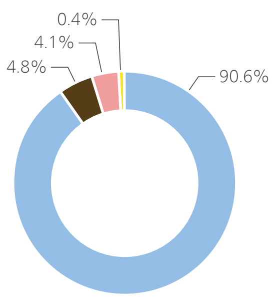
Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	298	317	1,786
Pondage/reservoir	167	177	4,617
Pure/mixed pumped storage	18	19	7,244
	483	**513**	**13,647**

WIND	Power plants no.	Net maximum electrical capacity MW
	29	**623**

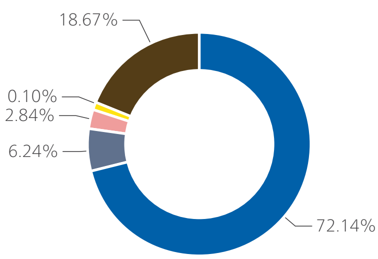
SOLAR PHOTOVOLTAIC	Power plants no.	Net maximum electrical capacity MW
	15	**65**

Net maximum electrical capacity
Total: 15,057 MW



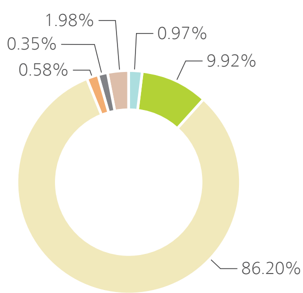
- Hydro
- Geothermal
- Wind
- Solar photovoltaic

Net electricity generation
Total: 28,387 million kWh



- Hydro from natural flows
- Hydro from pumped storage
- Wind
- Solar photovoltaic
- Geothermal

Expendables
Total: 32,157 t



- Hydrochloric acid
- Bentonite, barite and geothermal cement
- Caustic soda
- Lubricating oil
- Dielectric oil
- Other

Equivalent yearly hours of utilization*

7,339 geo

3,199 hydro

1,294 wind

450 solar photovoltaic

* Yearly generation/capacity ratio (excluding hydro from pumped storage).

Avoided CO_2 emissions (t)

Hydro generation from natural flows	15,078,700
Geothermal generation	3,902,313
Wind generation	593,648
Solar photovoltaic generation	21,636
Total	**19,596,499**

Avoided CO_2 emissions from the otherwise necessary fossil-fired thermal generation. The contribution of geothermal generation has been calculated on the assumption that the related CO_2 emissions are of natural origin.

Emissions into the atmosphere

SF_6 - all types of generation (kg)	387
(t of CO_{2eq})	8,592
CO_2 (t)	7,698
Carbon dioxide emissions from gas oil combustion.	
H_2S - from geothermal fluid (t)	9,174
CO_2 - from geothermal fluid (t)	1,804,000

A large debate is under way on the natural or anthropogenic origin of emissions of incondensible gases from geothermal fluid.

Geothermal fluid

Total fluid extracted: 50,370,180 t

net of reinjected liquids: **26,877,980 t**

Steam used for electricity generation: 43,951,050 t

Fluid used for supply of heat: 632,230 t

directly: **412,230 t**

after utilization for electricity generation: **220,000 t**

Geothermal fluid may not have or may have lost the thermodynamic properties that make it suitable for geothermal generation. In this case, the fluid is used for supply of heat, especially for greenhousing and district heating.

Water for industrial uses

46,840 m^3

Abstraction from inland waters (from rivers only)

Gas oil

2,500 toe

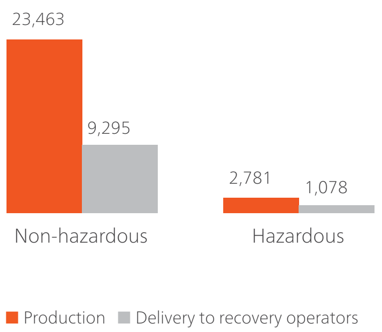
Total consumption

Used for driving the drilling equipment and, to a much lesser extent, for feeding emergency generating sets.

Special waste

Total production: **26,244 t**

Total delivery to recovery operators: **10,372 t**



Other data

Hydro

Emptied reservoirs

Quantity: **9**

Alluvial sediments removed by flushing them out through bottom outlets: **140,448 m^3**

Alluvial sediments removed by mechanical equipment: **50,695 m^3**
(of which reused locally: **50,695 m^3**)

Fish ladders: 41

Fish restocking campaigns

Quantity: **60**

Restocked fish:
2,745,131 individuals
in addition to **2,911 kg**

Geothermal activities

Drilled wells

New: **4**

Rehabilitated: **6**

Extent of drilling: 19,062 m

In-service wells: 486

for steam production: 312

for reinjection: 69

for other uses: 105

Wind & solar photovoltaic generation

Wind systems

Surface area occupied by platforms, service roads, buildings: **92 ha**

Total surface area affected by the installations:

from 20 to 100 times larger

Photovoltaic solar systems

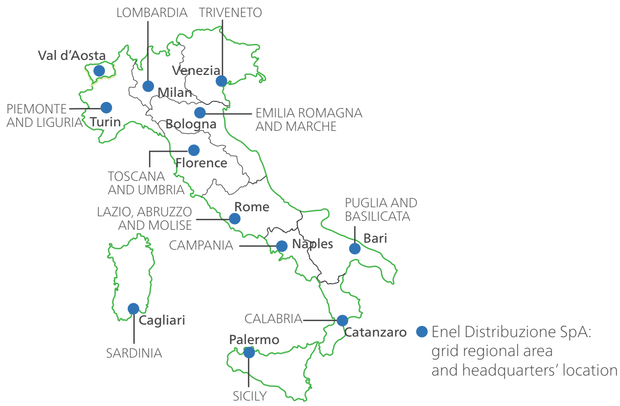
Surface area occupied by modules: **12 ha**

Total surface area affected by the installations:
12 ha

Italy

Electricity distribution

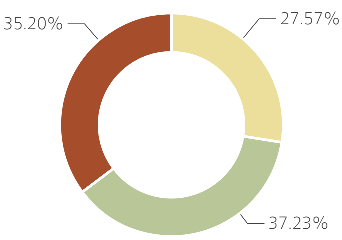
Enel Distribuzione SpA



The Numbers

Substations no.	Capacity (MVA)	Lines (km)
568,032	188,918	1,112,927

Enel Distribuzione has an ISO 14001-certified environmental management system in place, which extends to its entire organization.



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	2,108	99,826
MV/LV	432,020	77,222
MV/MV	133,904	11,871
Satellite substations and MV units	486	-
	568,518	**188,919**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
MV	195,522	10,580	139,483	**345,586**
LV	111,366	403,758	252,218	**767,341**
	306,888	**414,338**	**391,701**	**1,112,927**

General data

Municipalities served: **7,539**

Surface area served: **276,324 km²**

Customers connected to the grid: **31,495,382**

(of which supplied by companies of the Group: **31,397,418**)

Resource consumption

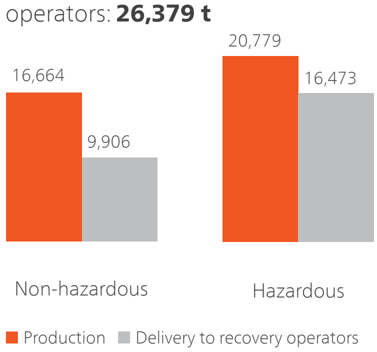
Expendables: **111 t**

Gas oil: **195 toe**

Special waste

Total production: **37,443 t**

Total delivery to recovery operators: **26,379 t**



Electricity

Total electricity distributed: **245,182 million kWh**

Own consumption for grid operation: **364 million kWh**

Emissions into the atmosphere

SF_6: **4,156 kg** (92,263 t of CO_{2eq})

CO_2: **600 t**

Total greenhouse gases: **92,863** t of CO_{2eq}

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	599	604	607	603	603
thermal	no.	43	43	43	43	43
hydro	no.	501	501	502	496	483
geothermal	no.	31	31	32	33	33
wind	no.	20	25	25	25	29
solar (photovoltaic)	no.	4	4	5	6	15
Net maximum electrical capacity	MW	40,397	40,324	40,422	40,525	39,882
thermal	MW	25,005	24,862	24,855	24,833	24,825
hydro	MW	14,401	14,424	14,431	14,417	13,647
geothermal	MW	671	671	695	728	722
wind	MW	315	362	429	533	623
solar (photovoltaic)	MW	4.52	4.20	11.6	14.1	65.3
Power lines (circuit-length)						
Total	km	1,104,980	1,112,164	1,099,683	1,109,109	1,112,927
high-voltage	km	18,930	18,952	56.5	56.6	0
medium-voltage	km	338,644	340,424	342,290	344,029	345,586
low-voltage	km	747,406	752,789	757,337	765,024	767,341
Gas pipelines						
Total	km	30,664	31,765	-	-	-
high-pressure	km	58.8	205	-	-	-
medium-pressure	km	11,766	12,342	-	-	-
low-pressure	km	18,839	19,219	-	-	-
Mining & extracting activities (1)						
Mining activities						
Mines	no.	0	3	3	3	3
Amount of fuels extractable since the start of activities	Mt	0	60.0	60.0	60.0	60.0
Areas occupied by excavations and other activities	ha	0	10.0	10.0	10.0	10.0
EN29 **Real-estate & service management** (2)						
Vehicle fleet						
service vehicles	no.	0	14,065	13,382	12,786	11,697
special vehicles	no.	0	2,244	2,218	1,832	1,645
vehicles for both private and service use	no.	0	1,019	1,031	1,080	1,152
Gross real-estate surface area	thousand m^2	1,253	1,749	1,460	1,360	1,800

-: no data due to absence of activities in the year.
(1) These activities have been surveyed since 2008.
(2) These activities have been surveyed since 2007.

Resources

		2007	2008	2009	2010	2011
EN1 EN3 Fossil fuels						
Thermal generation						
fuel oil	thousand t	1,773	1,389	910	419	276
	thousand toe	1,755	1,374	899	414	273
HS	*thousand t*	*39.2*	*0*	*0*	*0*	*0*
	thousand toe	*37.9*	*0*	*0*	*0*	*0*
MS	*thousand t*	*179*	*308*	*249*	*97.9*	*72.5*
	thousand toe	*171*	*297*	*240*	*94.7*	*70.1*
LS	*thousand t*	*456*	*249*	*173*	*86.5*	*21.8*
	thousand toe	*446*	*244*	*169*	*84.4*	*21.2*
VLS	*thousand t*	*1,098*	*832*	*488*	*235*	*182*
	thousand toe	*1,101*	*832*	*490*	*235*	*182*
gas oil	thousand t	69.9	93.4	96.1	52.1	40.9
	thousand toe	71.4	95.7	98.4	53.1	42.0
natural gas	million m^3	7,233	6,652	4,216	4,114	3,737
	thousand toe	6,134	5,639	3,579	3,494	3,166
technologically captive use	*million m^3*	*4,970*	*5,286*	*3,476*	*3,557*	*3,410*
	thousand toe	*4,206*	*4,469*	*2,950*	*3,019*	*2,887*
of which in combined-cycle units	million m^3	4,510	4,997	3,357	3,478	3,364
	thousand toe	3,813	4,221	2,847	2,951	2,848
non-technologically captive use	*million m^3*	*2,263*	*1,367*	*740*	*557*	*327*
	thousand toe	*1,928*	*1,171*	*629*	*476*	*279*
coal	thousand t	11,386	11,724	11,122	10,741	12,375
	thousand toe	6,791	6,919	6,587	6,344	7,373
coke-oven gas	million m^3	0.002	0.002	0.003	0.009	0.009
	thousand toe	0.003	0.002	0.003	0.010	0.010
Total	**thousand toe**	**14,752**	**14,027**	**11,163**	**10,306**	**10,854**
	TJ	**617,646**	**587,300**	**467,385**	**431,472**	**454,434**
Various activities	thousand toe	23.2	24.9	27.9	27.3	26.4
Grand total	**thousand toe**	**14,775**	**14,052**	**11,191**	**10,333**	**10,880**
	TJ	**618,619**	**588,343**	**468,552**	**432,617**	**455,540**
EN1 EN3 Hydrogen						
Thermal generation	thousand m^3	0	0	0	3.54	1.06
	thousand toe	0	0	0	0.881	0.263
	TJ	0	0	0	36.9	11.0
EN1 EN3 Biomass and waste						
Thermal generation						
solid biomass	t	65,427	115,905	153,842	201,406	260,439
	toe	17,458	32,271	43,983	57,825	75,814
liquid biomass	t	36.9	114	336	350	423
	toe	37.6	115	331	298	360
RDF	t	32,081	22,546	55,235	46,136	56,106
	toe	12,990	9,129	23,027	19,377	23,839
Grand total	**thousand toe**	**30.5**	**41.5**	**67.3**	**77.5**	**100**
	TJ	**1,276**	**1,738**	**2,819**	**3,245**	**4,187**
EN1 EN3 Geothermal fluid						
Total fluid extracted	thousand t	50,478	50,172	46,778	47,807	50,370
net of reinjected fluids	*thousand t*	*30,364*	*29,855*	*28,462*	*27,486*	*26,878*
Used for electricity generation	thousand t	44,215	43,931	41,385	42,495	43,951
EN4 Primary electricity						
Various activities	million kWh	127	131	130	115	115

		2007	2008	2009	2010	2011
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	9.44	8.48	7.43	5.08	5.06
From wells	million m^3	3.60	6.56	6.73	2.97	2.81
From aqueducts	million m^3	5.52	6.50	5.81	4.48	4.86
Total abstraction from inland waters	**million m^3**	**18.6**	**21.5**	**20.0**	**12.5**	**12.7**
From the sea (as-is)	million m^3	11.9	10.0	5.87	5.50	5.05
From the sea (desalinated)	million m^3	6.40	5.87	6.16	6.24	6.31
EN10 From waste waters (used inside plants)	million m^3	1.48	2.09	4.80	5.59	5.05
Total requirements	**million m^3**	**38.4**	**39.5**	**36.8**	**29.9**	**29.1**
for thermal generation	million m^3	38.3	39.1	36.7	29.8	29.1
for geothermal drilling	million m^3	0.049	0.007	0.069	0.059	0.047
for fuel storage & handling	million m^3	0.010	0.016	0.024	0.013	0.015
for mining & extracting activities	million m^3	0	0.400	0	0	0
EN8 EN21 Open-cycle cooling water						
For thermal generation (simple and CHP)	million m^3	10,531	11,729	10,460	10,235	10,164
Water for non-industrial uses						
Real-estate & service management (1)	million m^3	1.32	1.52	1.06	1.30	1.78
EN1 Expendables						
Resins	t	32.0	22.8	32.6	39.6	57.4
Hydrazine	t	0.380	0.100	0	0	0
Carbohydrazide	t	270	262	260	18.9	25.1
Hydrogen peroxide	t	83.5	46.2	0.033	0.212	0.126
Ammonia	t	19,759	17,708	18,702	14,691	17,390
Limestone for flue-gas desulfurization	t	192,376	249,858	260,830	286,619	321,696
Magnesium oxide	t	33.3	0	8.58	0	0
Sodium hypochlorite	t	1,766	2,543	1,701	1,370	1,732
Ferrous sulfate	t	0	0	6.94	4.69	0
Ferrous chloride	t	39.9	44.2	41.0	20.2	34.7
Trisodium phosphate	t	2.10	2.00	1.64	1.80	1.91
Lime	t	10,128	8,244	7,039	8,710	8,409
Ferric chloride	t	1,030	654	759	742	757
Polyelectrolyte	t	57.0	59.0	76.5	62.5	93.6
Sulfuric & hydrochloric acids	t	4,547	4,278	4,825	3,896	4,911
Caustic soda	t	15,601	16,784	26,778	26,056	30,653
Bentonite	t	549	1,696	1,359	518	937
Barite	t	0	0	211	216	0
Geothermal cement	t	2,729	3,909	3,329	2,905	2,254
Lubricating oil	t	855	7,792	13,492	890	538
Dielectric oil	t	120	554	369	147	227
Printing paper	t	1,393	1,224	1,132	1,023	938
Other	t	1,745	2,884	4,885	23,297	28,345
Total	**t**	**253,114**	**318,563**	**345,838**	**371,227**	**419,000**
for thermal generation	t	233,521	296,221	314,268	341,693	385,785
for hydro generation	t	199	253	224	209	227
for geothermal activities	t	17,832	20,660	28,665	28,185	31,924
for wind generation	t	0.600	0.600	1,341	6.5	6.49
for fuel storage & handling	t	0.047	0.105	0.533	0.266	0.407
for electricity distribution	t	78.4	113	207	98.8	111
for gas distribution	t	91.1	91.8	0	0	0
EN1 PCB survey (2)						
Equipment & transformers with PCBs > 500 ppm (excluding their oil)	t	6,634	77.5	0	0.170	0
Oil with PCBs > 500 ppm contained in equipment & transformers	t	3,346	69.8	0	0.180	0
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t	107	939	14,181	17,226	12,481
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t	214	334	3,021	3,438	2,503

(1) These activities have been surveyed since 2007.
(2) The survey began in 2007.

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**67,261**	**64,163**	**49,431**	**46,759**	**49,653**
fuel oil & gas oil	million kWh	7,023	5,259	3,405	1,481	948
natural gas	million kWh	32,852	31,208	19,254	18,759	17,449
of which in combined-cycle units	million kWh	23,273	25,828	17,047	17,540	17,045
coal	million kWh	27,386	27,696	26,772	26,520	31,256
From waste (non-biodegradable fraction)	**million kWh**	**28.8**	**21.2**	**51.9**	**30.8**	**39.4**
From hydrogen	**million kWh**	**0**	**0**	**0**	**2.17**	**0.275**
From renewables	**million kWh**	**21,487**	**26,478**	**29,437**	**30,809**	**26,963**
biomass and biodegradable fraction of waste	million kWh	84.5	135	207	266	348
simple	million kWh	84.5	135	207	266	348
geothermal	million kWh	5,243	5,181	5,000	5,030	5,300
hydro from natural flows	million kWh	15,691	20,695	23,725	24,784	20,479
wind	million kWh	468	464	499	723	806
solar (photovoltaic)	million kWh	1.34	2.94	5.82	5.86	29.4
Hydro from pumped storage	**million kWh**	**5,501**	**5,418**	**4,655**	**3,580**	**1,772**
Total	**million kWh**	**94,278**	**96,080**	**83,575**	**81,180**	**78,429**
Electricity consumption for pumping	million kWh	7,570	7,540	5,754	4,409	2,523
Fuel storage & handling						
Fuel transferred to destination	t	58,295	42,282	10,144	4,510	15,216
Heat generation	million kcal	3,858	8,700	8,700	6,769	4,550
Geothermal drilling						
Extent	m	15,225	13,130	14,824	15,498	19,062
Electricity distribution						
Electricity distributed	million kWh	257,093	260,473	241,817	245,887	246,037
EN4 Electricity consumption for grid operation	million kWh	364	365	318	332	364
Natural gas distribution						
Natural gas distributed	million m^3	3,418	3,570	-	-	-
Natural gas consumption for grid operation	million m^3	5.32	4.90	-	-	-
Natural gas losses along the grid	million m^3	22.2	23.2	-	-	-
Mining & extracting activities (1)						
Areas revegetated with plant, shrub and tree species	ha	0	0	0	841	843
Areas occupied by water bodies	ha	0	0	0	0	150
Areas occupied by infrastructure (roads, canals, aqueducts, power lines)	ha	0	0	0	2.00	2.00
Areas awaiting final restoration	ha	0	0	0	0	1,429

-: no data due to absence of activities in the year.
(1) These activities have been surveyed since 2008.

		2007	2008	2009	2010	2011
Sales						
Open market						
Residential segment						
Green offerings						
Customers	no.	0	673,370	1,364,507	1,581,542	2,105,968
Power sold	million kWh	0	1,290	3,032	5,258	6,138
Time-of-use offerings						
Customers	no.	37,492	224,450	183,328	286,920	232,004
Power sold	million kWh	17.0	512	847	781	676
Total						
Customers	no.	233,648	902,126	1,603,426	2,359,385	2,779,536
Power sold	million kWh	106	2,345	4,099	6,418	8,102
Business segment						
Green offerings						
Customers	no.	196,181	204,024	367,527	407,884	190,630
Power sold	million kWh	1,063	3,230	3,950	5,901	3,874
Time-of-use offerings						
Customers	no.	18,305	168,350	569,160	690,034	861,974
Power sold	million kWh	6,316	17,600	16,770	17,221	17,517
Total						
Customers	no.	962,753	995,287	1,057,383	1,125,473	1,091,372
Power sold	million kWh	19,885	27,495	25,789	23,691	22,179
Large customers' segment						
Green offerings						
Customers	no.	6	16	7,925	5,612	654
Power sold	million kWh	0.141	80	986	126	94.1
Time-of-use offerings						
Customers	no.	3,635	27,434	38,109	46,514	46,843
Power sold	million kWh	7,693	8,020	8,068	7,397	5,583
Total						
Customers	no.	21,356	31,377	52,373	58,475	50,854
Power sold	million kWh	8,624	9,015	9,733	7,679	5,983
Very large customers' segment						
Total						
Customers	no.	99	101	133	88	33
Power sold	million kWh	13,543	15,375	14,402	6,154	5,071
Universal-service market						
Household customers' segment						
Time-of-use offerings						
Customers	no.	689,740	164,127	178,917	7,120,327	19,716,896
Power sold	million kWh	2,758	584	599	17,294	44,908
Total						
Customers	no.	23,816,519	23,479,632	22,750,962	21,883,251	20,849,634
Power sold	million kWh	52,952	52,199	49,193	46,639	47,738
Non-household customers' segment						
Time-of-use offerings						
Customers	no.	316	574	3,077,277	3,844,711	3,846,194
Power sold	million kWh	24.5	1.20	15,121	18,556	20,914
Total						
Customers	no.	5,473,851	4,712,437	4,435,542	4,287,945	4,149,267
Power sold	million kWh	34,743	24,578	22,080	21,124	22,692
Overall power sold						
high-voltage	million kWh	18,418	17,763	15,148	6,520	5,449
medium-voltage	million kWh	22,069	21,129	18,645	15,318	11,696
low-voltage	million kWh	101,420	110,364	104,832	102,009	96,755
Total	**million kWh**	**141,907**	**149,256**	**138,625**	**123,847**	**113,900**
Total RECS certificates canceled	no. (MWh)	1,066,000	4,600,000	7,968,119	11,148,877	10,106,362

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	45.2	34.5	26.1	18.5	17.1
EN20 NO_X	thermal generation	thousand t	35.2	31.8	24.7	19.3	19.5
	fuel storage & handling	thousand t	0.001	0.002	0.002	0	0.001
	Total	**thousand t**	**35.2**	**31.8**	**24.7**	**19.3**	**19.5**
EN20 Particulates	thermal generation	thousand t	1.64	1.51	1.20	0.951	0.718
EN16 CO_2	*fossil-fired thermal generation (from combustion)*	*thousand t*	*46,657*	*44,290*	*36,905*	*34,126*	*36,645*
	fossil-fired thermal generation (from desulfurization)	*thousand t*	*84.6*	*109*	*114*	*135*	*159*
	total from fossil-fired thermal generation	thousand t	46,742	44,399	37,019	34,261	36,804
	non-fossil-fired thermal generation (from fossil carbon)	thousand t	23.0	16.2	39.7	33.1	40.3
	Total from thermal generation	thousand t	46,765	44,415	37,059	34,294	36,845
	various activities	thousand t	80.8	83.4	82.4	81.4	77.8
	Total	**thousand t**	**46,846**	**44,498**	**37,141**	**34,376**	**36,923**
EN16 SF_6	electricity generation	kg	1,819	1,562	1,080	1,376	1,776
		thousand t of CO_2 equivalent	41.5	35.6	24.6	31.4	40.5
	electricity distribution	kg	3,004	3,319	4,023	4,102	4,156
		thousand t of CO_2 equivalent	68.5	75.7	91.7	93.5	94.8
	Total	**kg**	**4,823**	**4,881**	**5,103**	**5,478**	**5,932**
		thousand t of CO_2 equivalent	**110**	**111**	**116**	**125**	**135**
EN16 CH_4	gas distribution, mining & extracting activities	thousand t	14.8	15.5	0	0	0
		thousand t of CO_2 equivalent	370	387	0	0	0
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**47,326**	**44,996**	**37,258**	**34,500**	**37,058**
EN20 H_2S	geothermal generation (fluid)	thousand t	16.2	13.1	10.2	10.4	9.17
EN16 CO_2	geothermal generation (fluid)	thousand t	1,953	1,902	1,876	1,829	1,804
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	10,891	14,291	17,694	18,062	15,079
Due to geothermal generation		thousand t	3,639	3,578	3,729	3,665	3,902
Due to wind and solar (photovoltaic) generation		thousand t	325	322	377	531	615
Due to generation from biomass & biodegradable fraction of waste		thousand t	58.6	93.6	154	194	256
Due to generation from hydrogen		thousand t	0	0	0	1.58	0.202
Due to generation from renewables		**thousand t**	**14,914**	**18,284**	**21,954**	**22,452**	**19,853**
EN21 Waste waters (discharged quantity)	thermal generation	million m^3	13.6	11.4	9.04	7.75	6.77
	fuel storage & handling	million m^3	0.034	0.031	0.037	0.014	0.021
	Total	**million m^3**	**13.7**	**11.4**	**9.08**	**7.76**	**6.79**

	Source		2007	2008	2009	2010	2011
EN21 Conventional polluting load of waste waters discharged by plants							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	4,232	2,333	3,372	4,114	2,042
	in some plants with an overall capacity of	MW	22,106	23,890	21,541	20,021	20,011
	fuel storage & handling	kg	12.0	12.2	7.70	4.00	11.2
	Total	**kg**	**4,244**	**2,346**	**3,380**	**4,118**	**2,053**
Total nitrogen (expressed as N)	thermal generation	kg	118,131	66,818	40,525	30,797	26,194
	in some plants with an overall capacity of	MW	22,106	23,890	23,988	20,021	20,011
	fuel storage & handling	kg	47.3	16.9	12.6	45.0	26.2
	Total	**kg**	**118,178**	**66,835**	**40,538**	**30,842**	**26,220**
Total phosphorus (expressed as P)	thermal generation	kg	8,300	7,268	5,221	3,419	1,273
	in some plants with an overall capacity of	MW	20,522	21,580	19,232	18,531	18,605
	fuel storage & handling	kg	6.15	1.83	1.85	3.00	3.31
	Total	**kg**	**8,306**	**7,269**	**5,223**	**3,422**	**1,276**
COD	thermal generation	kg	351,702	259,942	245,687	212,591	164,177
	in some plants with an overall capacity of	MW	22,106	23,890	21,541	20,021	19,817
	fuel storage & handling	kg	325	38.5	132	375	315
	Total	**kg**	**352,027**	**259,981**	**245,819**	**212,966**	**164,493**
BOD	thermal generation	kg	81,207	66,976	60,861	51,988	45,414
	in some plants with an overall capacity of	MW	15,073	16,864	17,223	16,434	16,425
	fuel storage & handling	kg	345	12.2	52.9	119	98.9
	Total	**kg**	**81,551**	**66,989**	**60,914**	**52,107**	**45,512**
EN22 Non-hazardous special waste							
Coal bottom ash	thermal generation						
production		t	23,606	14,855	31,714	34,861	59,989
delivery to recovery operators		t	24,325	14,519	28,876	33,016	60,021
Coal flyash	thermal generation						
production		t	1,290,650	1,440,304	1,280,130	1,223,299	1,346,700
delivery to recovery operators		t	1,079,355	1,258,693	1,067,575	1,030,514	822,574
Oil bottom ash	thermal generation						
production		t	24.4	0	0	0	0
Other non-hazardous ash	thermal generation						
production		t	0	0	2.75	0	0
Gypsum from desulfurization	thermal generation						
production		t	260,341	322,667	291,901	320,489	393,871
delivery to recovery operators		t	258,884	300,060	294,916	307,579	390,773
Other							
production	electricity generation & geothermal drilling	t	157,254	129,539	171,146	158,616	147,094
	electricity distribution	t	30,847	24,345	15,389	15,428	20,779
	various activities	t	278	1,104	1,663	1,942	848
	Total	**t**	**188,380**	**154,988**	**188,197**	**175,987**	**168,722**
delivery to recovery operators	electricity generation & geothermal drilling	t	101,316	80,837	59,084	65,174	43,903
	electricity distribution	t	30,331	23,480	14,350	13,667	16,473
	various activities	t	273	1,058	1,660	1,791	752
	Total	**t**	**131,920**	**105,375**	**75,094**	**80,632**	**61,128**
Total							
production	**electricity generation & geothermal drilling**	**t**	**1,731,875**	**1,907,365**	**1,774,893**	**1,737,265**	**1,947,655**
	electricity distribution	**t**	**30,847**	**24,345**	**15,389**	**15,428**	**20,779**
	various activities	**t**	**278**	**1,104**	**1,663**	**1,942**	**848**
	Total	**t**	**1,763,001**	**1,932,814**	**1,791,945**	**1,754,635**	**1,969,282**
delivery to recovery operators	**electricity generation & geothermal drilling**	**t**	**1,463,880**	**1,654,110**	**1,450,451**	**1,436,283**	**1,317,272**
	electricity distribution	**t**	**30,331**	**23,480**	**14,350**	**13,667**	**16,473**
	various activities	**t**	**273**	**1,058**	**1,660**	**1,791**	**752**
	Total	**t**	**1,494,485**	**1,678,647**	**1,466,461**	**1,451,741**	**1,334,496**

	Source		2007	2008	2009	2010	2011
EN22 Hazardous special waste							
Oil flyash production	thermal generation	t	1,811	868	369	383	98.7
delivery to recovery operators		t	118	0	0	0	0
Other ash production	thermal generation	t	0	0	0	0	30.4
Other production	electricity generation & geothermal drilling	t	13,011	11,772	35,671	39,979	21,803
	electricity distribution	t	22,864	20,536	14,314	15,601	16,664
	various activities	t	756	892	12.4	61.6	35.4
	Total	**t**	**36,630**	**33,200**	**49,997**	**55,641**	**38,503**
of which with PCBs	*electricity generation & geothermal drilling*	*t*	*2,246*	*726*	*918*	*911*	*684*
	electricity distribution	*t*	*1,223*	*818*	*426*	*416*	*443*
	various activities	*t*	*0*	*0.640*	*0*	*0*	*0*
	Total	***t***	***3,470***	***1,545***	***1,344***	***1,327***	***1,127***
delivery to recovery operators	electricity generation & geothermal drilling	t	1,732	1,748	1,809	1,415	10,957
	electricity distribution	t	12,289	12,899	10,960	10,916	9,906
	various activities	t	2.35	16.7	2.05	2.43	5.62
	Total	**t**	**14,023**	**14,664**	**12,771**	**12,334**	**20,869**
of which with PCBs	*electricity generation & geothermal drilling*	*t*	*836*	*717*	*796*	*923*	*553*
	electricity distribution	*t*	*1,112*	*721*	*424*	*397*	*431*
	Total	***t***	***1,949***	***1,438***	***1,220***	***1,320***	***984***
Total production	**electricity generation & geothermal drilling**	**t**	**14,822**	**12,639**	**36,039**	**40,361**	**21,932**
	electricity distribution	**t**	**22,864**	**20,536**	**14,314**	**15,601**	**16,664**
	various activities	**t**	**756**	**892**	**12.4**	**61.6**	**35.4**
	Total	**t**	**38,442**	**34,068**	**50,366**	**56,024**	**38,632**
delivery to recovery operators	**electricity generation & geothermal drilling**	**t**	**1,850**	**1,748**	**1,809**	**1,415**	**10,957**
	electricity distribution	**t**	**12,289**	**12,899**	**10,960**	**10,916**	**9,906**
	various activities	**t**	**2.35**	**16.7**	**2.05**	**2.43**	**5.62**
	Total	**t**	**14,141**	**14,664**	**12,771**	**12,334**	**20,869**
EN22 Total special waste							
production	electricity generation & geothermal drilling	t	1,746,697	1,920,004	1,810,933	1,777,626	1,969,587
	electricity distribution	t	53,711	44,881	29,703	31,030	37,443
	various activities	t	1,034	1,996	1,675	2,003	884
	Total	t	1,801,442	1,966,881	1,842,311	1,810,659	2,007,914
delivery to recovery operators	electricity generation & geothermal drilling	t	1,465,730	1,655,858	1,452,260	1,437,698	1,328,229
	electricity distribution	t	42,620	36,379	25,310	24,584	26,379
	various activities	t	275	1,075	1,662	1,793	757
	Total	t	1,508,626	1,693,311	1,479,232	1,464,075	1,355,365

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	52.4	52.6	52.6	52.6	52.6	0.400	0
underground	% of entire LV grid	31.7	32.2	32.7	32.7	32.9	3.80	0.600
Total	**% of entire LV grid**	**84.1**	**84.8**	**85.3**	**85.3**	**85.5**	**1.70**	**0.20**
MV cable lines								
overhead	% of entire MV grid	2.53	2.60	2.72	2.79	3.06	20.9	9.70
underground	% of entire MV grid	38.4	38.8	39.2	39.5	40.4	5.20	2.30
Total	**% of entire MV grid**	**40.9**	**41.4**	**41.9**	**42.3**	**43.4**	**6.10**	**2.60**
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	69.4	70.1	71.8	72.0	72.4	4.30	0.600
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation (simple)	kcal/kWh	2,193	2,186	2,258	2,204	2,186	-0.300	-0.800
EN1 EN3 Net heat rate of geothermal generation	kcal/kWh	5,415	5,473	5,344	5,459	5,356	-1.10	-1.90
EN1 EN3 Net efficiency of hydro generation from pumped storage	%	72.7	71.9	80.9	81.2	70.3	-3.30	-13.4
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.142	0.140	0.131	0.135	0.148	4.20	9.60
EN1 EN3 Consumption of natural gas for grid operation	% of natural gas distributed	0.156	0.137	-	-	-	-	-
Natural gas losses along the grid	% of natural gas distributed	0.650	0.650	-	-	-	-	-
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.569	0.608	0.739	0.633	0.581	2.10	-8.20
excluding contribution of as-is sea water	liters/kWh	0.392	0.452	0.621	0.516	0.480	22.4	-7.00
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	24.6	20.7	20.2	17.0	17.4	-29.3	2.40
from wells	% of requirements	9.39	16.8	18.3	9.95	9.66	2.90	-2.90
from aqueducts	% of requirements	14.4	16.6	15.8	15.0	16.7	16.0	11.3
Total from inland waters	**% of requirements**	**48.4**	**54.0**	**54.3**	**42.0**	**43.7**	**-9.70**	**4.00**
from the sea (as-is)	% of requirements	31.1	25.6	16.0	18.4	17.3	-44.4	-6.00
from the sea (desalinated)	% of requirements	16.7	15.0	16.7	20.9	21.7	29.9	3.80
EN10 from waste waters (used inside plants)	% of requirements	3.85	5.34	13.0	18.7	17.3	349	-7.50

-: no data due to absence of activities in the year.

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	11.9	9.79	8.05	4.02	2.52	-78.8	-37.3
gas oil	% of total fuel consumption	0.484	0.682	0.882	0.515	0.387	-20.0	-24.9
natural gas	% of total fuel consumption	41.6	40.2	32.1	33.9	29.2	-29.8	-13.9
coal	% of total fuel consumption	46.0	49.3	59.0	61.6	67.9	47.6	10.2
HS fuel oil	% of total fuel oil consumption	2.16	0	0	0	0	-100	0
MS fuel oil	% of total fuel oil consumption	9.75	21.6	26.7	22.9	25.7	163	12.2
LS fuel oil	% of total fuel oil consumption	25.4	17.8	18.8	20.4	7.76	-69.4	-62.0
VLS fuel oil	% of total fuel oil consumption	62.7	60.6	54.5	56.8	66.6	6.20	17.3
natural gas, technologically captive use	% of total natural gas consumption	68.6	79.2	82.4	86.4	91.2	32.9	5.60
of which in combined-cycle units	*% of total natural gas consumption*	*62.2*	*74.8*	*79.5*	*84.5*	*89.9*	*44.5*	*6.40*
natural gas, non-technologically captive use	% of total natural gas consumption	31.4	20.8	17.6	13.6	8.82	-71.9	-35.1
Geothermal fluid for electricity generation	% of total geothermal fluid extracted	99.5	97.3	97.6	97.9	97.5	-2.00	-0.400
Electricity generation from renewables								
thermal from biomass & biodegradable fraction of waste	% of total generation	0.090	0.141	0.248	0.328	0.444	393	35.4
geothermal	% of total generation	5.56	5.39	5.98	6.20	6.76	21.6	9.00
hydro from natural flows	% of total generation	16.6	21.5	28.4	30.5	26.1	57.2	-14.4
wind and solar (photovoltaic)	% of total generation	0.497	0.486	0.604	0.897	1.07	115.3	19.3
Total	% of total generation	22.8	27.6	35.2	38.0	34.4	50.9	-9.50
EN6 Sales								
Residential segment								
Green power sold	% of power sold	0	55.0	74.0	81.9	75.8	0	-7.40
Time-of-use power sold	% of power sold	16.0	21.8	20.7	12.2	8.34	-47.9	-31.6
Business segment								
Green power sold	% of power sold	5.35	11.7	15.3	24.9	17.5	227	-29.7
Time-of-use power sold	% of power sold	31.8	64.0	65.0	72.7	79.0	148	8.70
Large customers' segment								
Green power sold	% of power sold	0.002	0.887	10.1	1.64	1.57	78,400	-4.30
Time-of-use power sold	% of power sold	89.2	89.0	82.9	96.3	93.3	4.60	-3.10
Household customers' segment								
Time-of-use power sold	% of power sold	5.21	1.12	1.22	37.1	94.1	1,706	153
Non-household customers' segment								
Time-of-use power sold	% of power sold	0.070	0.005	68.5	87.8	92.2	131,614	5.00
Overall power sold								
high-voltage	% of power sold	13.0	11.9	10.9	5.27	4.78	-63.2	-9.30
medium-voltage	% of power sold	15.6	14.2	13.5	12.4	10.3	-34.0	-16.9
low-voltage	% of power sold	71.5	73.9	75.6	82.4	84.9	18.7	3.00
Total green power sold	% of power sold	0.749	3.08	5.75	9.11	8.87	1,084	-2.60
Total time-of-use power sold	% of power sold	11.8	17.9	29.9	49.5	78.7	566	59.0

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation, simple)	g/kWh thermal net	0.671	0.537	0.525	0.394	0.341	-49.2	-13.5
EN20 NO_X (thermal generation, simple)	g/kWh thermal net	0.523	0.494	0.498	0.41	0.389	-25.6	-5.10
EN20 Particulates (thermal generation, simple)	g/kWh thermal net	0.024	0.024	0.024	0.02	0.014	-41.7	-30.0
EN16 CO_2 (thermal generation, simple)	g/kWh thermal net	694	691	746	729	736	6.10	1.00
EN20 SO_2 (total from thermal generation, simple)	g/kWh total net	0.480	0.359	0.312	0.228	0.218	-54.6	-4.40
EN20 NO_X (total from thermal generation, simple)	g/kWh total net	0.374	0.331	0.296	0.237	0.248	-33.7	4.60
EN20 Particulates (total from thermal generation, simple)	g/kWh total net	0.017	0.016	0.014	0.012	0.009	-47.1	-25.0
EN16 CO_2 (total from thermal generation, simple)	g/kWh total net	496	462	443	422	470	-5.20	11.4
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	1.02	1.02	1.07	1.16	1.27	24.5	9.50
CH_4+CO_2, expressed as CO_2 equivalent (gas distribution)	g/m^3 natural gas distributed	111	111	0	0	0	-100	0
EN20 H_2S (geothermal fluid)	g/kWh geothermal net	3.09	2.53	2.04	2.06	1.73	-44.0	-16.0
EN20 CO_2 (geothermal fluid)	g/kWh geothermal net	372	367	375	364	340	-8.60	-6.60
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	0.149	0.079	0	-47.0
Total nitrogen (expressed as N)	mg/kWh thermal net	0.523	0.494	0.498	0.410	0.389	-25.6	-5.10
Total phosphorus (expressed as P)	mg/kWh thermal net	0	0	0	0.146	0.056	0	-61.6
COD	mg/kWh thermal net	0	0	0	7.69	6.33	0	-17.7
BOD	mg/kWh thermal net	0	0	0	2.17	2.00	0	-7.80
EN22 **Specific waste production**								
Coal and brown-coal ash (thermal generation)	g/kWh net from coal and brown coal	48.0	52.5	49.0	47.4	45.0	-6.30	-5.10
Oil flyash (thermal generation)	g/kWh net from fuel oil & gas oil	0.258	0.165	0.108	0.259	0.104	-59.7	-59.8
Oil bottom ash (thermal generation)	g/kWh net from fuel oil & gas oil	0.261	0.165	0.108	0.259	0.104	-60.2	-59.8

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 Waste recovery								
Coal and brown-coal ash	% production	84.0	87.5	83.6	84.5	62.7	-25.4	-25.8
bottom ash	*% production*	*103*	*97.7*	*91.1*	*94.7*	*100*	*-2.90*	*5.60*
flyash	*% production*	*83.6*	*87.4*	*83.4*	*84.2*	*61.1*	*-26.9*	*-27.4*
Gypsum from desulfurization	% production	99.4	93.0	101	96.0	99.2	-0.200	3.30
Other non-hazardous special waste								
electricity generation & geothermal drilling	% production	64.4	62.4	34.5	41.1	29.8	-53.7	-27.5
electricity distribution	% production	98.3	96.4	93.3	88.6	79.3	-19.3	-10.5
fuel storage & handling, gas distribution	% production	98.1	93.5	95.9	100	100	1.09	0
Total	**% production**	**70.0**	**67.9**	**39.4**	**45.4**	**36.1**	**-48.4**	**-20.5**
Total non-hazardous special waste								
electricity generation & geothermal drilling	% production	84.5	86.7	81.7	82.7	67.6	-20.0	-18.3
electricity distribution	% production	98.3	96.4	93.3	88.6	79.3	-19.3	-10.5
fuel storage & handling, gas distribution	% production	98.1	93.5	95.9	100	100	1.90	0
Total	**% production**	**84.8**	**86.8**	**81.8**	**82.7**	**67.8**	**-20.0**	**-18.0**
Oil flyash	% production	6.54	0	0	0	0	-100	0
Other hazardous special waste								
electricity generation & geothermal drilling	% production	13.3	14.8	5.07	3.54	50.2	277.4	1,318
electricity distribution	% production	53.7	62.8	76.6	70.0	59.4	10.6	-15.1
fuel storage & handling, gas distribution	% production	0.311	1.25	0	3.28	12.8	4,015	290
Total	**% production**	**38.3**	**44.2**	**25.5**	**22.2**	**54.2**	**41.5**	**144**
Total hazardous special waste								
electricity generation & geothermal drilling	% production	12.5	13.8	5.02	3.51	50.0	300	1,324
electricity distribution	% production	53.7	62.8	76.6	70.0	59.4	10.6	-15.1
fuel storage & handling, gas distribution	% production	0.311	1.25	0	3.28	12.8	4,015	290
Total	**% production**	**36.8**	**43.0**	**25.4**	**22.0**	**54.0**	**46.7**	**145**
Total special waste								
electricity generation & geothermal drilling	% production	83.9	86.2	80.2	80.9	67.4	-19.7	-16.7
electricity distribution	% production	79.4	81.1	85.2	79.2	70.5	-11.2	-11.0
fuel storage & handling, gas distribution	% production	26.6	42.3	85.6	86.4	96.4	262	11.6
Total	**% production**	**83.7**	**86.1**	**80.3**	**80.9**	**67.5**	**-19.4**	**-16.6**
Mining & extracting activities								
Yield of the site (open-pit mine)	million m^3 of moved soil/million t of extracted mineral	0	0.022	0	0.017	0.031	0	82.4

Enel operates in Italy through Enel Produzione (thermal and renewable power generation), Enel Green Power (renewable power generation), Enel Distribuzione (electricity distribution) and the Sales Division (sale of electricity and gas).

In 2011, the following legislation entered into force:

> Decree of the Environment Ministry no. 52 of February 18, 2011 (Consolidated Text concerning the waste traceability control system – SISTRI), subsequently amended by Ministerial Decree 219/2011; Law Decree 216/2011 (the so-called "One Thousand Date Postponements") postponed the date of full operation of SISTRI to April 2, 2012; SISTRI will replace the current paper-based system for reporting data on the management of waste, from production to treatment;

> Legislative Decree 121 of July 7, 2011, implementing EU Directives on the protection of the environment through criminal law (Directive 2008/99/EC) and on ship-source pollution and on the introduction of penalties for infringements (Directive 2005/35/EC). The decree introduced two new crimes into the Criminal Code: "Killing, destruction, possession or taking of specimens of protected wild fauna or flora species" and "Destruction or deterioration of habitats within protected sites". The decree amended Legislative Decree 231/2001, by extending the "administrative liability" of organizations, companies and associations to a number of environmental crimes, some of which are included in the Environmental Code (Legislative Decree 152/2006).

Highlights of 2011

In 2011, electricity generation continued to fall (-~2.7 TWh) owing to the contraction of demand due to the economic crisis. The decrease in electricity generation from renewables, due to lower hydro generation from natural flows (-~4.3 TWh) and from pumped storage (-~1.8 TWh), was in part offset by the increase in thermal generation from coal (+~4.7 TWh).

EN1 It is worth noting the generalized increase in the consumption of the most part of expendables, especially limestone for flue-gas desulfurization, ammonia for denitrification, and of a large part of those typical of thermal generation.

EN1 EN3 The consumption of fossil fuels and biomass in thermal generation grew by ~5.3% and ~30%, respectively; in particular, biomass passed in a single year from ~77,000 to ~100,000 toe.

Contributors to this growth were:

> refuse-derived fuel (RDF), co-fired with coal;

> solid biomass, used as main fuel or co-fired with coal;

> biodiesel, used in some gas-turbine units in small islands.

In the fossil fuel mix, the percentages of fuels used in the more efficient plants (natural gas in combined-cycle units and coal in the new Torrevaldaliga Nord plant) went up, whereas those of gas oil and fuel oil went down. In particular, the contribution of VLS was up by about 10 percentage points, to the expense of LS fuel oil (-~13 percentage points). The contribution of MS fuel oil was up by about 3 percentage points.

EN5 EN6 EN18 Enel Green Power Italia put into service over 50 MW of photovoltaic plants:

> Barrafranca (province of Enna);

> Serre Persano (province of Salerno), entirely rebuilt and doubled;

> Canaro (province of Rovigo);

> Adrano (province of Catania);

> San Gillio (province of Turin);

> Sesto Campano (region of Molise), located in the upper reservoir of the Presenzano pumped-storage hydro plant;

> Strambino, resulting from an agreement with Finpiemonte Partecipazioni;

> Deruta (province of Perugia).

Enel Green Power also made a deal with Agatos Energia to acquire an 80% stake in Agatos Green Power San Gillio Srl, the owner of a 4.8 MW photovoltaic generation project already authorized in the municipality of San Gillio (province of Turin). Enel Green Power also got a green light from the Sardinia Region to build the wind farm of Portoscuso, in the Sulcis iglesiente area.

Enel Produzione reduced its holdings in the company HDE (headquartered in Trento) from 100% to 49% and in the two plants of San Floriano Egna and Stramentizzo (acquired by San Floriano Energy, headquartered in Bolzano) from 100% to 33%. As a consequence, the net maximum capacity of its hydro plants was down by about 800 MW.

EN6 EN7 EN18 Since 2010, the Sales Division has launched an all-inclusive green power offering, i.e. electricity generated by hydro power plants, with neutralization of CO_2 emissions from the invoicing process (consumption of paper and materials) and from the consumption of electricity by hydro power plant auxiliaries. The statement of CO_2 emissions was issued by Det Norske Veritas (DNV). The emissions will be offset by purchasing and subsequently canceling Verified Emission Reductions (VERs) and Certified Emission Reductions (CERs).
The Italian commercial activity is also centered on time-of-use rate plans, which shift electricity demand to night time, thus increasing the overall efficiency of the electricity sector and decreasing wastage and negative environmental impacts.
With respect to 2010, the amount of green power sold was down by about 1 TWh, while the amount of power sold remained practically unchanged.

EN8 EN10 In 2011, thanks to careful water management and to the improvement plan described in detail under indicator EN26, specific requirements of water, excluding the contribution of as-is sea water, improved (-~7%). In absolute terms, the recovered waste waters amounted to about 5 million m^3. This figure excludes the make-up water for the closed-cycle cooling system of the Fusina thermal plant (Venice), which comes entirely from the waste water treatment system of the local municipally-owned company (about 837,800 m^3 in 2011).

The following are the results achieved in terms of specific emissions of major pollutants into the atmosphere:

EN16 Net specific CO_2 emissions, referred to total electricity generation, mounted to 470 g/kWh (+11%), owing to higher thermal generation from coal and lower generation from hydro.

EN20 Net specific emissions of macro-pollutants, referred to thermal generation alone, dropped significantly – SO_2 by ~13%, NO_X by ~12% and particulates by ~30% – on 2010, testifying the considerable technological efforts undertaken for their abatement (see EN26).
Specific emissions of H_2S from geothermal generation were down by 16% on 2010 thanks to the entry into operation of some "AMIS" abatement systems at the end of 2010.

EN18 In 2011, the emissions of CO_2 displaced by carbon-free generation amounted to roughly 20 million tonnes (about 1% less than in the previous year).

EN22 In 2011, the Infrastructure and Networks Division went on with its special project (started in 2005) of decontamination/disposal of equipment containing oil with PCBs (not below 50 ppm). Decontamination/disposal of equipment containing oil with a PCB content exceeding 500 ppm was completed as early as in 2007, ahead of the legislative time limit (2009). From the start of the project to the end of 2011, the contaminated equipment (power transformers, measuring transformers, capacitors, bushing insulators, circuit-breakers, etc.) covered by the plan diminished by about 30,000 units (about 2,000 units in 2011).

The percentage of waste delivered to recovery operators was over 67% in 2011; the contraction vs. 2010 (-14 percentage points) was due to higher production of coal ash (+10%) and lower ash demand by the construction industry. In spite of the sharp increase in its production, gypsum was easily sold for reuse.

EN19 Ozone-depleting substances:

R22

Emission of **507 kg (equivalent to 27.8 kg of CFC11)**, determined from gas replenishments in air conditioning systems.
Location: this gas (withdrawn from the market in 2010) is used in the air conditioning/heating systems of about 900 office buildings, which are occupied by by Enel's personnel and managed by Enel Servizi. Investigations are being conducted on a replacement gas to be progressively introduced. The replacement is scheduled in 2014.

EN23 Spills:

Italy	*Description of the spill*	*Impact and mitigation*
Bologna Business Unit (province of Lucca) Amount: **0.082 m^3**	Oil spilled into the water of the Castelnuovo di Garfagnana dam (municipality of Castelnuovo di Garfagnana). The spill was reported in the Group's Consolidated Financial Statements.	Emergency response measures confined the spill to a marginal and well-bounded area of the Turrite Cava impoundment. Reliance was made on a specialist firm, which immediately removed the spilt oil.
Sicilia Business Unit, Paternò plant (municipality of Paternò, province of Catania) Amount: **0.4 m^3**	Spill of hydraulic oil from the piping of unit 2.	
Sicilia Business Unit, Contrasto plant (municipality of Adrano, province of Catania) Amount: **0.02 m^3**	Explosion of a capacitive voltage transformer in a high-voltage substation.	
Sicilia Business Unit, Bracallà (municipality of Cesarò, province of Messina) Amount: **0.02 m^3**	Spill of hydraulic oil owing to a theft; clean-up by a Category 9 specialist firm. The two spills of Cesarò and Paternò were reported in the Group's Consolidated Financial Statements.	
Sulcis Business Unit, Portoscuso plant Amount: **168 m^3**	Spill of dense fuel oil from service tank TK 5.	The spill extended in part to the nearby ALCOA aluminum factory. Emergency response measures included: remediation of the area surrounding the service tank, with partial recovery of non-dirty dense fuel oil, and clean-up of the areas affected by the spill (basin containing the tank and nearby underground passages + pump room of the Portoscuso plant, ducts of the adjoining ALCOA factory).
Enel Distribuzione Amount: **89 m^3**	985 spills of dielectric oil. For all the required safety and remediation measures, use was made of a simplified procedure applicable to surface areas of less than 1,000 m^2 – Legislative Decree 152/06, title IV. It is worth noting that these incidents are concentrated in sites where thefts of in-service equipment (to extract valuable materials, e.g. copper) are frequent.	Generally, given the low amounts of spilt oil, the contaminated areas are decontaminated within 30 days from the incident (without requiring a formal rehabilitation procedure).

EN26 Environmental enhancements.

Water

- Enel Produzione decreased its water consumption by: i) increasing its reuse of waste waters, thanks to better maintenance of its water treatment and recycling systems; ii) reusing waste waters as make-up waters in cooling towers; iii) continuing its program of construction of crystallization systems for waste waters from desulfurizer drains in coal-fired plants; and iv) installing systems to treat waste waters by osmosis.

Emissions

- Enel Produzione improved emission abatement systems in its thermal power plants by using very low-sulfur fuel oil for SO_2 reduction (Augusta) and installing new, low-NO_X burners (Priolo Gargallo). Additionally, to hold down emissions of particulates, the company: i) put in place a procedure for monitoring and controlling fugitive methane emissions (Porto Empedocle); ii) partially roofed the coal bunker area and installed a pneumatic system for carrying flyash from the abatement system to the storage silos (Sulcis); and iii) initiated the construction of coal storage domes and improved coal landing infrastructures (Brindisi Sud).
- Enel Green Power and Lampo Greengas (engaged in carbon dioxide distribution and sale) signed an agreement under which CO_2 from the geothermal plant of Valle Secolo (Larderello, municipality of Pomarance, Tuscany) will be sold to Lampo Greengas. The company will recover, store and distribute CO_2 for many applications (foods & beverages, greenhousing, freezing and inertization).
- Enel Servizi embarked on a project (Sam Carbon Enel) to reduce CO_2 emissions associated with traveling; the emission reductions achieved will be quantified from 2012 on.

Materials and resources

- Enel Green Power, Enel Produzione: progressive replacement of polluting and toxic products with alternative, biodegradable and atoxic ones (hydrazine with carbohydrazide, biodegradable oil and grease in place of mineral oil). Optimized dosage of hypochlorite in water treatment (Genova plant).
- Enel Produzione: reuse of sludges (in place of ferric chloride) in the liquid release treatment system and in the secondary neutralizer and of brine from vaporizers for pH balancing (Priolo Gargallo plant).

Landscape

- Enel Produzione: environmental regeneration of the areas adjoining the plants; demolition of no longer used structures (Santa Barbara and Pietrafitta plants).

Waste

- Enel Produzione and Enel Green Power – geothermal energy: the companies continued to remove asbestos-containing materials, where present, and to look for new opportunities for recovering waste and packaging materials from all of their activities. They replaced and disposed of PCB-contaminated transformers and equipment, whose oil was decontaminated and recycled.
- Enel Servizi: reduction of hazardous waste (used oil) thanks to the use of electric vehicles and of used toner cartridges thanks to document digitization.

Renewables

- Enel Produzione: at the site of the thermal plant of Sulcis, enlargement of the biomass storage deposit; this measure was justified by the need for having a higher amount of stored material to cover increases in generation.
- Design of new systems for recovering energy from the minimum in-stream flow released from large plants.

Noise

- Enel Produzione: preliminary studies, noise measuring surveys and mitigation of noise emissions in various sites.

Liquid releases

- Enel Green Power: in some hydro plants, the company installed an emergency system for containment of oil spills from turbines, hydraulic systems, etc. (Castelnuovo Garfagnana, Malegno and Ceto plants, Pian Sisi intake structure, Quarto dam) and oil detectors in turbine pits (Sestaione plant).

Soil

- Enel Produzione: in some plants, improvement of hazardous-substance storage basins; elimination and remediation of dense fuel oil tanks; replacement of underground single-chamber tanks with double-chamber ones equipped with leakage detectors.

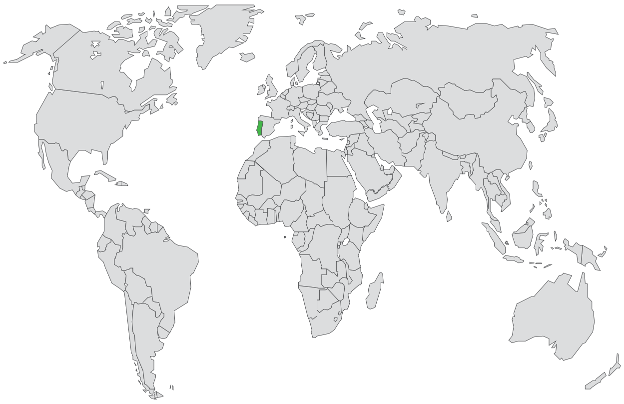
Other

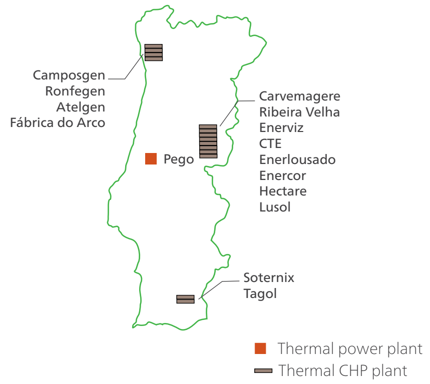
- Enel Servizi: preference of hotels which are ISO 14001-certified (so far, the list contains 50 hotels) and have electric-car recharging points.

Portugal

Thermal generation, simple and CHP

Endesa SA
Enel Green Power SpA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
15	714	1,880

Power installations

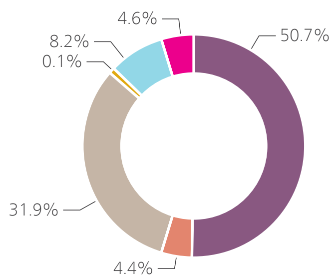
	Power plants no.	Units no.	Net maximum electrical capacity MW	Useful thermal capacity 10^6 kcal/h
Steam (condensing)	1	2	225	-
Gas turbines for CHP	0	1	420	-
Alternative engines for CHP	14	7	69	78.60
	15	**10**	**714**	**79**

The Pego power plant has an ISO 14001-certified environmental management system.

Net electricity generation
Total: 1,880 million kWh

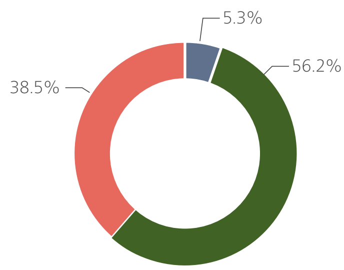
Useful heat output (combined with power generation)
Total: 289,551 million kcal (equal to 337 million kWh)

Net maximum electrical capacity
Total: 13,393 MW



- Steam (condensing)
- Steam (condensing) repowered with gas turbines
- Combined-cycle gas turbines
- Single-cycle gas turbines for CHP
- Single-cycle gas turbines
- Alternative engines

Fuel consumption
Total: 550,370 t of oil-equivalent



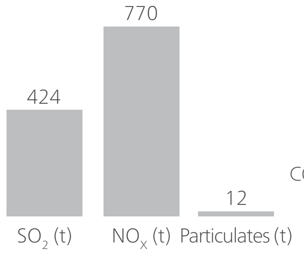
- Fuel oil
- Natural gas
- Coal

Waste waters

Discharged: **216,096 m^3**

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

Emissions into the atmosphere

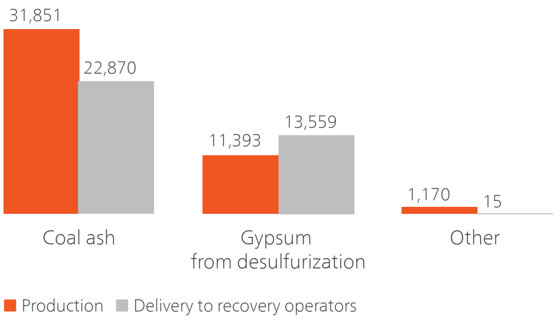


CO_2 (t)	1,664,982
from combustion	*1,662,119*
from desulfurization	*2,861*

Special waste

Total production: **44,430 t**
Total delivery to recovery operators: **36,451 t**

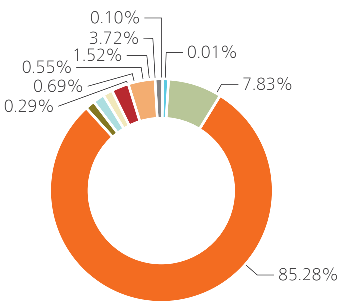
Non-hazardous
Production: 44,414 t
Delivery to recovery operators: 36,444 t



Hazardous
Production: 15 t
Delivery to recovery operators: 7 t

Expendables

Total: 7,625 t



- Resins, hydrazine, carbohydrazide & hydrogen peroxide
- Ammonia
- Limestone for flue-gas desulfurization
- Sodium hypochlorite, chlorine dioxide, ferrous sulphate, ferrous chloride and trisodium phosphate
- Sulfuric & hydrochloric acids
- Caustic soda
- Lime, ferric chloride and polyelectrolyte
- Lubricating oil
- Dielectric oil

Water for industrial uses

Total requirements: 4,215.05 m^3
Total abstraction from inland waters: 4,215.05 m^3

Portugal

Wind power generation — Enel Green Power SpA

The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
11	116	247

Power installations

	Power plants no.	Net maximum electrical capacity MW
WIND	**11**	**116**

All the power plants have an ISO-certified environmental management system in place.

Net electricity generation

Total: 247 million kWh

Avoided CO_2 emissions

Due to wind generation: **211,464 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

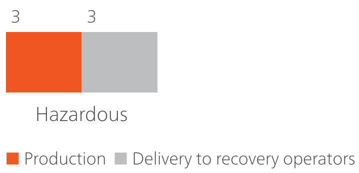
Equivalent yearly hours of utilization*

Wind: **2,122 hours**

* Yearly generation/capacity ratio. For Endesa, generation is considered to refer to the entire year.

Special waste

Total production: **2.71 t**
Total delivery to recovery operators: **2.71 t**



Other data

Wind generation

Wind systems

Surface area occupied by platforms, service roads, buildings: **15 ha**

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	19	17	11	11	12
thermal	no.	1	1	1	1	1
wind	no.	18	16	10	10	11
Net maximum electrical capacity	MW	258	258	295	299	760
thermal	MW	148	148	221	224	644
wind	MW	110	110	74.5	74.5	116
Combined heat & power installations						
Power plants (thermal)	no.	-	4	5	5	14
Net maximum electrical capacity (thermal)	MW	-	22.0	25.7	44.4	69.9
Useful thermal capacity (thermal)	million kcal/h	-	18.7	27.9	27.9	78.6

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
fuel oil (LS)	thousand t	0.276	1.80	4.41	3.04	2.39
	thousand toe	0.265	1.74	4.25	3.10	2.44
gas oil	thousand t	0	0.002	0.002	0.002	0.008
	thousand toe	0	0.002	0.002	0.002	0.003
natural gas	million m^3	0	0	0	0	272
	thousand toe	0	0	0	0	251
technologically captive use	*million m^3*	*0*	*0*	*0*	*0*	*272*
	thousand toe	*0*	*0*	*0*	*0*	*251*
of which in combined-cycle units	million m^3	0	0	0	0	272
	thousand toe	0	0	0	0	251
coal	thousand t	87.6	355	461	265	356
	thousand toe	55.9	209	274	157	211
Total	**thousand toe**	**56.2**	**210**	**278**	**161**	**464**
	TJ	**2,352**	**8,810**	**11,637**	**6,720**	**19,447**
Thermal generation combined with heat generation						
fuel oil (LS)	thousand t	0	5.76	4.99	4.49	27.4
	thousand toe	0	5.67	4.91	4.42	27.0
gas oil	thousand t	0	0.030	0.003	0.150	0.137
	thousand toe	0	0.033	0.004	0.136	0.069
natural gas	million m^3	0	26.3	31.9	29.7	65.1
	thousand toe	0	23.8	29.2	26.8	58.8
technologically captive use	*million m^3*	*0*	*16.2*	*14.6*	*16.7*	*39.2*
	thousand toe	*0*	*14.7*	*13.6*	*15.0*	*35.5*
non-technologically captive use	*million m^3*	*0*	*10.1*	*17.3*	*13.0*	*25.9*
	thousand toe	*0*	*9.11*	*15.7*	*11.8*	*23.4*
Total	**thousand toe**	**0**	**29.5**	**34.2**	**31.3**	**85.9**
	TJ	**0**	**1,233**	**1,430**	**1,311**	**3,596**
Grand total	**thousand toe**	**56.2**	**240**	**312**	**192**	**550**
	TJ	**2,352**	**10,043**	**13,067**	**8,031**	**23,043**

		2007	2008	2009	2010	2011
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	0.594	2.73	4.73	3.64	4.21
From wells	million m^3	0	0.001	0.001	0.001	0.001
Total abstraction from inland waters	**million m^3**	**0.594**	**2.73**	**4.73**	**3.64**	**4.22**
for thermal generation	million m^3	0.594	2.73	4.73	3.64	4.22
EN1 Expendables						
Resins	t	0	0	0	0	7.31
Hydrazine	t	0	1.30	1.10	0.854	0.373
Carbohydrazide	t	0	0	0	0	0.100
Ammonia	t	0	894	958	466	597
Limestone for flue-gas desulfurization	t	0	3,335	8,740	4,831	6,503
Sodium hypochlorite	t	0	121	26.2	13.7	22.4
Trisodium phosphate	t	0	0.024	0.075	0.227	0
Lime	t	0	0.536	87.4	1.65	110
Ferric chloride	t	0	1.30	2.28	2.57	3.70
Polyelectrolyte	t	0	14.7	22.8	0.778	1.56
Sulfuric & hydrochloric acids	t	0	150	113	47.5	52.5
Caustic soda	t	0	193	152	38.9	42.0
Lubricating oil	t	0	51.2	51.1	21.1	284
Dielectric oil	t	0	0.050	0.286	0.743	0.503
Other	t	0	0	0	0	0.642
Total	**t**	**0**	**4,762**	**10,154**	**5,424**	**7,626**
for thermal generation	t	0	4,695	10,116	5,412	7,346
for thermal generation combined with heat generation	t	0	66.3	36.8	12.4	279
for wind generation	t	0	0	0.576	0.043	0.668

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels	**million kWh**	**231**	**998**	**1,300**	**815**	**1,880**
simple	million kWh	231	915	1,195	658	1,668
natural gas	*million kWh*	*0*	*0*	*0*	*0*	*785*
of which in combined-cycle units	million kWh	0	0	0	0	785
coal	*million kWh*	*231*	*915*	*1,195*	*658*	*883*
combined with heat generation	million kWh	0	83.6	105	156	212
fuel oil & gas oil	*million kWh*	*0*	*18.3*	*31.1*	*35.8*	*70.1*
natural gas	*million kWh*	*0*	*65.3*	*73.7*	*121*	*142*
From renewables (wind)	**million kWh**	**44.4**	**202**	**188**	**153**	**247**
Total	**million kWh**	**275**	**1,200**	**1,488**	**968**	**2,127**
simple	million kWh	275	1,117	1,383	811	1,915
combined with heat generation	million kWh	0	83.6	105	156	212
Useful heat output (combined with power generation)						
From fossil fuels	million kcal	0	128,746	111,781	74,047	289,551
	million kWh	0	150	130	86.1	337

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	1.11	2.35	0.511	0.262	0.424
EN20 NO_X	thermal generation	thousand t	0.680	1.60	0.843	0.466	0.770
EN20 Particulates	thermal generation	thousand t	0.040	0.096	0.035	0.012	0.012
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	208	838	1,068	628	1,425
	fossil-fired thermal generation (from desulfurization)	thousand t	0	1.47	9.63	2.12	2.86
	total from fossil-fired thermal generation	thousand t	208	839	1,077	630	1,428
	fossil-fired thermal generation (CHP) (from combustion)	thousand t	0	70.0	81.6	76.6	237
	Total	**thousand t**	**208**	**909**	**1,159**	**706**	**1,665**
EN16 SF_6	electricity generation	kg	0	0.003	0	0	0
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**208**	**909**	**1,159**	**706**	**1,665**
EN18 **Avoided CO_2 emissions**							
Due to wind generation		thousand t	40.1	185	170	147	211
EN21 **Waste waters (discharged quantity)**	thermal generation	million m^3	0	0.973	3.57	0.276	0.216
	thermal generation (CHP)	million m^3	0	0.113	0	0	0
	Total electricity generation	**million m^3**	**0**	**1.09**	**3.57**	**0.276**	**0.216**
EN21 **Conventional polluting load in waste waters discharged by installations**							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	0	0	0	54.1	1.01
	in some plants with an overall capacity of	MW	0	0	0	224	224
Total nitrogen (expressed as N)	thermal generation	kg	0	0	0	1,242	1,197
	in some plants with an overall capacity of	MW	0	0	0	224	224
Total phosphorus (expressed as P)	thermal generation	kg	0	0	0	226	333
	in some plants with an overall capacity of	MW	0	0	0	224	224
COD	thermal generation	kg	0	0	0	18,478	8,562
	in some plants with an overall capacity of	MW	0	0	0	224	224
BOD	thermal generation	kg	0	0	0	5,941	960
	in some plants with an overall capacity of	MW	0	0	0	224	224
EN22 **Non-hazardous special waste**							
Coal bottom ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	2,745	3,834	2,167	2,691
delivery to recovery operators		t	0	56.1	70.8	11,197	2,300
Coal flyash	fossil-fired thermal generation (simple and CHP)						
production		t	810	3,225	61,123	25,034	29,160
delivery to recovery operators		t	22.7	289	44,777	22,814	20,570
Gypsum from desulfurization	fossil-fired thermal generation (simple and CHP)						
production		t	0	3,964	16,395	10,515	11,393
delivery to recovery operators		t	0	1,224	14,436	5,262	13,559
Other	electricity generation						
production		t	721	26.5	149	920	1,173
delivery to recovery operators			129	25.7	3.03	91.4	18.4
Total	electricity generation						
production		t	1,531	9,960	81,501	38,636	44,418
delivery to recovery operators		t	152	1,595	59,287	39,365	36,447

	Source		2007	2008	2009	2010	2011
EN22 Hazardous special waste							
Oil flyash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	0	0	1.51
delivery to recovery operators		t	0	0	0	0	0.180
Other ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	7.98	8.60	0
delivery to recovery operators		t	0	0	0	8.60	0
Other	electricity generation						
production		t	15.6	238	11.2	176	723
of which with PCBs		*t*	*8.15*	*35.1*	*7.96*	*10.2*	*17.6*
delivery to recovery operators		t	0	205	18.6	183	716
of which with PCBs		*t*	*0*	*6.60*	*16.3*	*16.5*	*17.6*
Total	electricity generation						
production		t	15.6	238	19.2	185	725
delivery to recovery operators		t	0	205	18.6	191	717
EN22 Total special waste	electricity generation						
production		t	1,547	10,199	81,520	38,821	45,142
delivery to recovery operators		t	152	1,800	59,305	39,556	37,164

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	2,437	2,300	2,325	2,439	2,785	14.3	14.2
EN1 EN3 Net heat rate of thermal generation (CHP)	kcal/kWh	0	1,263	1,454	1,291	1,566	0	21.3
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	2.58	2.99	3.96	5.54	2.53	-1.90	-54.3
excluding contribution of as-is sea water	liters/kWh	2.58	2.99	3.96	5.54	2.53	-1.90	-54.3
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	100	100	100	100	100	0	0
from wells	% of requirements	0	0.037	0.021	0.027	0.024	0	-11.1
Total from inland waters	**% of requirements**	**100**	**100**	**100**	**100**	**100**	**0**	**0**
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	0.472	3.09	2.93	3.92	5.34	1,031	36.2
gas oil	% of total fuel consumption	0	0.015	0.002	0.072	0.013	0	-81.9
natural gas	% of total fuel consumption	0	9.91	9.37	14.0	56.2	0	301
coal	% of total fuel consumption	99.5	87.0	87.7	82.1	38.4	-61.4	-53.2
LS fuel oil	% of total fuel oil consumption	100	100	100	100	100	0	0
natural gas, technologically captive use	% of total natural gas consumption	0	61.7	46.4	55.9	92.4	0	65.3
of which in combined-cycle units	*% of total natural gas consumption*	*0*	*0*	*0*	*0*	*81.0*	*0*	*0*
natural gas, non-technologically captive use	% of total natural gas consumption	0	38.3	53.6	44.1	7.55	0	-82.9

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
wind	% of total generation	16.2	16.8	12.6	15.8	11.6	-28.4	-26.6
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	4.79	2.57	0.428	0.398	0.254	-94.7	-36.2
EN20 NO_X (thermal generation)	g/kWh thermal net	2.95	1.75	0.705	0.708	0.462	-84.3	-34.7
EN20 Particulates (thermal generation)	g/kWh thermal net	0.174	0.105	0.029	0.018	0.007	-96.0	-61.1
EN16 CO_2 (thermal generation)	g/kWh thermal net	903	917	901	957	856	-5.20	-10.6
EN16 CO_2 (thermal generation - CHP)	g/kWh thermal net	0	300	347	316	432	0	36.7
EN20 SO_2 (total from thermal generation - simple and CHP)	g/kWh total net	4.02	1.74	0.316	0.249	0.172	-95.7	-30.9
EN20 NO_X (total from thermal generation - simple and CHP)	g/kWh total net	2.47	1.19	0.521	0.442	0.313	-87.3	-29.2
EN20 Particulates (total from thermal generation - simple and CHP)	g/kWh total net	0.145	0.071	0.022	0.011	0.005	-96.6	-54.5
EN16 CO_2 (total from thermal generation - simple and CHP)	g/kWh total net	757	673	716	670	676	-10.7	0.900
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0	0.230	0	0	0	0	0
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	0.082	0.001	0	-98.8
Total nitrogen (expressed as N)	mg/kWh thermal net	0	0	0	1.89	1.36	0	-28.0
Total phosphorus (expressed as P)	mg/kWh thermal net	0	0	0	0.344	0.377	0	9.60
COD	mg/kWh thermal net	0	0	0	28.1	9.70	0	-65.5
BOD	mg/kWh thermal net	0	0	0	9.03	1.09	0	-87.9
EN22 **Specific waste production**								
Coal ash (thermal generation)	g/kWh net from coal and brown coal	3.51	6.53	54.3	41.3	36.1	928	-12.6
EN22 **Waste recovery**								
Coal ash	% production	2.81	5.78	69.0	125	71.8	2,455	-42.6
bottom ash	*% production*	*0*	*2.04*	*1.85*	*517*	*85.4*	*0*	*-83.5*
flyash	*% production*	*2.81*	*8.95*	*73.3*	*91.1*	*70.5*	*2,408*	*-22.6*
Gypsum from desulfurization	% production	0	30.9	88.1	50.0	119	0	138
Other non-hazardous special waste electricity generation	% production	17.9	97.2	2.03	9.94	1.57	-91.2	-84.2
Total non-hazardous special waste electricity generation	% production	9.91	16.0	72.7	102	82.1	728	-19.5
Oil flyash	% production	0	0	0	0	11.9	0	0
Other hazardous special waste electricity generation	% production	0	85.9	96.7	103	99.0	0	-3.90
Total special waste electricity generation	% production	9.81	17.6	72.7	102	82.3	738	-19.3

Highlights of 2011

EN1 EN3 In the 2011 fossil fuel mix, the shares of natural gas used in combined-cycle units and of low-sulfur fuel oil were up by ~53 and ~1 percentage points, respectively, to the expense of coal.

EN5 EN6 EN18 The overall net maximum capacity was up by about 490 MW (of which, about 450 MW in thermal plants and a little less than 40 MW in wind farms). Enel Green Power commissioned another 4 MW in its wind farm of Alvaiázere. Moreover, through its Finerge subsidiary, it acquired an additional stake of 50% in Sociedade Térmica Portuguesa (engaged in renewables and high-efficiency combined heat & power generation), thus becoming its sole shareholder.
Most of the additional thermal capacity with respect to 2010 is due to the 100% consolidation of the Pego thermal plant (previously consolidated at 50%).

EN8 EN10 Specific water requirements were down by over 50% on 2010, thanks to careful water management (see EN26).

The following are the results achieved in terms of specific emissions of major pollutants into the atmosphere:

EN16 Net specific emissions of CO_2 referred to total electricity generation climbed from 670 to 740 g/kWh, owing to the higher weight of thermal generation in the generating mix (100% consolidation of the Pego thermal plant in 2011 vs. 50% in 2010).

EN20 Net specific emissions of macro-pollutants (SO_2, NO_X and particulates) sharply decreased on 2010, thanks to the higher weight of natural gas in the fuel mix (see EN1 EN3):
> in simple thermal generation, the reduction was equal to 36%, 35% and 61%, respectively;
> in CHP thermal generation, the reduction was equal to 24%, 23% and 50%, respectively.

Enel operates in Portugal through Endesa and Enel Green Power (thermal and wind power generation).

EN18 In 2011, electricity generation from renewables displaced about 211,000 tonnes of CO_2 emissions into the atmosphere, with an increase equivalent to the one of electricity generation from renewables.

EN22 Waste recovery efforts continued. The only waste items which proved to have a significant correlation with the volume of activities were ash and gypsum from desulfurization in coal-fired thermal power plants.
The percentage of waste delivered to recovery operators in 2011 was above 80%.

EN26 Environmental enhancements.

Materials

> Use of biodegradable lubricating oils.

Water

> Water was saved by using the closed-cycle cooling system more efficiently and by reusing its drainage waters in the desulfurization process.

Waste

> Water- and leak-proofing of the temporary waste storage site in the Pego thermal plant and improvement of its leachate drainage system.
> Monitoring & control of the combustion process with a view to obtaining ash and gypsum suitable for complete reuse.

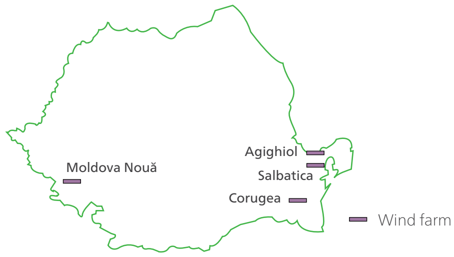
Other

> Awareness & training focused on environmental emergencies and subsequent assessment of personnel members' capability of response thereto.

Romania

Wind power generation

Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
5	269	132

Power installations

	Power plants no.	Net maximum electrical capacity MW
WIND	**5**	**269**

Wind power generation

Total: 269 MW

Equivalent yearly hours of utilization*

Wind: **492 hours**

* Yearly generation/capacity ratio.

Other data

Wind generation

Wind systems

Surface area occupied by platforms, service roads, buildings: **20 ha**

Net electricity generation

Total: 132 million kWh

Avoided CO_2 emissions

Due to wind generation: **100,848 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Romania

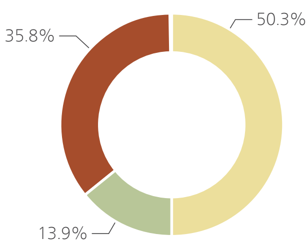
Electricity distribution

Enel Electrica Banat SA
Enel Electrica Dobrogea SA
Enel Electrica Muntenia Sud SA

Provinces (and corresponding company districts) served
- Enel Distributie Banat
- Enel Distributie Dobrogea
- Enel Distributie Muntenia
- Headquarters

The Numbers

Substations	Capacity (MVA)	Total lines (km)
21,015	21,089	89,240



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	279	12,964
Satellite substations and MV units	220	136
MV/LV	20,377	7,220
MV/MV	139	769
	21,015	**21,089**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	6,336	-	247	**6,583**
MV	22,644	30	11,766	**34,439**
LV	15,880	12,407	19,931	**48,218**
	44,860	**12,437**	**31,944**	**89,240**

Enel Distributie Banat and Enel Distributie Dobrogea have an ISO 14001-certified environmental management system in place, extended to their entire organization.

General data

Municipalities served: **2,115**

Surface area served: **61,799 km^2**

Customers connected to the grid: **2,609,029** (of which supplied by companies of the Group: **2,609,029**)

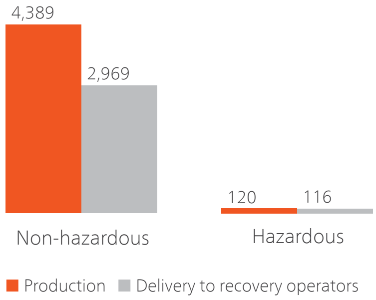
Resource consumption

Expendables: **96 t**

Gas oil: **22 toe**

Special waste

Total production: **4,509 t**
Total delivery to recovery operators: **3,085 t**



Electricity

Total electricity distributed:
14,263 million kWh

Own consumption for grid operation:
4 million kWh

Emissions into the atmosphere

SF_6: **27 kg** (606 t of CO_{2eq})

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants (wind)	no.	-	-	-	2	5
Net maximum electrical capacity (wind)	MW	-	-	-	64	269
Power lines (circuit-length)						
Total	km	53,228	90,240	91,550	89,240	89,944
high-voltage	km	4,114	5,090	6,023	6,583	6,584
medium-voltage	km	23,523	37,591	37,761	34,439	34,665
low-voltage	km	25,591	47,559	47,766	48,218	48,695
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.			1,162	1,161	1,142
special vehicles	no.			79	101	159
vehicles for both private and service use	no.			61	62	95
Gross real-estate surface area	thousand m^2			93.5	91.8	92.2

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Real-estate management	thousand toe			1.94	2.31	2.91
	TJ			81.3	96.5	122
EN4 **Primary electricity**						
Real-estate management	million kWh			10.9	5.37	10.8
Water for non-industrial uses						
Real-estate & service management	million m^3			0.150	0.160	0.147
EN1 **Expendables**						
Lubricating oil	t	0	0.240	0.830	1.80	1.24
Dielectric oil	t	277	164	91.9	94.6	115
Printing paper	t	0	0	74.2	100	123
Total	t	277	165	167	197	239
for electricity distribution	t	277	165	92.7	96.4	116
EN1 **PCB survey**						
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t	34.9	49.0	36.0	3.83	23.5
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t	2.09	6.79	3.09	0.202	11.3

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables (wind)	**million kWh**	**0**	**0**	**0**	**3.97**	**132**
Electricity distribution						
Electricity distributed	million kWh	7,253	10,909	13,224	13,827	14,263
EN4 Electricity consumption for grid operation	million kWh	23.5	34.3	23.7	21.3	23.8
EN6 **Sales**						
Open market						
Business segment						
Time-of-use offerings						
Customers	no.	0	20	39	41	47
Power sold	million kWh	0	3.17	11.3	6.41	7.42
Total						
Customers	no.	0	1,138	1,589	4,053	9,835
Power sold	million kWh	0	209	466	563	565
Large customers' segment						
Time-of-use offerings						
Customers	no.	0	7	6	4	8
Power sold	million kWh	0	33.8	20.0	22.1	32.7
Total						
Customers	no.	0	157	172	146	192
Power sold	million kWh	0	411	557	361	520
Universal-service market						
Household customers' segment						
Time-of-use offerings						
Customers	no.	0	3,885	9,065	6,263	6,063
Power sold	million kWh	0	9.94	18.1	17.9	18.7
Total						
Customers	no.	0	1,337,079	2,384,698	2,430,676	2,455,147
Power sold	million kWh	0	1,872	3,889	4,017	4,126
Non-household customers' segment						
Time-of-use offerings						
Customers	no.	0	5,122	14,310	11,216	10,421
Power sold	million kWh	0	262	3,124	1,656	1,567
Total						
Customers	no.	0	112,055	171,946	170,470	169,426
Power sold	million kWh	0	2,336	4,687	4,085	3,573
Overall power sold						
high-voltage	million kWh	0	212	369	294	300
medium-voltage	million kWh	0	579	2,153	1,630	1,395
low-voltage	million kWh	0	3,417	7,077	7,102	7,090
Total	**million kWh**	**0**	**4,208**	**9,599**	**9,026**	**8,785**

Emissions

	Source		2007	2008	2009	2010	**2011**
Emissions into the atmosphere							
EN16 CO_2	various activities	thousand t	0	0	5.62	6.71	8.38
EN16 SF_6	electricity distribution	kg	0	18.5	122	14.5	26.6
		thousand t of CO_2 equivalent	0	0.422	2.79	0.331	0.606
EN16 **Total greenhouse gases (CO_2, SF_6, CH_4)**		**thousand t of CO_2 equivalent**	**0**	**0.422**	**8.41**	**7.04**	**8.99**
EN18 Avoided CO_2 emissions							
Due to wind generation		thousand t	0	0	0	3.03	101
EN22 **Non-hazardous special waste**							
production	electricity distribution	t	2,215	2,447	2,112	3,330	4,389
delivery to recovery operators	electricity distribution	t	1,347	1,526	812	2,150	2,969
EN22 **Hazardous special waste**							
production	electricity distribution	t	215	70.5	93.9	73.6	120
of which with PCBs		*t*	*77.4*	*62.8*	*78.4*	*34.6*	*85.2*
delivery to recovery operators	electricity distribution	t	53.0	65.4	50.7	78.8	116
of which with PCBs		*t*	*53.0*	*57.7*	*46.0*	*74.0*	*85.2*
EN22 **Total special waste**	electricity distribution						
production		t	2,430	2,518	2,206	3,404	4,509
delivery to recovery operators		t	1,400	1,591	862	2,229	3,085

Indicators

		2007	2008	2009	2010	**2011**	% ('11-'07)/'07	% ('11-'10)/'10
EN29 **Land**								
LV cable lines								
overhead	% of entire LV grid	17.5	21.5	24.1	25.7	27.6	57.7	7.40
underground	% of entire LV grid	22.8	40.9	41.6	41.3	41.3	81.1	0
Total	**% of entire LV grid**	**40.2**	**62.4**	**65.6**	**67.1**	**68.9**	**71.4**	**2.70**
MV cable lines								
overhead	% of entire MV grid	0	0	0.098	0.086	0.175	0	103
underground	% of entire MV grid	16.9	36.4	36.9	34.2	34.7	105	1.50
Total	**% of entire MV grid**	**16.9**	**36.4**	**37.0**	**34.3**	**34.9**	**106**	**1.70**
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	26.9	48.3	49.8	49.7	51.0	89.6	2.60
Resource conservation and quality								
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.325	0.314	0.179	0.154	0.167	-48.6	8.40
Electricity generation from renewables								
wind	% of total generation	0	0	0	100	100	0	0

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN6 Sales								
Open market								
Business segment								
Time-of-use power sold	% of power sold		1.52	2.43	1.14	1.31		14.9
Large customers' segment								
Time-of-use power sold	% of power sold		8.22	3.59	6.13	6.28		2.40
Universal-service market								
Household customers' segment								
Time-of-use power sold	% of power sold		0.531	0.466	0.445	0.453		1.80
Non-household customers' segment								
Time-of-use power sold	% of power sold		11.2	66.7	40.5	43.9		8.40
Overall power sold								
high-voltage	% of power sold		5.05	3.85	3.26	3.42		4.90
medium-voltage	% of power sold		13.8	22.4	18.1	15.9		-12.2
low-voltage	% of power sold		81.2	73.7	78.7	80.7		2.50
Total time-of-use power sold	**% of power sold**		**7.33**	**33.1**	**18.9**	**18.5**		**-2.10**
Specific emissions into the atmosphere								
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0	0.100	0.494	0.050	0.068	0	36.0
EN22 Waste recovery								
Other non-hazardous special waste								
electricity distribution	% production	60.8	62.3	38.4	64.6	67.7	11.3	4.80
Other hazardous special waste								
electricity distribution	% production	24.6	92.7	54.0	107	96.7	293	-9.6
Total special waste								
electricity distribution	% production	57.6	63.2	39.1	65.5	68.4	18.8	4.40

Highlights of 2011

In Romania, Enel is active in wind power generation (through Enel Green Power), electricity distribution (through Enel Electrica Banat, Enel Electrica Dobrogea and Enel Electrica Muntenia) and sales.

EN5 EN6 EN18 In 2011, Enel Green Power commissioned the following wind farms, thus increasing its net maximum capacity in Romania by 205 MW:

> the wind farm of Corugea (70 MW) in the Tulcea region and the wind farm of Moldova Nouă (25 MW out of a total of 48 MW to be installed);
> the wind farm of Salbatica (70 MW) near Tulcea (northern Dobrogea).

EN6 Commercial activities included the offering of time-of-use rate plans, which encourage night-time electricity usage, thus enhancing the overall efficiency of the power system, diminishing wastage and negative impacts on the environment. In 2011, the percentage of power sold under these rate plans in the total power sold remained practically unaltered.

EN18 Electricity generation from renewables thus displaced over 101,000 tonnes of CO_2 emissions into the atmosphere.

EN22 The percentage of recovered waste continued to grow (from 65% to 68%) thanks to careful policies of separate collection and recovery (see details under EN26).

EN26 Environmental enhancements.

Waste

> Banat continued its partnership with Recolamp (non-profit organization) for recovering used lamps and bulbs.
> A survey was conducted to detect PCBs in 500 transformers. In the oil of two transformers, the PCB contents were equal to 99.4 and 56.7 ppm, respectively; the transformers will thus be decontaminated.

Noise

> Dobrogea mitigated noise emissions from MV/LV substations by replacing defective transformer fans.
> Banat replaced noisy metering equipment and purchased noise level meters to monitor noise emissions in densely populated areas.

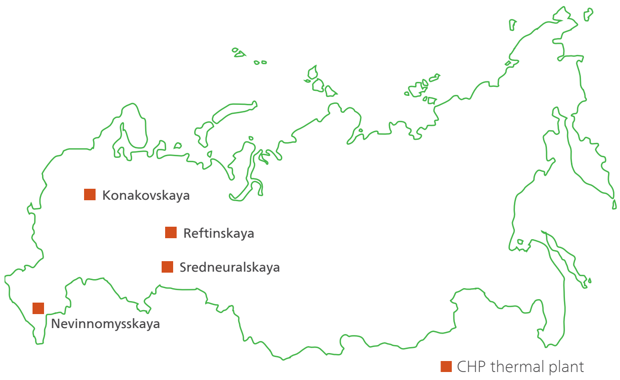
Soil and water

> Muntenia began a soil and groundwater monitoring survey near three of its HV/LV substations (Dudesti, Buftea and Giurgiu Vest); the survey indicated no soil pollution from hydrocarbons.

Russia

Combined heat
& power thermal generation

OGK-5



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
4	9,027	42,433

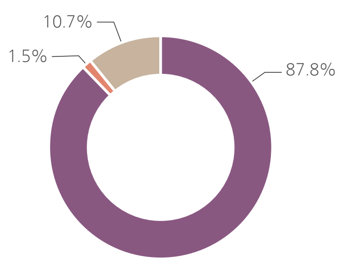
Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW	Useful thermal capacity 10^6 kcal/h
Steam (condensing)	4	33	7,923	1,784
Steam (back-pressure) for CHP	0	5	133	628
Combined-cycle gas turbines	0	3	971	200
	4	**41**	**9,027**	**2,612**

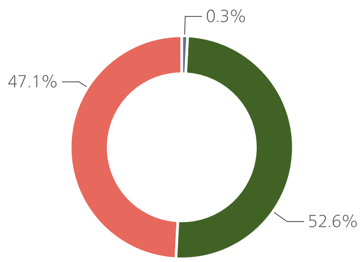
Net electricity generation
Total: 42,433 million kWh

Useful heat output (combined with power generation)
Total: 6,776,922 million kcal (equal to 7,882 million kWh)

Net maximum electrical capacity
Total: 9,027 MW



Fuel consumption
Total: 10,733,336 t of oil-equivalent

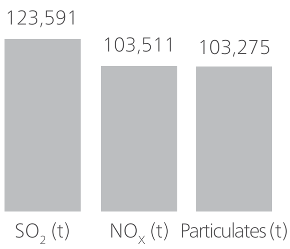


Waste waters

Discharged: **25,439,893 m³**
Used inside plants: **6,916,930 m³**

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

Emissions into the atmosphere



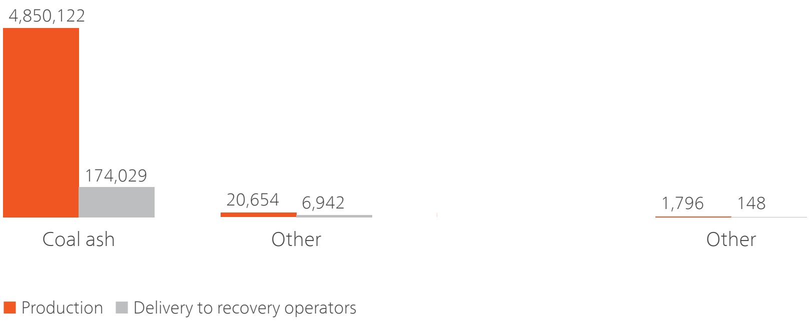
CO_2: **32,407,570 t**

Special waste

Total production: **4,872,573 t**
Total delivery to recovery operators: **181,119 t**

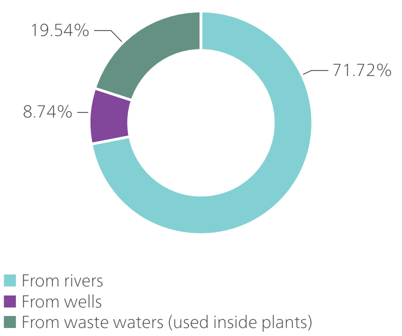
Non-hazardous
Production: 4,870,777 t
Delivery to recovery operators: 180,971 t

Hazardous
Production: 1,796 t
Delivery to recovery operators: 148 t



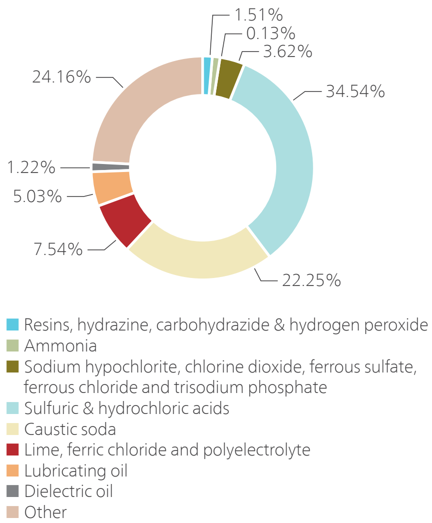
Water for industrial uses

Total requirements: 35,402,030 m³
Total abstraction from inland waters: 28,485,100 m³



Expendables

Total: 7,461 t



Environmental Results

Status data

		2008	2009	2010	2011
Combined heat & power installations					
Power plants (thermal)	no.	4	4	4	4
Net maximum electrical capacity (thermal)	MW	8,183	8,198	8,198	9,027
Useful thermal capacity (thermal)	million kcal/h	2,373	2,406	2,406	2,612
Mining & extracting activities					
Extracting activities					
Areas occupied by excavations, drilling and other activities	ha	500	-	-	-
EN29 **Real-estate & service management**					
Vehicle fleet					
service vehicles	no.	na	na	14	6

Resources

		2008	2009	2010	2011
EN1 EN3 **Fossil fuels**					
Thermal generation (CHP)					
fuel oil (MS)	thousand t	55.4	59.7	50.0	33.6
	thousand toe	53.6	56.4	48.4	32.9
natural gas	million m^3	3,906	6,143	6,716	7,421
	thousand toe	3,154	4,976	5,449	5,642
technologically captive use in combined-cycle units	*million m^3*	*168*	*51.0*	*88.4*	*330*
	thousand toe	*139*	*42.5*	*73.1*	*269*
non-technologically captive use	*million m^3*	*3,738*	*6,092*	*6,628*	*7,091*
	thousand toe	*3,015*	*4,933*	*5,376*	*5,373*
coal	thousand t	7,280	11,630	13,654	12,572
	thousand toe	2,806	4,852	5,325	5,059
Total	**thousand toe**	**6,014**	**9,884**	**10,823**	**10,733**
	TJ	**251,792**	**413,825**	**453,139**	**449,383**
Various activities	thousand toe	1.31	0	0.059	0.053
Grand total	**thousand toe**	**6,015**	**9,884**	**10,823**	**10,733**
	TJ	**251,847**	**413,825**	**453,141**	**449,386**
EN4 **Primary electricity**					
Real-estate management	million kWh	0	0	0	0.805
EN8 **Water for industrial uses**					
From rivers (including meteoric waters from secondary rainfall)	million m^3	36.0	35.0	27.9	25.4
From wells	million m^3	0.310	2.94	3.11	3.09
Total abstraction from inland waters	**million m^3**	**36.4**	**38.0**	**31.0**	**28.5**
EN10 From waste waters (used inside plants)	million m^3	8.46	8.48	7.67	6.92
Total requirements	**million m^3**	**44.8**	**46.4**	**38.7**	**35.4**
for thermal generation (CHP)	million m^3	44.8	46.4	38.7	35.4
for mining & extracting activities	million m^3	0.025	0	0	0
EN8 EN21 **Open-cycle cooling water**					
For thermal generation (CHP)	million m^3	4,012	6,463	7,735	7,377
Water for non-industrial uses					
Real-estate & service management	million m^3	0	0	0	0.002

		2008	2009	2010	2011
EN1 **Expendables**					
Resins	t	64.1	345	173	111
Hydrazine	t	1.99	1.70	1.53	1.74
Hydrogen peroxide	t	0.001	0	0	0
Ammonia	t	14.2	11.0	8.40	9.33
Sodium hypochlorite	t	0	0	2.93	5.82
Ferrous sulfate	t	213	200	253	256
Trisodium phosphate	t	7.17	11.6	8.51	8.97
Lime	t	384	735	611	562
Sulfuric & hydrochloric acids	t	1,583	2,704	2,276	2,577
Caustic soda	t	1,080	1,632	1,553	1,660
Lubricating oil	t	225	452	342	376
Dielectric oil	t	97.0	162	166	90.9
Printing paper	t	0	0	15.0	4.29
Other	t	1,009	1,849	1,708	1,802
Total	**t**	**4,678**	**8,103**	**7,119**	**7,465**
for thermal generation (CHP)	t	4,678	8,103	7,104	7,461

Processes and products

		2008	2009	2010	2011
Electricity generation (net)					
From fossil fuels (combined with heat generation)	**million kWh**	**23,752**	**39,112**	**42,835**	**42,433**
natural gas	million kWh	12,148	19,066	20,844	22,410
coal	million kWh	11,605	20,046	21,991	20,023
Useful heat output (combined with power generation)					
In thermal power plants	**million kcal**	**3,982,193**	**6,766,684**	**6,519,608**	**6,776,922**
	million kWh	**4,631**	**7,870**	**7,582**	**7,882**
EN6 **Sales**					
Open market					
Residential segment					
Time-of-use offerings					
Customers	no.	0	4,615	0	0
Power sold	million kWh	0.010	20.8	0	0
Total					
Customers	no.	0	100,338	95,206	88,052
Power sold	million kWh	0.440	223	239	269
Business segment					
Time-of-use offerings					
Customers	no.	0	18	0	0
Power sold	million kWh	0.020	4.35	0	0
Total					
Customers	no.	0	4,484	4,728	4,507
Power sold	million kWh	1.42	3,325	306	277
Large customers' segment					
Total					
Customers	no.	0	0	99	127
Power sold	million kWh	2.55	0	921	1,412

		2008	2009	2010	2011
Very large customers' segment					
Total					
Customers	no.	0	1	31	34
Power sold	million kWh	30.5	16,069	19,616	20,694
Overall power sold					
high-voltage	million kWh	30.5	17,749	19,405	20,834
medium-voltage	million kWh	3.67	1,405	1,345	1,431
low-voltage	million kWh	0.810	462	332	387
Total	**million kWh**	**34.9**	**19,617**	**21,082**	**22,653**

Emissions

	Source		2008	2009	2010	2011
Emissions into the atmosphere						
EN20 SO_2	thermal generation (CHP)	thousand t	80.8	124	147	124
EN20 NO_X	thermal generation (CHP)	thousand t	49.3	93.5	120	104
EN20 Particulates	thermal generation (CHP)	thousand t	93.5	120	148	103
EN16 CO_2	fossil-fired thermal generation (CHP) (from combustion)	thousand t	19,136	31,202	33,988	32,408
	various activities	thousand t	3.90	0	0.181	0.157
EN16 SF_6	electricity generation	kg	42.5	47.2	18.7	26.3
		thousand t of CO_2 equivalent	0.968	1.08	0.427	0.600
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**19,141**	**31,203**	**33,989**	**32,408**
EN21 **Waste waters (discharged quantity)**	thermal generation (CHP)	million m^3	17.8	34.6	34.2	25.4
EN21 **Conventional polluting load in waste waters discharged by plants**						
Metals and compounds (expressed as metal equivalents)	thermal generation (CHP)	kg	89,549	53,085	42,430	46,111
	in some plants with an overall capacity of	MW	8,183	6,979	6,979	5,135
Total nitrogen (expressed as N)	thermal generation (CHP)	kg	0	0	0	34.1
	in some plants with an overall capacity of	MW	0	0	0	2,277
BOD	thermal generation (CHP)	kg	0	694	0	102
	in some plants with an overall capacity of	MW	0	2,252	0	2,277
EN22 **Non-hazardous special waste**						
Coal bottom ash	fossil-fired thermal generation (CHP)					
production		t	144,032	214,636	274,951	242,506
Coal flyash	fossil-fired thermal generation (CHP)					
production		t	2,736,606	4,078,082	5,076,426	4,607,616
delivery to recovery operators		t	119,673	93,584	135,463	174,029
Other	electricity generation					
production		t	12,343	19,455	19,432	20,654
delivery to recovery operators		t	0	5,338	3,759	6,942
Total	**electricity generation**					
production		t	2,892,981	4,312,173	5,370,809	4,870,777
delivery to recovery operators		t	119,673	98,922	139,222	180,971

	Source		2008	2009	2010	2011
EN22 **Hazardous special waste**	electricity generation					
production		t	1,607	399	462	1,796
of which with PCBs		*t*	*158*	*258*	*199*	*207*
delivery to recovery operators		t	2.40	364	223	148
of which with PCBs		*t*	*0*	*307*	*207*	*139*
EN22 **Total special waste**	electricity generation					
production		t	2,894,588	4,312,572	5,371,272	4,872,573
delivery to recovery operators		t	119,676	99,285	139,444	181,119

Indicators

		2008	2009	2010	2011	% ('11-'10)/'10
Resource conservation and quality						
EN1 EN3 Net heat rate of thermal generation (CHP)	kcal/kWh	2,119	2,104	2,147	2,133	-0.700
EN8 Net specific requirements of water for industrial uses in thermal generation (CHP)	liters/kWh	1.58	0.988	0.767	0.704	-8.20
EN8 Coverage of requirements of water for industrial uses						
from rivers (including meteoric waters from secondary rainfall)	% of requirements	80.4	75.4	72.1	71.7	-0.600
from wells	% of requirements	0.683	6.33	8.04	8.74	8.70
Total from inland waters	**% of requirements**	**81.1**	**81.7**	**80.2**	**80.5**	**0.400**
EN10 from waste waters (used inside plants)	% of requirements	18.9	18.3	19.8	19.5	-1.50
EN1 EN3 Fossil fuel consumption for thermal generation						
fuel oil	% of total fuel consumption	0.891	0.571	0.448	0.307	-31.5
natural gas	% of total fuel consumption	52.4	50.3	50.4	52.6	4.40
coal	% of total fuel consumption	46.7	49.1	49.2	47.1	-4.30
MS fuel oil	% of total fuel oil consumption	100	100	100	100	0
natural gas, technologically captive use	% of total natural gas consumption	4.41	0.855	1.34	4.76	255
of which in combined-cycle units	*% of total natural gas consumption*	*4.41*	*0.855*	*1.34*	*4.76*	*255*
natural gas, non-technologically captive use	% of total natural gas consumption	95.6	99.1	98.7	95.2	-3.5
EN6 **Sales**						
Residential segment						
Time-of-use power sold	% of power sold	2.27	9.35	0	0	0
Business segment						
Time-of-use power sold	% of power sold	1.41	0.131	0	0	0
Overall power sold						
high-voltage	% of power sold	87.2	90.5	92.0	92.0	0
medium-voltage	% of power sold	10.5	7.16	6.38	6.32	-0.900
low-voltage	% of power sold	2.32	2.36	1.57	1.71	8.90
Total time-of-use power sold	% of power sold	0.086	0.128	0	0	0
Specific emissions into the atmosphere						
EN20 SO_2 (thermal generation - CHP)	g/kWh thermal net	2.85	2.63	2.92	2.46	-15.8
EN20 NO_X (thermal generation - CHP)	g/kWh thermal net	1.74	1.99	2.38	2.06	-13.4
EN20 Particulates (thermal generation - CHP)	g/kWh thermal net	3.29	2.54	2.93	2.05	-30.0
EN16 CO_2 (thermal generation - CHP)	g/kWh thermal net	674	664	674	644	-4.50
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.919	1.10	0.267	0.348	30.3

		2008	2009	2010	2011	% ('11-'10)/'10
Net specific conventional polluting load of waste waters discharged by installations (thermal generation - CHP)						
Metals and compounds (expressed as metal equivalents)	mg/kWh	0	0	0.985	1.40	42.1
Total nitrogen (expressed as N)	mg/kWh	0	0	0	0.004	0
BOD	mg/kWh	0	0	0	0.011	0
EN22 **Specific waste production**						
Coal and brown-coal ash (thermal generation - CHP)	g/kWh net from coal and brown coal	242	209	238	236	-0.800
EN22 **Waste recovery**						
Coal and brown-coal flyash	% production	4.15	2.18	2.53	3.59	41.9
Other non-hazardous special waste						
electricity generation	% production	0	27.4	19.3	33.6	74.1
Total non-hazardous special waste						
electricity generation	% production	4.14	2.29	2.59	3.72	43.6
Other hazardous special waste						
electricity generation	% production	0.149	91.2	48.1	8.24	-82.9
Total special waste						
electricity generation	% production	4.13	2.30	2.60	3.72	43.1

Highlights of 2011

EN1 EN3 With respect to 2010, the fuel mix had a slight decrease of coal (from 49% to 47%) and a corresponding increase of natural gas (53%), in spite of an equivalent level of generation (about 42 TWh).

EN5 EN6 EN18 Enel OGK-5 commissioned two 410 MW combined-cycle gas turbine (CCGT) CHP plants in the sites of the plants of Sredneuralskaya (close to Ekaterinburg, in the Urals region) and of Nevinnomysskaya (Stavropolsky Kray, Caucasus region).

EN8 EN10 In 2011, net specific requirements of water for industrial uses in thermal generation continued to decline (-~9%), with a value of 0.704 l/kWh (vs. 0.767 l/kWh in 2010), thanks to improvements of equipment and operating conditions (see EN26).

The following are the results achieved in terms of specific emissions of major pollutants into the atmosphere:

EN16 Net specific emissions of CO_2, referred to overall electricity generation, passed from 674 to 644 g/kWh, thanks to the entry into operation of two new high-efficiency natural-gas CCGT plants.

EN20 The sharp decrease of net specific emissions of macro-pollutants (SO_2, NO_X and particulates) as against 2010 was due to the higher share of natural-gas in the fuel mix (see EN1 EN3), resulting into reductions of ~16%, ~14% and ~43%, respectively.

EN22 The increase in non-hazardous waste recovery in 2011 was due to the higher amount of coal flyash recovered.

In Russia, Enel is involved in thermal power generation (through OGK-5) and electricity sales (through RusEnergoSbyt).

EN26 Environmental enhancements.

Water

> Better water resource management made it possible to save water in the plants of Nevinnomiskaya and Konakovskaya.

> In the course of 2012, a dry ash-removal system, significantly reducing water consumption, will be installed.

Emissions

> Entry into operation of two combined-cycles (in the Nevinnomisskaya – NGRES – and Sredneuralskaya – SGRES – sites) with high efficiencies and low specific emissions into the atmosphere.

> Reftinskaya (RGRES) plant: revamping of unit 5 with installation of low-NO_X burners and particulate bag filters.

Waste

> In the course of 2012, a dry ash-removal system will be installed to recover a higher amount of ash (ash recovery mounted to about 30% in 2011).

Other

> OGK-5 gained the ISO 14001 certification for all of its activities.

> As part of the environmental management system, a plan of awareness, training & education, intended for managers, operational personnel and contractors, was implemented.

Slovakia

Combined heat
& power thermal generation

Slovenské elektrárne AS

Brown coal- and biomass-fired thermal power plant
Coal-, natural gas- and biomass-fired thermal power plant

The Numbers

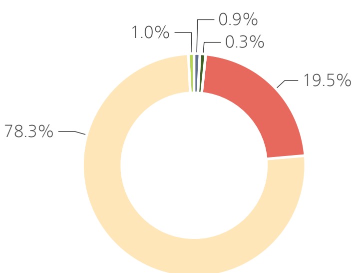
Power plants	Net capacity (MW)	Generation (million kWh)
2	1,254	2,283

Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW	Useful thermal capacity 10^6 kcal/h
Steam (condensing) with intermediate steam extraction for CHP	**2**	**13**	**1,254**	**423**

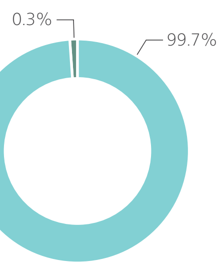
The two power plants have an ISO 14001-certified environmental management system in place.

Fuel consumption
Total: 765,563 t of oil-equivalent



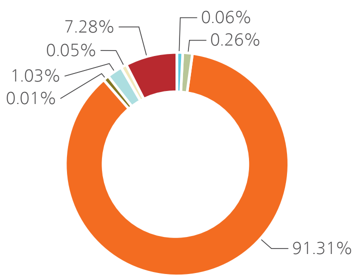
- Fuel oil
- Natural gas
- Coal
- Brown coal
- Biomass & waste

Water for industrial uses
Total requirements: 12,547,770 m³
Total abstraction from inland waters: 12,505,470 m³



- From rivers
- From waste waters (used inside plants)

Expendables
Total: 97,212 t



- Resins, hydrazine, carbohydrazide & hydrogen peroxide
- Ammonia
- Limestone for flue-gas desulfurization
- Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate
- Sulfuric & hydrochloric acids
- Caustic soda
- Lime, ferric chloride and polyelectrolyte

Net electricity generation

2,283 million kWh

Useful heat output (combined with power generation)

351,819 million kcal
equal to 409 million kWh

Waste waters

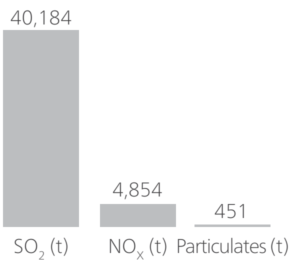
Discharged: **5,404,116 m^3**
Used inside plants: **42,301 m^3**

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

Avoided CO_2 emissions

Due to generation from biomass and biodegradable fraction of waste: **24,293 t**

Emissions into the atmosphere



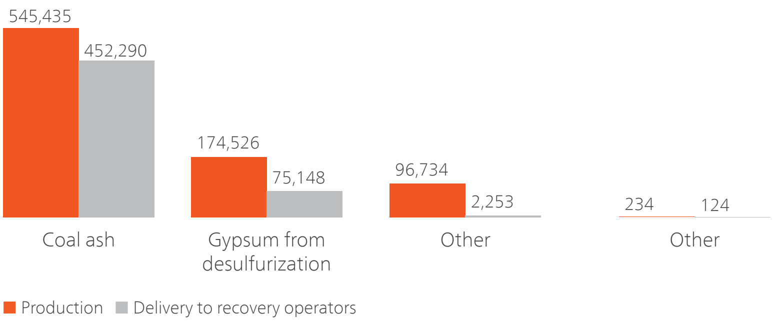
CO_2 (t)	2,972,154
from combustion	*2,932,720*
from desulfurization	*39,434*

Special waste

Total production: **817,928 t**
Total delivery to recovery operators: **529,815 t**

Non-hazardous
Production: 817,694 t
Delivery to recovery operators: 529,691 t

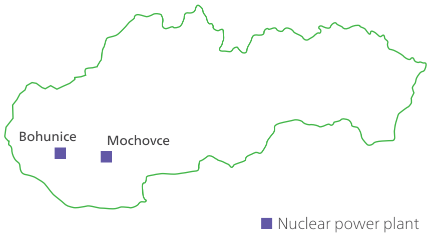
Hazardous
Production: 234 t
Delivery to recovery operators: 124 t



Slovakia

Nuclear combined heat & power generation

Slovenské elektrárne AS



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
2	1,818	14,340

Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW	Useful thermal capacity 10^6 kcal/h
Steam (condensing)	**2**	**4**	**1,818**	**464**

The two power plants have an ISO 14001-certified environmental management system in place.

Useful heat output (combined with power generation)

Total: 527,923 million kcal (equal to 614 million kWh)

The heat is supplied to district heating systems and to industrial consumers.

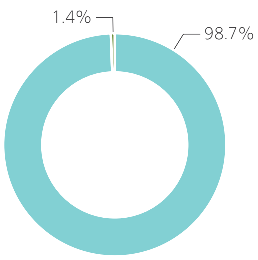
Net electricity generation

Total: 14,340 million kWh

Water for industrial uses

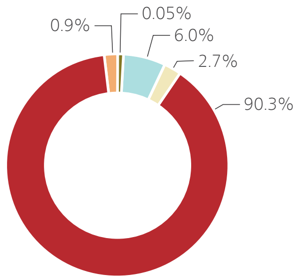
Total requirements: 43,744,626 m^3

Abstraction from inland waters: 43,149,362 m^3



Expendables

Total: 6,722 t



Radionuclides in discharged waste waters

Tritium

20,960 GBq

Waste waters

Discharged: **9,281,276 m³**
Used inside plants: **595,264 m³**

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

Avoided CO_2 emissions

Due to nuclear generation: **15,079,383 t**

Radioactive emissions into the atmosphere

Noble gases 10.45 TBq

Iodine 131 0.979 MBq

Aerosol β and γ 16.0 MBq

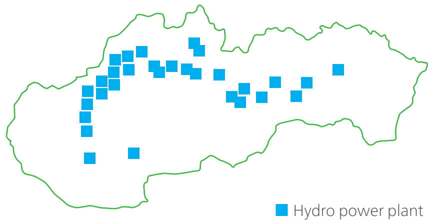
Aerosol α 3.58 kBq

Strontium 89 and 90 64.7 kBq

Slovakia

Hydro power generation

Slovenské elektrárne AS



The Numbers

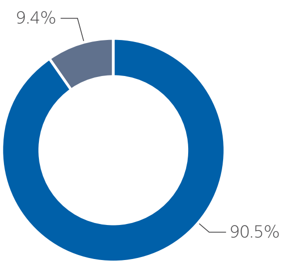
Power plants	Net capacity (MW)	Generation (million kWh)
34	2,328	3,791

Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	16	43	1,042
Pondage/reservoir	14	31	279
Pure/mixed pumped storage	4	15	1,007
	34	**89**	**2,328**

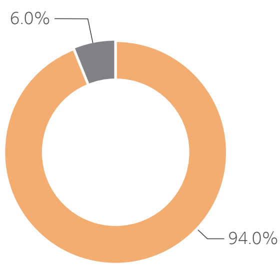
All the power plants are ISO 14001-certified.

Net electricity generation
Total: 3,791 million kWh



Hydro from natural flows
Hydro from pumped storage

Expendables
Total: 84 t



Lubricating oil
Dielectric oil

Equivalent yearly hours of utilization*

2,597 Hydro

* Yearly generation/capacity ratio (excluding hydro from pumped storage).

Avoided CO_2 emissions

Due to hydro generation from natural flows: **3,608,499 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Other data

Fish ladders: **5**

Emissions into the atmosphere

SF_6 - all types of generation (kg)		209
	(t of CO_{2eq})	4,642

Gas oil

5 toe

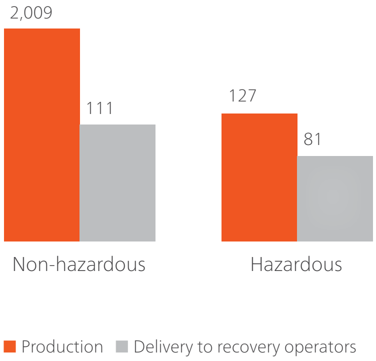
Total consumption

Used for feeding emergency generating sets.

Special waste

Total production: **2,136 t**

Total delivery to recovery operators: **191 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants (hydro)	no.	30	30	30	34	34
Net maximum electrical capacity (hydro)	MW	1,589	1,590	1,590	2,329	2,329
Combined heat & power installations						
Power plants	no.	4	4	4	4	4
thermal	no.	2	2	2	2	2
nuclear	no.	2	2	2	2	2
Net maximum electrical capacity	MW	2,894	2,966	3,012	3,070	3,072
thermal	MW	1,254	1,254	1,250	1,254	1,254
nuclear	MW	1,640	1,712	1,762	1,816	1,818
Useful thermal capacity	million kcal/h	428	787	887	887	887
thermal	million kcal/h	39.7	373	423	423	423
nuclear	million kcal/h	389	413	464	464	464
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.	0	0	395	422	399
special vehicles	no.	0	0	208	159	102

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Combined heat & power generation						
fuel oil (LS)	thousand t	5.17	5.37	5.42	8.42	7.23
	thousand toe	5.14	5.34	5.35	8.37	7.03
natural gas - non-technologically captive use	million m^3	11.8	5.17	3.89	5.87	3.24
	thousand toe	9.67	4.23	3.19	4.83	2.37
coal	thousand t	837	656	363	279	249
	thousand toe	502	398	221	169	149
brown coal	thousand t	1,981	2,318	2,308	2,273	2,424
	thousand toe	505	585	571	575	600
Total	thousand toe	1,021	992	801	757	758
	TJ	42,745	41,550	33,523	31,698	31,738
Various activities	thousand toe	0.564	1.33	1.72	1.88	2.04
Grand total	**thousand toe**	**1,022**	**994**	**802**	**759**	**760**
	TJ	**42,769**	**41,605**	**33,595**	**31,777**	**31,823**

		2007	2008	2009	2010	2011
EN1 EN3 Biomass and waste						
Combined heat & power generation						
solid biomass	t	0	350	8,311	22,286	27,186
	toe	0	66.9	2,190	6,055	7,524
Grand total	**thousand toe**	**0**	**0.067**	**2.19**	**6.06**	**7.52**
	TJ	**0**	**2.81**	**91.7**	**254**	**315**
EN1 EN3 Nuclear fuel						
Nuclear combined heat & power generation						
Uranium	t	36.6	37.5	36.0	37.4	38.5
	thousand toe	0	0	3,727	3,782	3,972
	TJ	0	0	156,043	158,364	166,281
EN4 Primary electricity						
Real-estate management	million kWh	0	0	1.41	1.94	1.77
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	52.6	55.2	55.0	54.1	55.7
EN10 From waste waters (used inside plants)	million m^3	0.291	0.543	0.432	0.570	0.637
Total requirements	**million m^3**	**52.9**	**55.7**	**55.4**	**54.7**	**56.3**
for thermal generation (CHP)	million m^3	15.8	17.2	15.0	13.7	12.5
for nuclear generation (CHP)	million m^3	37.0	38.5	40.4	41.0	43.7
EN8 EN21 Open-cycle cooling water						
For thermal generation (CHP)	million m^3	0	3.26	0.428	0.636	0
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0.419	0.440	0.432
EN1 Expendables						
Resins	t	0	0	2.50	26.5	26.5
Hydrazine	t	57.1	12.5	15.3	15.5	15.6
Ammonia	t	2,357	1,464	835	416	261
Limestone for flue-gas desulfurization	t	77,568	84,861	85,377	72,619	88,768
Sodium hypochlorite	t	17.3	28.2	23.8	6.11	5.90
Chlorine dioxide	t	0	0	0.514	0.875	0.709
Trisodium phosphate	t	7.19	6.86	7.92	8.07	5.80
Lime	t	15,832	23,218	18,545	14,681	13,018
Ferric chloride	t	61.1	119	105	108	96.4
Polyelectrolyte	t	0	0	0	36.9	33.6
Sulfuric & hydrochloric acids	t	1,386	1,563	1,530	1,430	1,406
Caustic soda	t	861	470	439	288	234
Lubricating oil	t	40.5	165	125	105	195
Dielectric oil	t	9.66	133	4.46	2.92	5.00
Printing paper	t	0	0	54.0	61.2	71.5
Other	t	2.10	3.49	0	0	0.200
Total	**t**	**98,200**	**112,044**	**107,065**	**89,804**	**104,143**
for thermal generation (CHP)	t	92,403	106,077	100,593	83,517	97,212
for nuclear generation (CHP)	t	5,771	5,738	6,361	6,145	6,776
for hydro generation	t	25.2	229	57	81.4	83.6

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (combined with heat generation)	**million kWh**	**3,123**	**2,996**	**2,400**	**2,235**	**2,259**
fuel oil & gas oil	million kWh	14.5	15.5	15.5	23.8	20.4
natural gas (1)	million kWh	-8.076	-7.569	10.6	13.9	7.84
coal	million kWh	1,693	1,348	734	558	493
brown coal	million kWh	1,424	1,640	1,640	1,639	1,738
From renewables	**million kWh**	**1,881**	**1,715**	**1,830**	**4,813**	**3,455**
biomass and biodegradable fraction of waste	million kWh	0	0	7.31	20.2	23.1
hydro from natural flows	million kWh	1,881	1,715	1,823	4,793	3,432
Hydro from pumped storage	**million kWh**	**171**	**195**	**235**	**386**	**360**
Nuclear generation (combined with heat generation)	**million kWh**	**11,395**	**12,164**	**13,055**	**13,534**	**14,340**
Total	**million kWh**	**16,569**	**17,069**	**17,521**	**20,968**	**20,414**
simple	million kWh	2,051	1,910	2,058	5,179	3,791
combined with heat generation	million kWh	14,518	15,159	15,463	15,789	16,622
Electricity consumption for pumping	million kWh	224	275	321	528	494
Useful heat output (combined with power generation)						
In thermal power plants (fossil fuels)	million kcal	431,998	401,871	359,842	382,203	351,819
fossil fuels	*million kcal*	*431,998*	*401,871*	*359,842*	*382,203*	*346,589*
biomass and biodegradable fraction of waste	*million kcal*	*0*	*0*	*0*	*0*	*5,230*
In nuclear power plants	million kcal	454,001	478,592	541,146	596,857	527,923
Total	**million kcal**	**885,999**	**880,463**	**900,988**	**979,060**	**879,742**
	million kWh	**1,030**	**1,024**	**1,048**	**1,139**	**1,023**

(1) The values for 2007 and 2008 are negative because they consider the electricity consumed by auxiliaries under conditions of no generation.

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation (CHP)	thousand t	33.2	35.9	32.9	36.9	40.2
EN20 NO_X	thermal generation (CHP)	thousand t	6.53	5.69	5.21	4.53	4.85
EN20 Particulates	thermal generation (CHP)	thousand t	0.748	0.626	0.543	0.379	0.451
EN16 CO_2	*fossil-fired thermal generation (CHP) (from combustion)*	*thousand t*	*4,069*	*4,042*	*3,362*	*2,973*	*2,933*
	fossil-fired thermal generation (CHP) (from desulfurization)	*thousand t*	*34.1*	*37.3*	*37.6*	*35.0*	*39.4*
	total from fossil-fired thermal generation (CHP)	thousand t	4,103	4,079	3,400	3,008	2,972
	various activities	thousand t	1.40	0	2.88	2.64	3.24
	Total	**thousand t**	**4,104**	**4,079**	**3,403**	**3,011**	**2,975**
EN16 SF_6	electricity generation	kg	244	246	198	83.0	222
		thousand t of CO_2 equivalent	5.57	5.62	4.52	1.89	5.07
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**4,110**	**4,085**	**3,407**	**3,012**	**2,980**

	Source		2007	2008	2009	2010	2011
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	2,238	2,003	2,129	5,040	3,608
Due to electricity generation from biomass and biodegradable fraction of waste		thousand t	0	0	8.54	21.3	24.3
Due to generation from renewables		**thousand t**	**2,238**	**2,003**	**2,138**	**5,062**	**3,633**
Due to nuclear generation		**thousand t**	**14,191**	**14,857**	**15,983**	**14,962**	**15,725**
Total		**thousand t**	**16,429**	**16,861**	**18,121**	**20,023**	**18,712**
EN20 Radioactive emissions into the atmosphere	nuclear generation (CHP)						
Noble gases		TBq	9.17	6.52	6.56	8.51	10.5
Iodine 131		MBq	10.6	0.648	0.556	0.608	0.979
Aerosols β and γ		MBq	20.5	18.1	20.8	18.7	16.0
Aerosols α		kBq	26.8	13.7	22.6	6.49	3.58
Strontium 89 and 90		kBq	183	133	91.5	74.7	64.7
EN21 Waste waters (discharged quantity)	thermal generation (CHP)	million m^3	12.6	9.42	5.91	5.49	5.40
	nuclear generation (CHP)	million m^3	7.30	8.14	8.22	9.06	9.28
	Total	**million m^3**	**19.9**	**17.6**	**14.1**	**14.6**	**14.7**
EN21 Conventional pollutant load in waste waters discharged by plants							
Metals and compounds (expressed as metal equivalents)	nuclear generation (CHP)	kg	169	168	158	366	257
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
Total nitrogen (expressed as N)	nuclear generation (CHP)	kg	86,596	40,295	34,566	32,130	33,275
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
Total phosphorus (expressed as P)	nuclear generation (CHP)	kg	2,387	2,319	2,213	2,491	2,721
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
COD	thermal generation (CHP)	kg	222,085	117,379	71,867	75,484	94,625
	in some plants with an overall capacity of	MW	1,254	1,254	1,234	1,254	1,234
	nuclear generation (CHP)	kg	117,003	105,591	111,648	140,870	134,170
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total	**kg**	**339,088**	**222,970**	**183,515**	**216,354**	**228,795**
BOD	thermal generation (CHP)	kg	30,618	12,450	12,405	11,696	16,622
	in some plants with an overall capacity of	MW	1,254	1,254	1,234	1,254	1,234
	nuclear generation (CHP)	kg	15,290	15,497	17,605	16,021	21,474
	on an overall capacity of	MW	1,640	1,712	1,762	1,816	1,818
	Total	**kg**	**45,908**	**27,947**	**30,009**	**27,717**	**38,096**
EN21 Radionuclides in waste waters discharged by plants	nuclear generation (CHP)						
Tritium		GBq	12,970	12,444	21,621	19,359	20,960
Corrosion and fission products		GBq	0.029	0.034	0.032	0.035	0.038
EN22 Non-hazardous special waste							
Coal bottom ash	fossil-fired thermal generation (CHP)						
production		t	134,980	141,754	108,238	56,970	90,714
delivery to recovery operators		t	0	0	59,087	45,187	70,193
Coal flyash	fossil-fired thermal generation (CHP)						
production		t	317,066	312,060	316,529	355,049	455,721
delivery to recovery operators		t	185,303	213,436	165,057	164,358	382,097

	Source		2007	2008	2009	2010	**2011**
Gypsum from desulfurization	fossil-fired thermal generation (CHP)						
production		t	46,013	23,127	7,673	8,212	174,526
delivery to recovery operators		t	27,747	18,359	7,673	8,212	75,148
Other							
production	*electricity generation*	*t*	*464,519*	*513,498*	*386,088*	*332,789*	*117,573*
	various activities	*t*	*0*	*0*	*149*	*35.9*	*13.8*
	Total	t	464,519	513,498	386,237	332,825	117,587
delivery to recovery operators	electricity generation	t	4,542	12,160	15,358	19,979	15,360
Total							
production	*electricity generation*	*t*	*962,578*	*990,439*	*818,528*	*753,020*	*838,534*
	various activities	*t*	*0*	*0*	*149*	*35.9*	*13.8*
	Total	t	962,578	990,439	818,677	753,056	838,548
delivery to recovery operators	electricity generation	t	217,593	243,955	247,174	237,735	542,798
EN22 **Hazardous special waste**							
production	electricity generation	t	9,434	769	1,017	490	506
	various activities	t	0	0	1,017	0.023	0.030
of which with PCBs	*electricity generation*	*t*	*235*	*404*	*400*	*306*	*274*
	various activities	*t*	*0*	*0*	*400*	*0*	*0*
delivery to recovery operators	electricity generation	t	1,542	280	584	377	331
of which with PCBs	*electricity generation*	*t*	*170*	*164*	*397*	*304*	*272*
EN22 **Total special waste**							
production	electricity generation	t	972,012	991,208	819,545	753,510	839,039
	various activities	t	0	0	1,166	35.9	13.9
delivery to recovery operators	electricity generation	t	219,135	244,235	247,758	238,112	543,129
EN22 **Radioactive waste**							
Low- and intermediate-level: production	nuclear generation (CHP)						
liquid		m^3	121	118	90.2	76.2	56.6
solid		t	37.9	39.4	31.7	29.3	31.0

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation (CHP)	kcal/kWh	2,816	2,866	2,841	2,827	2,844	1	0.600
EN1 EN3 Net efficiency of hydro generation from pumped storage	%	76.2	70.7	73.3	73.0	72.8	-4.50	-0.300
EN8 Net specific requirements of water for industrial uses in thermal generation (CHP)	liters/kWh	4.37	4.98	5.31	5.08	4.66	6.60	-8.30
EN8 Net specific requirements of water for industrial uses in nuclear generation (CHP)	liters/kWh	3.11	3.02	2.95	2.88	2.93	-5.80	1.70
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	99.4	99.0	99.2	99.0	98.9	-0.500	-0.100
EN10 from waste waters (used inside plants)	% of requirements	0.551	0.975	0.780	1.04	1.13	105	8.70
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	0.503	0.538	0.668	1.11	0.927	84.3	-16.5
natural gas	% of total fuel consumption	0.947	0.427	0.398	0.637	0.312	-67.1	-51.0
coal	% of total fuel consumption	49.1	40.1	27.7	22.3	19.7	-59.9	-11.7
brown coal	% of total fuel consumption	49.4	59	71.3	76.0	79.1	60.1	4.10
LS fuel oil	% of total fuel oil consumption	100	100	100	100	100	0	0
natural gas, non-technologically captive use	% of total natural gas consumption	100	100	100	100	100	0	0
Electricity generation from renewables								
thermal from biomass & biodegradable fraction of waste	% of total generation	0	0	0.042	0.096	0.113	0	17.7
hydro from natural flows	% of total generation	11.4	10.0	10.4	22.9	16.8	47.4	-26.6
Total	**% of total generation**	**11.4**	**10.0**	**10.4**	**23.0**	**16.9**	**48.2**	**-26.5**
Specific emissions into the atmosphere								
EN20 SO_2 (CHP)	g/kWh thermal net	9.15	10.4	11.6	13.7	14.9	62.8	8.80
EN20 NO_X (CHP)	g/kWh thermal net	1.80	1.64	1.84	1.68	1.80	0	7.10
EN20 Particulates (CHP)	g/kWh thermal net	0.206	0.181	0.192	0.140	0.168	-18.4	20.0
EN16 CO_2 (CHP)	g/kWh thermal net	1,132	1,178	1,203	1,114	1,104	-2.50	-0.900
EN20 SO_2 (total from thermal generation - simple and CHP)	g/kWh total net	1.89	1.99	1.77	1.67	1.88	-0.500	12.6
EN20 NO_X (total from thermal generation - simple and CHP)	g/kWh total net	0.371	0.314	0.28	0.205	0.226	-39.1	10.2
EN20 Particulates (total from thermal generation - simple and CHP)	g/kWh total net	0.043	0.035	0.029	0.017	0.021	-51.2	23.5
EN16 CO_2 (total from thermal generation - simple and CHP)	g/kWh total net	233	225	183	136	139	-40.3	2.20
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.658	0.696	0.553	0.229	0.616	-6.40	169
EN20 **Specific radioactive emissions into the atmosphere**								
Nuclear generation (CHP)								
Noble gases	kBq/kWh	1.00	1.00	0	1.00	1.00	0	0
Aerosol β and γ	mBq/kWh	2.00	1.00	2.00	1.00	1.00	-50.0	0
Aerosol α	µBq/kWh	2.00	1.00	2.00	0	0	-100	0
Strontium 89 and 90	µBq/kWh	15.0	10.0	7.00	5.00	4.00	-73.3	-20.0
Net specific conventional polluting load of waste waters discharged by plants (CHP)								
COD	mg/kWh	0	0	0	28.0	35.2	0	25.7
BOD	mg/kWh	0	0	0	4.33	6.18	0	42.7

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN21 Net specific conventional polluting load of waste waters discharged by plants (nuclear generation - CHP)								
Metals and compounds (expressed as metal equivalents)	mg/kWh	0.014	0.013	0.012	0.026	0.017	21.4	-34.6
Total nitrogen (expressed as N)	mg/kWh	7.26	3.17	2.53	2.26	2.23	-69.3	-1.30
Total phosphorus (expressed as P)	mg/kWh	0.200	0.182	0.162	0.175	0.182	-9.00	4.00
COD	mg/kWh	9.81	8.30	8.16	9.90	8.97	-8.60	-9.40
BOD	mg/kWh	1.28	1.22	1.29	1.13	1.44	12.5	27.4
EN21 Net specific polluting load of radionuclides in waste waters (nuclear generation - CHP)								
Tritium	kBq/kWh	1.09	0.978	1.58	1.36	1.40	28.4	2.90
Coal and brown-coal ash (thermal generation (CHP))	g/kWh net from coal and brown coal	125	132	153	157	208	66.4	32.5
EN22 Specific production of radioactive waste								
low- and medium-level								
liquid	mm^3/kWh net	10.2	9.24	6.59	5.36	3.78	-62.9	-29.5
solid	mg/kWh net	3.18	3.10	2.32	2.06	2.07	-34.9	0.500
EN22 Low-, intermediate- and high-level radioactive waste stored inside plants	% in volume of production since the start of operation							
liquid		92.0	64.2	57.8	53.6	46.6	-49.3	-13.1
solid		87.9	37.1	32.8	30.8	27.0	-69.3	-12.3
EN22 Waste recovery								
Coal and brown-coal ash	% production	41.0	47.0	52.8	50.9	82.8	102	62.7
bottom ash	*% production*	*0*	*0*	*54.6*	*79.3*	*77.4*	*0*	*-2.40*
flyash	*% production*	*58.4*	*68.4*	*52.1*	*46.3*	*83.8*	*43.5*	*81.0*
Gypsum from desulfurization	% production	60.3	79.4	100	100	43.1	-28.5	-56.9
Other non-hazardous special waste								
electricity generation	% production	0.978	2.37	3.98	6.00	13.1	1,239	118
Total non-hazardous special waste								
electricity generation	% production	22.6	24.6	30.2	31.6	64.7	186	104
Other hazardous special waste								
electricity generation	% production	16.3	36.4	57.4	76.9	65.4	301	-15.0
Total special waste								
electricity generation	% production	22.5	24.6	30.2	31.6	64.7	187	104

Highlights of 2011

Overall electricity generation stood practically steady, with a slight drop of 0.2% on 2010. The decrease of hydro generation (of over 1 TWh, due to lower hydraulicity in 2011 than in 2010) was offset by a corresponding increase in nuclear generation.

In Slovakia, Enel is active (through Slovenské elektrárne) in thermal, nuclear (both CHP) and renewable (hydro) power generation.

EN1 EN2 As regards expendables, the consumption of limestone increased owing to, above all, higher generation from brown coal. The amount of limestone includes the share coming from the paper industry as a by-product (see the "Environmental Management Systems" chapter).
Used oil: some plants carry out an intense activity of treatment of used oils. In the Vojany plant, used oils are treated mechanically and electrostatically. In the Bohunice plant, used dielectric oils are filtered and degasified.

EN22 The higher share of brown coal in the fuel mix also justifies the increase in the production of gypsum in 2011.

EN16 EN20 Net specific emissions of all pollutants increased owing to higher thermal generation from brown coal.

EN18 In 2011, avoided CO_2 emissions exceeded 19 million tonnes (down by as little as 0.5% on the previous year). Overall, the contribution of generation from renewables decreased and was offset by an increase in the contribution of nuclear generation.

EN22 The production of intermediate- and low-level radioactive waste had a declining trend, in line with the reduction program which was started in 2010. Under the program, retrofits of the sewage and drainage systems made it possible to recirculate liquid radioactive waste (containing boric acid) inside the plants and to avoid its discharge.

EN19 Ozone-depleting substances:

R22
Emission: **23 kg, equivalent to 1.3 kg CFC11**. This amount was determined on the basis of gas replenishments in the Mohovce and Nováky plants.

EN23 About 11 l of oil spilled into water from the hydro plant of Miksova. The organization conducted tightness tests of equipment containing hazardous substances with a view to preventing this kind of events. The list of the pieces of equipment involved is reviewed on a yearly basis. Moreover, surfaces are protected and, where possible, use is made of efficient monitoring & control systems, special devices, new technologies and procedures.

EN26 Environmental enhancements.

Water

> The repair of the drinking water supply system saved about 9,000 m^3 of water during 2011.

Materials and resources

> The recycling of sludges containing calcium carbonate and coming from the paper industry saved a considerable amount of natural limestone.

Liquid releases

> At the Vojany plant, installation of flow meters to measure the water discharged into the Laborec river and of a system to monitor hydrocarbon content in water.

> At the Nováky plant, works for the installation of a system of treatment of fuel oil in waste waters were completed in 2011.

Waste

> Waste items of commercial value (metals, ash, gypsum and sludges from water treatment) were sold through electronic auctions.

Renewables

> At the Nováky plant, co-firing of biomass was started.

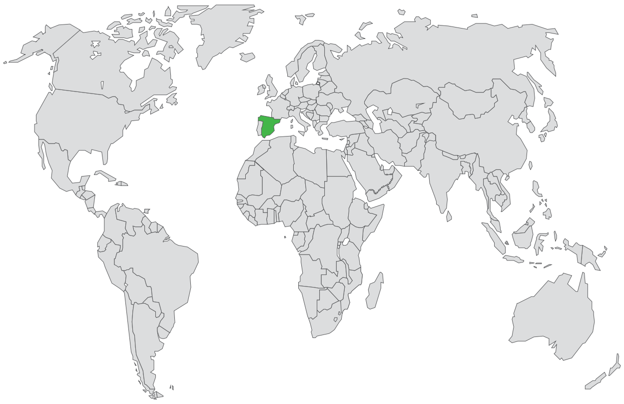
Noise

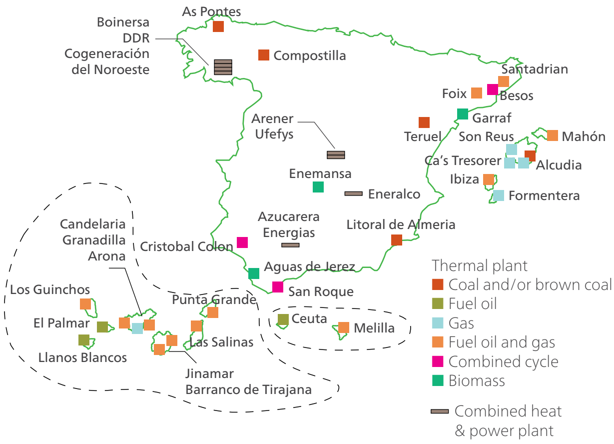
> At the Vojany plant, noise monitoring surveys are carried out to check compliance with noise immission limits.

Spain

Thermal power generation (simple and CHP)

Endesa SA
Enel Green Power SpA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
34	13,393	42,448

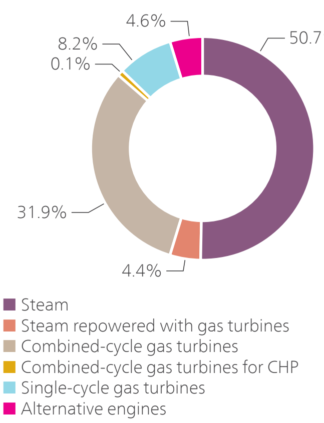
Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW	Useful thermal capacity 10^6 kcal/h
Steam (condensing)	9	32	6,795	-
Steam (back pressure) for CHP	0	1	6	0
Steam repowered with gas turbines	0	8	587	-
Combined-cycle gas turbines	9	22	4,271	-
Combined-cycle gas turbines for CHP	1	1	13	30
Single-cycle gas turbines	4	39	1,101	-
Single-cycle gas turbines for CHP	0	1	3	0
Alternative engines	11	114	618	-
	34	**218**	**13,393**	**30**

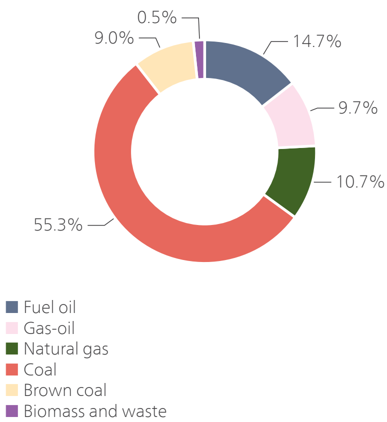
Power plants with a total net maximum capacity of about 11,672 MW are ISO 14001-certified.

Net electricity generation
Total: 42,448 million kWh

Net maximum electrical capacity
Total: 13,393 MW



Fuel consumption
Total: 9,533,219 t of oil-equivalent



Useful heat output (combined with power generation)
Total: 169,192 million kcal equal to 197 million kWh

Waste waters

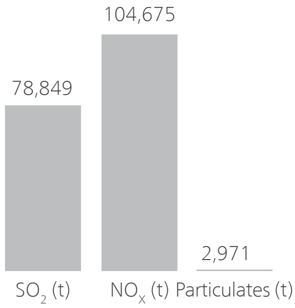
Discharged: **24,228,001 m³**
Used inside plants: **12,140 m³**

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

Avoided CO_2 emissions

Due to generation from biomass and biodegradable fraction of waste: **77,367 t**

Emissions into the atmosphere



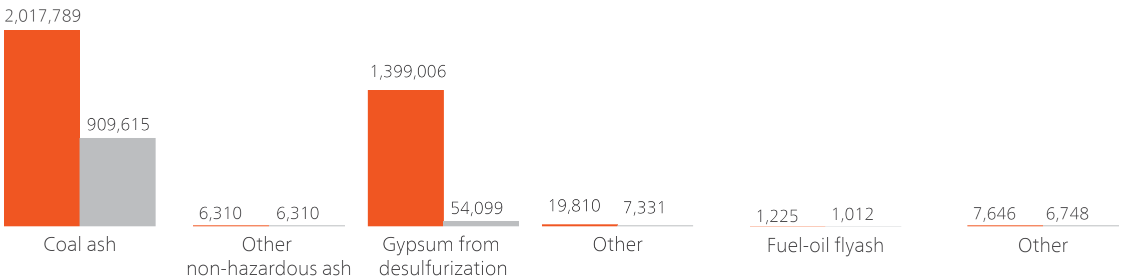
CO_2 (t)	34,539,601
from combustion	*34,300,428*
from desulfurization	*239,173*
SF_6 (kg)	86.59
(t of CO_{2eq})	1,922
Total (t of CO_{2eq})	34,541,523

Special waste

Total production: **3,451,899 t**
Total delivery to recovery operators: **985,115 t**

Non-hazardous
Production: 3,443,019 t
Delivery to recovery operators: 977,355 t

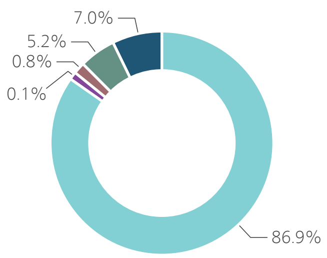
Hazardous
Production: 8,871 t
Delivery to recovery operators: 7,760 t



Production ■ Delivery to recovery operators

Water for industrial uses

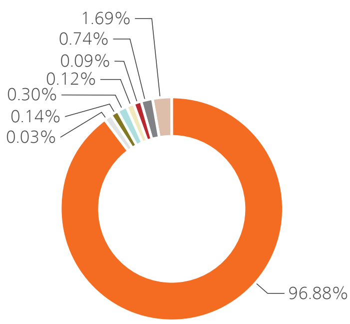
Total requirements: 49,223 m³



- From rivers
- From wells
- From aqueducts
- From the sea (as-is)
- From the sea (desalinated)

Expendables

Total: 713,289 t



- Resins, hydrazine, carbohydrazide & hydrogen peroxide
- Ammonia
- Limestone for flue-gas desulfurization
- Magnesium oxide
- Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate
- Sulfuric & hydrochloric acids
- Caustic soda
- Lime, ferric chloride and polyelectrolyte
- Lubricating oil
- Dielectric oil
- Other

Coal storage & handling

Endesa manages three port terminals in Ferrol, Carboneras and Los Barrios for the storage & handling of coal to be used by its plants of As Pontes (Ferrol) and Almería (Carboneras) and by E.ON's thermal plant of Los Barrios. Coal is usually transferred to the plants by trucks.

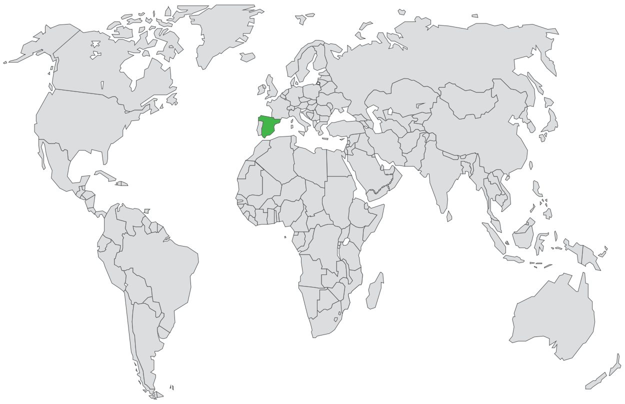
Distance from Ferrol to As Pontes: about **60 km**
Distance from Carboneras to Almería: about **1 km**
Distance from Los Barrios to E.ON's plant: about **3 km**
Total coal transferred to the plants: **6,931,434 t**
Total electricity consumption: **6.6 million kWh**

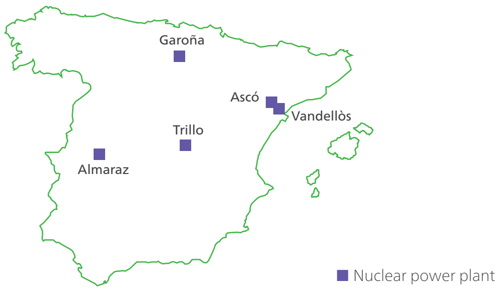
In the following pages, the other flow data (consumption of natural gas and gas oil, expendables, water for industrial uses, waste waters, releases into the atmosphere and into water bodies, waste) are included among the thermal generation data.

Spain

Nuclear power generation

Endesa SA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
5	3,527	25,177

Power installations

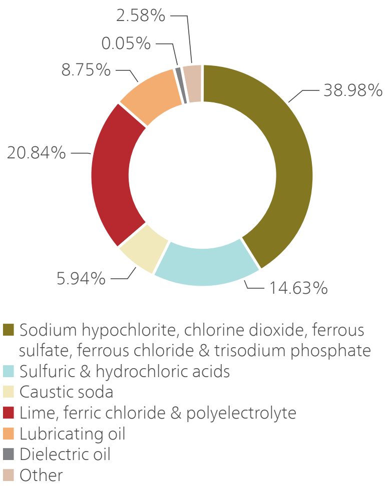
	Power plants no.	Units no.	Net maximum electrical capacity MW
Steam (condensing)	**5**	**7**	**3,527**

All the power plants are ISO 14001-certified.

Net electricity generation
Total: 25,177 million kWh

Water for industrial uses
Total requirements: 1,810,236 m^3
Total abstraction from inland waters: 1,807,244 m^3

Expendables
Total: 1,403 t



Radionuclides in discharged waste waters

Tritium

78,993 GBq

Corrosion and fission products

19 GBq

Waste waters

Discharged: **190,483,738 m^3**
Used inside plants: **2,992 m^3**

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

Avoided CO_2 emissions

Due to nuclear generation: **20,549,399 t**

Radioactive emissions into the atmosphere

Noble gases 41 TBq

Iodine 131 31 MBq

Aerosol β and γ 5,976 MBq

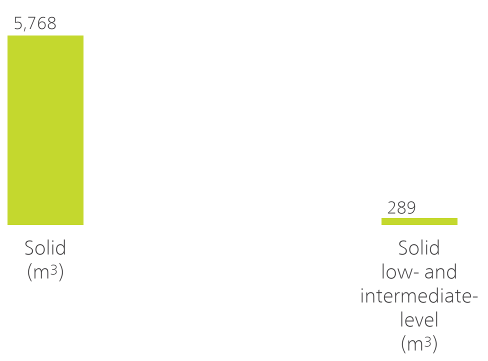
Aerosol α 39 kBq

Strontium 89 and 90 1,838 kBq

Radioactive waste

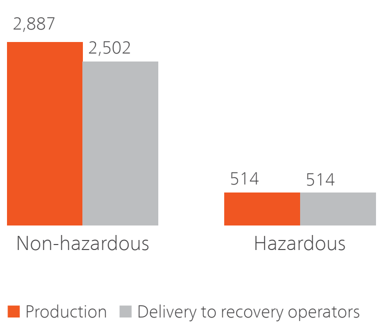
Production since the start of operation

Production in the year



Special waste

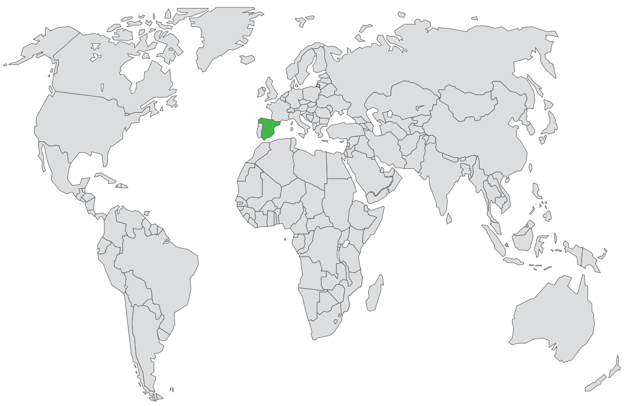
Total production: **3,401 t**
Total delivery to recovery operators:
3,015 t

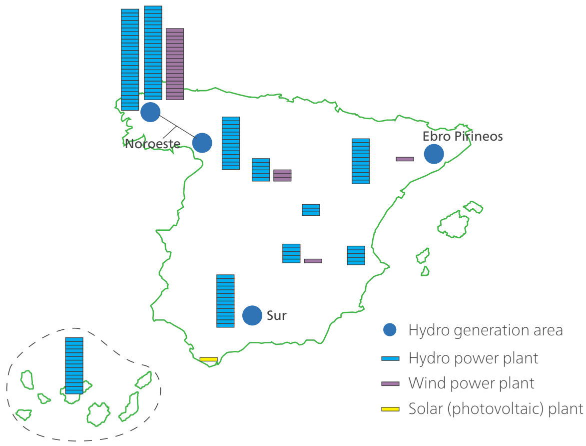


Spain

Electricity generation
from renewables

Endesa SA
Enel Green Power SpA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
162	6,222	9,194

About 4,650 MW of hydro power plants (Endesa + Enel Green Power) and 475 MW of wind power plants (Enel Green Power) are ISO 14001-certified.

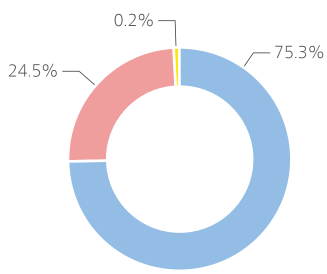
Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	57	90	505
Pondage/reservoir	72	143	2,833
Pure/mixed pumped storage	6	17	1,347
	135	**250**	**4,685**

WIND	Power plants no.	Net maximum electrical capacity MW
	72	**1,524**

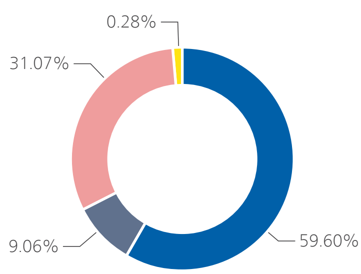
SOLAR PHOTOVOLTAIC	Power plants no.	Net maximum electrical capacity MW
	1	**13**

Net maximum electrical capacity
Total: 6,222 MW



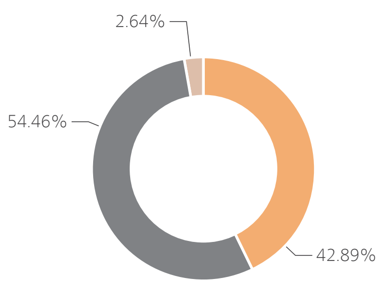
- Hydro
- Wind
- Solar photovoltaic

Net electricity generation
Total: 9,194 million kWh



- Hydro from natural flows
- Hydro from pumped storage
- Wind
- Solar photovoltaic

Expendables
Total: 214 t



- Lubricating oil
- Dielectric oil
- Other

Equivalent yearly hours of utilization*

1,642 hydro

1,897 wind

1,945 solar photovoltaic

* Yearly generation/capacity ratio (excluding hydro from pumped storage).

Avoided CO_2 emissions (t)

Due to hydro generation from natural flows	4,471,858
Due to wind generation	2,331,462
Due to solar photovoltaic generation	20,638
Total	**6,823,958**

Emissions from the otherwise necessary fossil-fired thermal generation.

Emissions into the atmosphere

SF_6 - all technologies (kg)	13
(t of CO_2 equivalent)	293

Total

293 t

of CO_2 equivalent

Gas oil

9 toe

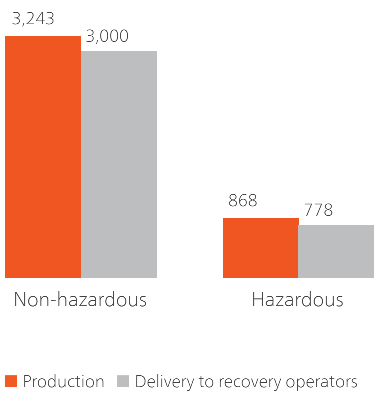
Total consumption

Used for feeding emergency generating sets.

Special waste

Total production: **4,111 t**

Total delivery to recovery operators: **3,779 t**



Other data

Hydro

Emptied reservoirs

Quantity: **1**

Alluvial sediments removed by flushing them out through bottom outlets:
6,818 m³

Fish ladders: **15**

Wind and photovoltaic generation

Wind power plants

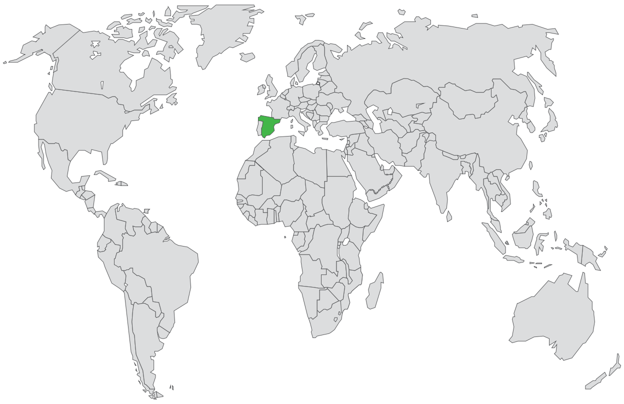
Surface area occupied by platforms, service roads, buildings: **138 ha**

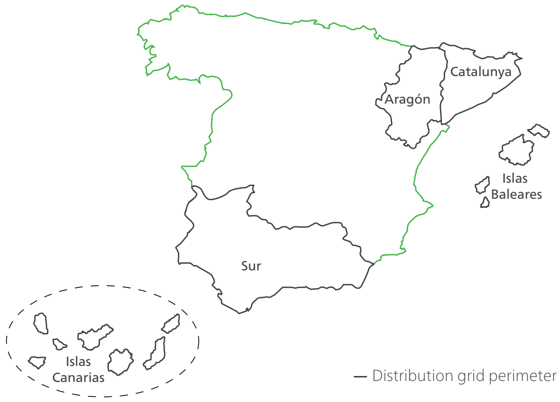
Total surface area affected by the installations: from 20 to 100 times larger

Spain

Electricity distribution

Endesa SA



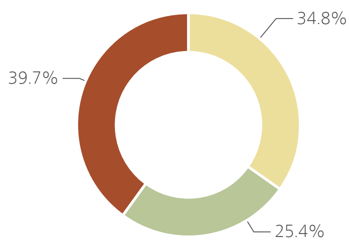


The Numbers

Substations	Capacity (MVA)	Total lines (km)
162,507	151,214	321,462

Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	991	80,297
Satellite substations and MV units	2	23
MV/LV	161,310	68,664
MV/MV	204	2,230
	162,507	**151,214**



LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	18,310	-	712	**19,022**
MV	79,539	0	39,260	**118,799**
LV	14,084	81,837	87,720	**183,641**
	111,933	**81,837**	**127,692**	**321,462**

The organization is ISO 14001-certified.

General data

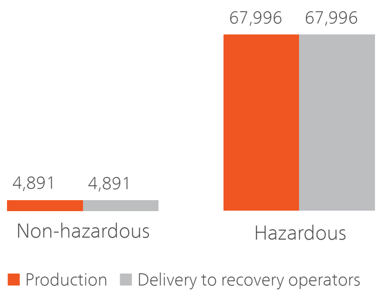
Municipalities served: **3,083**
Surface area served: **196,595 km²**
Customers connected to the grid: **5,351,106** (of which supplied by companies of the Group: **5,288,478**)

Resource consumption

Expendables: **146 t**
Gas oil: **1,056 toe**

Special waste

Total production: **72,887 t**
Total delivery to recovery operators: **72,887 t**



Electricity

Total electricity distributed: **105,106 million kWh**

Emissions into the atmosphere

SF_6: **158 kg (3,510 t of CO_2 equivalent)**

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	**no.**	**361**	**342**	**215**	**247**	**200**
thermal	no.	38	32	32	32	33
nuclear	no.	5	5	5	5	5
hydro	no.	214	204	102	144	135
wind	no.	104	101	75	65	72
solar (photovoltaic)	no.	0	0	1	1	1
Net maximum electrical capacity	**MW**	**17,280**	**15,690**	**21,744**	**23,441**	**23,120**
thermal	MW	9,204	8,040	12,441	13,934	13,372
nuclear	MW	2,441	2,442	3,522	3,514	3,527
hydro	MW	4,390	3,791	4,688	4,700	4,684
wind	MW	1,244	1,417	1,080	1,279	1,524
solar (photovoltaic)	MW	0	0	12.3	13.3	13.4
Combined heat & power installations						
Power plants (thermal)	**no.**	**7**	**8**	**8**	**8**	**1**
Net maximum electrical capacity (thermal)	**MW**	**79.1**	**26**	**26.3**	**26.3**	**21.4**
Useful thermal capacity (thermal)	**million kcal/h**	**40.9**	**13.8**	**13.5**	**2.6**	**30**
Power lines (circuit-length)						
Total	**km**	**233,586**	**204,421**	**313,158**	**317,275**	**321,462**
high-voltage	km	15,400	14,177	21,352	18,880	19,022
medium-voltage	km	84,981	77,091	117,238	118,668	118,799
low-voltage	km	133,205	113,154	174,568	179,727	183,641
Gas pipelines (1)						
Total	**km**			**3,440**	**-**	**-**
high-pressure	km			1,007	-	-
medium-pressure	km			1,596	-	-
low-pressure	km			837	-	-
Mining & extracting activities (2)						
Mining activities						
Mines	no.		5	5	5	4
coal	no.		5	5	4	3
other	no.		0	0	1	1
Amount of fuels extractable since the start of activities	Mt		0	0	339	342
Areas occupied by excavations and other activities	ha		2,714	5,341	4,438	4,500
coal mines	ha		2,714	5,341	4,438	3,756
brown-coal mines	ha		0	0	0	744
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.			1,229	1,375	1,712
special vehicles	no.			10	65	140
vehicles for both private and service use	no.			152	0	579
Gross real-estate surface area	thousand m^2			281	1,093	217

(1) These activities have been surveyed since 2009.
(2) These activities have been surveyed since 2008.
-: no data due to absence of activities in the year.

Resources

		2007	2008	2009	2010	**2011**
EN1 EN3 **Fossil fuels**						
Thermal generation						
fuel oil	thousand t	297	1,133	1,660	1,620	1,480
	thousand toe	278	1,111	1,627	1,572	1,405
LS	*thousand t*	*295*	*1,127*	*1,660*	*1,610*	*1,473*
	thousand toe	*276*	*1,109*	*1,626*	*1,563*	*1,399*
VLS	*thousand t*	*1.81*	*6.37*	*0.242*	*9.47*	*6.38*
	thousand toe	*1.35*	*1.44*	*0.236*	*9.39*	*6.20*
gas oil	thousand t	256	751	1,063	1,020	909
	thousand toe	198	766	1,079	1,060	926
natural gas	million m^3	264	1,228	1,229	753	1,071
	thousand toe	244	1,130	1,097	697	997
technologically captive use	*million m^3*	*240*	*1,133*	*1,143*	*725*	*1,061*
	thousand toe	*222*	*1,042*	*1,017*	*671*	*987*
of which in combined-cycle units	million m^3	240	1,133	1,143	725	1,061
	thousand toe	222	1,042	1,017	671	987
non-technologically captive use	*million m^3*	*23.5*	*95.4*	*86.3*	*28.3*	*10.5*
	thousand toe	*21.8*	*88.6*	*80.2*	*26.2*	*9.59*
coal	thousand t	4,985	7,210	7,830	5,647	9,955
	thousand toe	2,346	3,787	4,245	3,036	5,270
brown coal	thousand t	577	1,413	1,213	780	2,698
	thousand toe	148	434	370	247	856
Total	thousand toe	3,213	7,228	8,416	6,612	9,455
	TJ	134,525	302,635	352,363	276,845	395,861
Thermal generation (CHP)						
fuel oil (LS)	thousand t	50.5	17.9	19.3	0	0
	thousand toe	47.5	18.6	20.3	0	0
natural gas	million m^3	48.0	10.7	6.19	26.3	33.1
	thousand toe	44.4	9.99	9.90	24.1	26.9
technologically captive use	*million m^3*	*21.4*	*0*	*0*	*0*	*33.1*
	thousand toe	*19.7*	*0*	*0*	*0*	*26.9*
of which in combined-cycle units	million m^3	0	0	0	0	29.0
	thousand toe	0	0	0	0	26.6
non-technologically captive use	*million m^3*	*26.6*	*10.7*	*6.19*	*26.3*	*0*
	thousand toe	*24.7*	*9.99*	*9.90*	*24.1*	*0*
Total	thousand toe	92	28.6	30.2	24.1	26.9
	TJ	3,851	1,198	1,264	1,009	1,127
Various activities	thousand toe	0.681	17.2	24.8	11.4	11.1
Grand total	**thousand toe**	**3,306**	**7,274**	**8,471**	**6,648**	**9,493**
	TJ	**138,405**	**304,554**	**354,664**	**278,333**	**397,453**
EN1 EN3 **Biomass and waste**						
Thermal generation						
solid biomass	t	0	0	69,774	66,260	91,240
	toe	0	0	26,733	25,386	36,208
	TJ	0	0	1,119	1,063	1,516
biogas	thousand m^3	0	0	33,104	37,442	38,266
	toe	0	0	13,197	14,846	15,134
	TJ	0	0	553	622	634
Total	thousand toe	0	0	39.9	40.2	51.3
	TJ	0	0	1,672	1,684	2,150
EN1 EN3 **Nuclear fuel**						
Nuclear generation						
Uranium	t	16.2	25.6	79.7	36.4	90.4
	thousand toe	0	0	6,191	6,040	6,857
	TJ	0	0	259,215	252,883	287,069
Total	thousand toe	0	0	6,191	6,040	6,857
	TJ	0	0	259,215	252,883	287,069

		2007	2008	2009	2010	2011
EN4 Primary electricity						
Various activities	million kWh	0	0	20.4	51.5	54.4
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	12.5	31.1	32.8	20.6	44.8
From wells	million m^3	2.45	1.20	1.84	2.82	1.96
From aqueducts	million m^3	0.355	0.158	1.12	0.493	0.414
Total abstraction from inland waters	**million m^3**	**15.3**	**32.5**	**35.8**	**23.9**	**47.2**
From the sea (as-is)	million m^3	0.126	3.02	2.73	2.62	2.56
From the sea (desalinated)	million m^3	0.072	1.39	2.55	2.87	3.43
EN10 From waste waters (used inside plants)	million m^3	0	0.005	0.008	0.028	0.015
Total requirements	**million m^3**	**15.5**	**36.9**	**41.1**	**29.4**	**53.2**
for thermal generation	million m^3	15.4	33.7	36.5	25.1	49.2
for nuclear generation	million m^3	0.164	0.929	1.47	1.40	1.81
for fuel storage & handling	million m^3	0	0	0.026	0.029	0.028
for mining & extracting activities (1)	million m^3	0	2.22	3.09	2.92	2.11
EN8 EN21 Open-cycle cooling water						
For thermal generation (simple and CHP)	million m^3	842	2,518	3,574	3,405	3,356
For nuclear generation	million m^3	433	1,827	2,435	2,988	2,417
Total	**million m^3**	**1,275**	**4,345**	**6,009**	**6,392**	**5,773**
Water for non-industrial uses						
Real-estate & service management (2)	million m^3	0	0	2.74	0.046	0.204
EN1 Expendables						
Resins	t	0.119	11.9	18.9	22.3	28.0
Hydrazine	t	18.3	21.2	43.7	19.5	20.1
Carbohydrazide	t	0	6.98	36.2	12.8	3.90
Hydrogen peroxide	t	0	0.136	0.198	0.537	0.971
Ammonia	t	0.600	31.3	47.4	67.7	85.1
Limestone for flue-gas desulfurization	t	0	398,825	354,569	197,218	691,037
Magnesium oxide	t	0	136	318	279	235
Sodium hypochlorite	t	558	2,731	858	830	1,541
Ferrous sulfate	t	0	0	0	0.100	0
Trisodium phosphate	t	1.10	8.48	6.09	6.96	10.0
Lime	t	235	4,258	6,202	445	500
Ferric chloride	t	0	172	240	294	411
Polyelectrolyte	t	0.200	17.9	18.0	8.85	13.7
Sulfuric & hydrochloric acids	t	1,228	1,752	2,035	1,156	2,334
Caustic soda	t	291	706	995	629	966
Lubricating oil	t	44.4	3,429	3,288	5,398	5,556
Dielectric oil	t	36.4	294	164	321	286
Printing paper	t	0	0	17.6	14.9	59.9
Other	t	487	4,413	5,670	17,560	14,589
Total	**t**	**2,900**	**416,815**	**374,527**	**224,284**	**717,677**
for thermal generation	t	2,830	410,607	367,401	219,315	713,104
for thermal generation (CHP)	t	0	0	30.0	15.3	0
for nuclear generation	t	0	2,433	1,047	1,108	1,403
for hydro generation	t	28.9	56.2	98.6	158	200
for wind generation	t	15.9	60.1	52.1	19.6	14.0
for fuel storage & handling	t	0	0	711	169	186
for electricity distribution	t	25.4	159	103	201	146
EN1 PCB survey (3)						
Equipment & transformers with PCBs > 500 ppm (excluding their oil)	t			997	46.0	1.33
Oil with PCBs > 500 ppm contained in equipment & transformers	t			309	4.92	0.34
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t			6,100	7,447	6,645
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t			1,307	2,791	2,062

-: no data due to absence of activities in the year.
(1) These activities have been surveyed since 2008.
(2) These activities have been surveyed since 2009.
(3) The survey began in 2009.

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels	million kWh	14,033	33,381	37,446	29,182	42,251
simple	million kWh	13,615	33,245	37,347	29,007	42,135
fuel oil & gas oil	*million kWh*	*1,945*	*8,191*	*11,291*	*11,597*	*11,143*
natural gas	*million kWh*	*1,425*	*7,053*	*6,569*	*3,904*	*4,945*
of which in combined-cycle units	million kWh	1,353	6,728	6,292	3,815	4,446
coal	*million kWh*	*10,036*	*16,221*	*17,704*	*12,523*	*22,484*
brown coal	*million kWh*	*209*	*1,780*	*1,783*	*983*	*3,563*
combined with heat generation	million kWh	418	136	98.9	175	117
fuel oil & gas oil	*million kWh*	*226*	*84.6*	*72.8*	*0*	*0*
natural gas	*million kWh*	*192*	*51.5*	*26.1*	*175*	*117*
From renewables	million kWh	2,830	7,137	10,268	10,520	8,455
biomass and biodegradable fraction of waste (simple)	million kWh	0	0	127	84.8	94.6
hydro from natural flows	million kWh	1,713	4,858	7,995	8,212	5,479
wind	million kWh	1,118	2,279	2,123	2,202	2,857
solar (photovoltaic)	million kWh	0	0	21.9	21.1	25.3
Hydro from pumped storage	million kWh	801	615	998	1,162	833
Nuclear (simple)	million kWh	4,132	17,508	22,630	27,620	25,177
Total	million kWh	21,797	58,641	71,341	68,483	76,716
simple	million kWh	21,379	58,505	71,242	68,308	76,600
combined with heat generation	million kWh	418	136	98.9	175	117
Electricity consumption for pumping	million kWh	1,144	765	1,409	1,592	1,295
Available generation	million kWh	20,653	57,876	69,932	66,891	75,421
Useful heat output (combined with power generation)						
In thermal power plants (fossil fuels)	million kcal	193,510	78,577	77,442	9,124	169,192
	million kWh	225	91.4	90.1	10.6	197
Electricity distribution						
Electricity distributed	million kWh	24,398	80,144	104,938	103,943	105,105
EN4 Electricity consumption for grid operation	million kWh	24.5	0	14.6	0	0.818
Natural gas distribution (1)						
Natural gas distributed	million m^3	-	na	442	na	0
Mining & extracting activities (2)						
Mining activities						
Fuel extracted in the year	million t	na	1.38	1.90	1.84	1.01
Areas restored in the year (geomorphology, hydrogeology and landscape)						
Areas revegetated with plant, shrub and tree species	ha	na	69.9	23.1	0	283
Areas occupied by water bodies	ha	na	157	234	0	74.0
Areas restored since the start of activities (geomorphology, hydrogeology and landscape)						
Areas revegetated with plant, shrub and tree species	ha	na	1,532	2,287	2,063	2,502
Areas of high landscape-cultural value	ha	na	88.7	132	132	139
Areas occupied by water bodies	ha	na	198	509	509	892
Areas occupied by infrastructure (roads, canals, aqueducts, power lines)	ha	na	65.7	97.9	90.1	93.0
Areas awaiting final restoration	ha	na	168	271	207	121

(1) These activities have been surveyed since 2008.
(2) These activities have been surveyed since 2009.
na: not available

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	126	66.4	64.2	45.3	78.8
EN20 NO_X	thermal generation	thousand t	47.0	95.4	111	76.8	105
EN20 Particulates	thermal generation	thousand t	6.31	3.05	3.02	1.74	2.97
EN16 CO_2	*fossil-fired thermal generation (from combustion)*	*thousand t*	*12,112*	*26,631*	*29,778*	*23,141*	*34,228*
	fossil-fired thermal generation (from desulfurization)	*thousand t*	*0*	*305*	*125*	*69.5*	*239*
	Total from fossil-fired thermal generation	thousand t	12,112	26,936	29,903	23,210	34,467
	non-fossil-fired thermal generation (from fossil carbon)	thousand t	0.263	0	0	0	0
	Total from thermal generation	thousand t	12,112	26,936	29,903	23,210	34,467
	Fossil-fired thermal generation (CHP) (from combustion)	thousand t	264	79.8	85.7	29.0	72.4
	Various activities	thousand t	2.00	55.2	74.7	51.8	26.3
	Total	**thousand t**	**12,378**	**27,071**	**30,063**	**23,291**	**34,566**
EN16 SF_6	electricity generation	kg	40.0	432	47.7	111	99.8
		thousand t of CO_2 equivalent	0.912	9.84	1.09	2.52	2.28
	electricity distribution	kg	26.0	228	196	139	158
		thousand t of CO_2 equivalent	0.593	5.2	4.48	3.16	3.61
	Total	**kg**	**66.0**	**660**	**244**	**249**	**258**
		thousand t of CO_2 equivalent	**1.51**	**15.0**	**5.57**	**5.69**	**5.88**
EN16 CH_4	gas distribution, mining & extracting activities	thousand t	0	1.14	1.57	1.52	0.837
		thousand t of CO_2 equivalent	0	28.6	39.3	38.0	20.9
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**12,379**	**27,114**	**30,108**	**23,335**	**34,593**
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	1,523	3,936	6,380	6,552	4,472
Due to wind and solar (photovoltaic) generation		thousand t	995	1,846	1,712	1,773	2,352
Due to generation from biomass & biodegradable fraction of waste		thousand t	0	0	102	67.6	77.2
Total from renewables		**thousand t**	**2,518**	**5,782**	**8,193**	**8,393**	**6,901**
Due to nuclear generation		thousand t	3,676	14,185	18,058	22,035	20,549
Total		**thousand t**	**6,194**	**19,967**	**26,251**	**30,428**	**27,451**

	Source		2007	2008	2009	2010	2011
EN20 Radioactive emissions into the atmosphere	nuclear generation						
Noble gases		TBq	3.1	24.4	24.0	15.2	40.7
Iodine 131		MBq	2.93	158	258	88.8	31.3
Aerosol β and γ		MBq	1.87	20,132	18,401	6,567	5,976
Aerosol α		kBq	4.88	35.9	63.7	31.4	39.2
Strontium 89 and 90		kBq	681	2,781	8,482	2,896	1,838
EN21 Waste waters (discharged quantity)	*thermal generation*	*million m^3*	*1.01*	*22.7*	*28.8*	*23.0*	*24.2*
	nuclear generation	*million m^3*	*21.7*	*96.1*	*158*	*158*	*190*
	Total electricity generation	million m^3	22.7	119	187	181	215
	Fuel storage & handling	million m^3	0	0	0	0.013	0.027
	Total	**million m^3**	**22.7**	**119**	**187**	**181**	**215**
EN21 Conventional polluting load in waste waters discharged by plants							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	11,575	0	58,684	68,367	2,823
	in some plants with an overall capacity of	MW	8,758	0	4,622	4,344	5,118
	nuclear generation	kg	111	49.7	70.3	104	15.2
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	Total electricity generation	kg	11,686	49.7	58,754	68,471	2,838
	Fuel storage & handling	kg	0	0	0	0	11.1
	Total	**kg**	**11,686**	**49.7**	**58,754**	**68,471**	**2,849**
Total nitrogen (expressed as N)	thermal generation	kg	28,647	10,204	221,409	284,571	38,248
	in some plants with an overall capacity of	MW	8,698	2,622	1,588	5,265	4,574
	nuclear generation	kg	2,213	7,407	17,612	5,888	10,664
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	Total electricity generation	kg	30,860	17,611	239,021	290,459	48,912
	Fuel storage & handling	kg	0	0	0	0	31.3
	Total	**kg**	**30,860**	**17,611**	**239,021**	**290,459**	**48,943**
Total phosphorus (expressed as P)	thermal generation	kg	9,934	119	10,028	19,028	10,008
	in some plants with an overall capacity of	MW	8,698	2,064	488	3,593	5,815
	nuclear generation	kg	76.6	99.4	118	1,189	1,152
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	Total electricity generation	kg	10,011	218	10,146	20,217	11,160
	Fuel storage & handling	kg	0	0	0	0	19.7
	Total	**kg**	**10,011**	**218**	**10,146**	**20,217**	**11,179**
COD	thermal generation	kg	6,153	26,083	77,778	16,365	7,061
	in some plants with an overall capacity of	MW	290	3,466	2,705	4,094	1,792
	nuclear generation	kg	1,734	2,064	2,714	24,125	29,400
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	Total electricity generation	kg	7,887	28,147	80,492	40,491	36,461
	Fuel storage & handling	kg	0	0	265	0	7,376
	Total	**kg**	**7,887**	**28,147**	**80,757**	**40,491**	**43,837**
BOD	thermal generation	kg	1,107	1,882	4,912	2,783	750,856

	Source		2007	2008	2009	2010	2011
	in some plants with an overall capacity of	MW	144	759	1,096	2,076	1,646
	nuclear generation	kg	297	1,376	1,792	4,623	7,986
	on an overall capacity of	MW	2,441	2,442	3,522	3,514	3,527
	Total electricity generation	kg	1,404	3,258	6,704	7,406	758,842
	Fuel storage & handling	kg	0	0	114	0	2,482
	Total	**kg**	**1,404**	**3,258**	**6,818**	**7,406**	**761,324**
EN21 Radionuclides in waste waters discharged by plants	nuclear generation						
Tritium		GBq	9,028	58,777	57,746	71,013	78,993
Corrosion and fission products		GBq	3.08	12.8	21.7	9.82	19.0
EN22 Non-hazardous special waste							
Coal bottom ash	fossil-fired thermal generation (simple and CHP)						
production		t	217,529	208,742	133,769	77,428	243,908
delivery to recovery operators		t	58,423	59,697	8,556	7,376	100,688
Coal flyash	fossil-fired thermal generation (simple and CHP)						
production		t	1,116,985	1,177,396	1,050,321	601,802	1,773,881
delivery to recovery operators		t	1,064,305	1,080,210	860,169	438,567	808,927
Oil bottom ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	0	1.84	0
delivery to recovery operators		t	0	0	0	1.84	0
Other non-hazardous ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	3,508	6,352	6,310
Gypsum from desulfurization	fossil-fired thermal generation (simple and CHP)						
production		t	134,358	749,817	727,750	436,838	1,399,006
delivery to recovery operators		t	180	879	9,549	36,661	54,099
Other							
production	electricity generation	t	56,698	34,568	203,426	19,457	25,940
	electricity distribution	t	7,058	98,615	115,842	79,110	67,996
	various activities	t	0	292	1,619	1,059	363
	Total	**t**	**63,757**	**133,476**	**320,887**	**99,626**	**94,299**
delivery to recovery operators	electricity generation	t	4,412	3,470	2,062	18,554	12,833
	electricity distribution	t	288	5,100	7,355	21,613	67,996
	various activities	t	0	279	1,360	878	363
	Total	**t**	**4,700**	**8,849**	**10,777**	**41,045**	**81,192**
Total							
production	**electricity generation**	**t**	**1,525,570**	**2,170,523**	**2,118,774**	**1,141,878**	**3,449,045**
	electricity distribution	**t**	**7,058**	**98,615**	**115,842**	**79,110**	**67,996**
	various activities	**t**	**0**	**292**	**1,619**	**1,059**	**363**
	Total	**t**	**1,532,628**	**2,269,431**	**2,236,235**	**1,222,047**	**3,517,403**
delivery to recovery operators	**electricity generation**	**t**	**1,127,319**	**1,144,256**	**880,335**	**501,160**	**982,856**
	electricity distribution	**t**	**288**	**5,100**	**7,355**	**21,613**	**67,996**
	various activities	**t**	**0**	**279**	**1,360**	**878**	**363**
	Total	**t**	**1,127,607**	**1,149,635**	**889,051**	**523,651**	**1,051,215**

-: no data due to absence of activities in the year.

	Source		2007	2008	2009	2010	**2011**
EN22 **Hazardous special waste**							
Oil flyash	fossil-fired thermal generation (simple and CHP)						
production		t	103	535	753	909	1,225
delivery to recovery operators		t	0	0	753	909	1,012
Other ash	fossil-fired thermal generation (simple and CHP)						
production		t	0	0	0.190	0.300	0.600
delivery to recovery operators		t	0	0	0.190	0	0
Other							
production	electricity generation	t	2,172	5,976	9,124	6,164	9,027
	electricity distribution	t	1,426	18,414	4,865	5,593	4,891
	various activities	t	0	142	317	110	136
	Total	**t**	**3,599**	**24,532**	**14,306**	**11,867**	**14,054**
of which with PCBs	*electricity generation*	*t*	*579*	*1,413*	*1,976*	*2,661*	*2,878*
	electricity distribution	*t*	*137*	*646*	*348*	*301*	*956*
	various activities	*t*	*0*	*0*	*2.20*	*1.07*	*2.74*
	Total	*t*	*717*	*2,059*	*2,326*	*2,962*	*3,837*
delivery to recovery operators	electricity generation	t	348	1,920	2,776	6,026	8,040
	electricity distribution	t	423	5,212	4,382	5,331	4,891
	various activities	t	0	85.7	310	13.5	124
	Total	**t**	**771**	**7,218**	**7,469**	**11,371**	**13,054**
of which with PCBs	*electricity generation*	*t*	*85.7*	*1,412*	*1,962*	*2,545*	*2,875*
	electricity distribution	*t*	*0*	*641*	*348*	*282*	*956*
	various activities	*t*	*0*	*0*	*0*	*0.574*	*2.74*
	Total	*t*	*85.7*	*2,052*	*2,310*	*2,827*	*3,834*
Total							
production	electricity generation	t	2,275	6,511	9,878	7,073	10,253
	electricity distribution	t	1,426	18,414	4,865	5,593	4,891
	various activities	t	0	142	317	110	136
	Total	t	3,701	25,067	15,060	12,776	15,280
delivery to recovery operators	electricity generation	t	348	1,920	3,530	6,935	9,052
	electricity distribution	t	423	5,212	4,382	5,331	4,891
	various activities	t	0	85.7	310	13.5	124
	Total	t	771	7,218	8,223	12,279	14,066
EN22 **Total special waste**							
production	electricity generation	t	1,527,845	2,177,034	2,128,652	1,148,951	3,459,298
	electricity distribution	t	8,485	117,029	120,707	84,704	72,887
	various activities	t	0	434	1,936	1,169	499
	Total	t	1,536,330	2,294,497	2,251,295	1,234,823	3,532,683
delivery to recovery operators	electricity generation	t	1,127,667	1,146,176	883,866	508,095	991,908
	electricity distribution	t	711	10,312	11,738	26,944	72,887
	various activities	t	0	364	1,670	892	487
	Total	t	1,128,378	1,156,853	897,273	535,930	1,065,281

	Source		2007	2008	2009	2010	2011
EN22 **Radioactive waste**							
Low- and intermediate-level:	nuclear generation (simple and CHP) production						
liquid		m^3	3.50	1.25	0	0	0
solid		m^3	39.3	127	220	238	289
of which fraction not storable in off-site surface or subsurface sites		*m^3*	*0*	*72.5*	*0*	*33.4*	*32.3*
solid		t	43.3	0	0	0	0
of which fraction not storable in off-site surface or subsurface sites		*t*	*12.8*	*0*	*0*	*0*	*0*

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	71.3	24.2	21.7	38.1	44.6	-37.4	17.1
underground	% of entire LV grid	27.3	45.2	46.2	47.3	47.8	75.1	1.10
Total	**% of entire LV grid**	**98.6**	**69.3**	**67.9**	**85.4**	**92.3**	**-6.40**	**8.10**
MV cable lines								
overhead	% of entire MV grid	1.02	1.13	1.11	1.11	0	-100	-100
underground	% of entire MV grid	27.5	30.6	31.6	32.4	33.0	20.0	1.90
Total	**% of entire MV grid**	**28.5**	**31.7**	**32.7**	**33.6**	**33.0**	**15.8**	**-1.80**
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	66.8	50.7	50.4	61.1	65.2	-2.40	6.70
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	2,360	2,174	2,253	2,280	2,244	-4.90	-1.60
EN1 EN3 Net heat rate of thermal generation (CHP)	kcal/kWh	1,430	1,258	1,598	1,298	859	-39.9	-33.8
EN1 EN3 Net efficiency of hydro generation from pumped storage	%	70.0	80.4	70.8	73.0	64.3	-8.10	-11.9
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.101	0	0.014	0	0.001	-99.0	0
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	1.13	1.01	0.974	0.861	1.17	3.50	35.9
excluding contribution of as-is sea water	liters/kWh	1.12	0.924	0.901	0.771	1.11	-0.900	44.0
EN8 Net specific requirements of water for industrial uses in nuclear generation	liters/kWh	0.04	0.053	0.065	0.051	0.072	80.0	41.2
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	80.7	86.7	83.3	77.2	87.4	8.30	13.2
from wells	% of requirements	15.8	0.069	0.176	0.204	0.116	-99.3	-43.1
from aqueducts	% of requirements	2.29	0.456	2.58	1.78	0.77	-66.4	-56.7
Total from inland waters	**% of requirements**	**98.7**	**87.3**	**86.1**	**79.1**	**88.3**	**-10.5**	**11.6**
from the sea (as-is)	% of requirements	0.812	8.71	7.18	9.9	5.01	517	-49.4
from the sea (desalinated)	% of requirements	0.464	4.01	6.7	10.9	6.71	1,346	-38.4
EN10 from waste waters (used inside plants)	% of requirements	0	0.014	0.021	0.106	0.029	0	-72.6
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	9.84	15.6	19.5	23.7	14.8	50.4	-37.6
gas oil	% of total fuel consumption	5.99	10.6	12.8	16	9.77	63.1	-38.9
natural gas	% of total fuel consumption	8.72	15.7	13.1	10.9	10.8	23.9	-0.900
coal	% of total fuel consumption	71.0	52.2	50.3	45.7	55.6	-21.7	21.7
brown coal	% of total fuel consumption	4.47	5.97	4.38	3.73	9.03	102	142
LS fuel oil	% of total fuel oil consumption	99.6	99.9	100	99.4	99.6	0	0.200
VLS fuel oil	% of total fuel oil consumption	0.415	0.127	0.014	0.597	0.441	6.30	-26.1
natural gas, technologically captive use	% of total natural gas consumption	83.8	91.4	91.9	93.0	99.1	18.3	
of which in combined-cycle units	*% of total natural gas consumption*	*77.0*	*91.4*	*91.9*	*93.0*	*99.0*	*28.6*	*6.50*
natural gas, non-technologically captive use	% of total natural gas consumption	16.2	8.65	8.14	6.97	0.937	-94.2	-86.6

-: no data due to absence of activities in the year.

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
thermal from biomass & biodegradable fraction of waste	% of total generation	0	0	0.179	0.124	0.123	0	-0.800
hydro from natural flows	% of total generation	7.86	8.28	11.2	12	7.14	-9.20	-40.5
wind and solar (photovoltaic)	% of total generation	5.13	3.89	3.01	3.25	3.76	-26.7	15.7
Total	**% of total generation**	**13.0**	**12.2**	**14.4**	**15.4**	**11.0**	**-15.4**	**-28.6**
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	9.29	2.00	1.71	1.56	1.87	-79.9	19.9
EN20 NO_X (thermal generation)	g/kWh thermal net	3.45	2.87	2.97	2.64	2.48	-28.1	-6.1
EN20 Particulates (thermal generation)	g/kWh thermal net	0.463	0.092	0.081	0.060	0.070	-84.9	16.7
EN16 CO_2 (thermal generation)	g/kWh thermal net	890	810	798	798	816	-8.30	2.30
EN16 CO_2 (thermal generation - CHP)	g/kWh thermal net	410	351	453	156	231	-43.7	48.1
EN20 SO_2 (total from thermal generation - simple and CHP)	g/kWh total net	5.74	1.13	0.899	0.661	1.03	-82.1	55.8
EN20 NO_X (total from thermal generation - simple and CHP)	g/kWh total net	2.13	1.62	1.56	1.12	1.36	-36.2	21.4
EN20 Particulates (total from thermal generation - simple and CHP)	g/kWh total net	0.286	0.052	0.042	0.025	0.039	-86.4	56.0
EN16 CO_2 (total from thermal generation - simple and CHP)	g/kWh total net	562	460	420	339	449	-20.1	32.4
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.419	0.201	0.051	0.271	0.144	-65.6	-46.9
EN20 **Specific radioactive emissions into the atmosphere**								
Nuclear generation								
Noble gases	kBq/kWh	1.00	1.00	1.00	1.00	2.00	100	100
Iodine 131	kBq/kWh	1.00	9.00	11.00	3.00	1.00	0	-66.7
Aerosol β and γ	mBq/kWh	0	1,150	813	238	237	0	-0.400
Aerosol α	µBq/kWh	1.00	2.00	3.00	1.00	2.00	100	100
Strontium 89 and 90	µBq/kWh	165	159	375	105	73.0	-55.8	-30.5
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	6.19	0.151	0	-97.6
Total nitrogen (expressed as N)	mg/kWh thermal net	0	0	0	26.3	2.63	0	-90.0
Total phosphorus (expressed as P)	mg/kWh thermal net	0	0	0	1.80	0.454	0	-74.8
COD	mg/kWh	0	0	0	2.20	2.14	0	-2.70
BOD	mg/kWh	0	0	0	1.09	207	0	18,890
EN21 **Net specific conventional polluting load of waste waters discharged by plants (nuclear generation - CHP)**								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0.027	0.003	0.003	0.004	0.001	-96.3	-75.0
Total nitrogen (expressed as N)	mg/kWh thermal net	0.536	0.423	0.778	0.213	0.424	-20.9	99.1
Total phosphorus (expressed as P)	mg/kWh thermal net	0.019	0.006	0.005	0.043	0.046	142	7.00
COD	mg/kWh	0.42	0.118	0.12	0.873	1.17	178	34.0
BOD	mg/kWh	0.072	0.079	0.079	0.167	0.317	340	89.8
EN21 **Net specific polluting load of radionuclides in waste waters discharged by plants (nuclear generation)**								
Tritium	kBq/kWh	2.19	3.36	2.55	2.57	3.14	43.4	22.2
EN22 **Specific waste production**								
Coal and brown-coal ash (thermal generation)	g/kWh net from coal and brown coal	130	77.0	60.8	50.3	77.5	-40.4	54.1
Oil flyash (thermal generation)	g/kWh net from fuel oil & gas oil	0.053	0.065	0.067	0.078	0.110	107	41.0
Oil bottom ash (thermal generation)	g/kWh net from fuel oil & gas oil	0.053	0.065	0.067	0.079	0.110	107	39.2

-: no data due to absence of activities in the year.

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 **Specific production of radioactive waste**								
low- and intermediate-level								
liquid	mm^3/kWh net	0.847	0.072	0.146	0.144	0.069	-91.9	-52.1
solid	mg/kWh net	10.5	0	0	0	0	-100	0
	mm^3/kWh	9.51	7.24	9.65	8.74	11.9	25.1	36.2
EN22 **Low-, intermediate- and high-level radioactive waste stored inside plants**	% in volume of production since the start of operation							
liquid		0	78.7	89.7	57.1	54.9	0	-3.90
solid		0	21.5	69.9	27.1	25.1	0	-7.40
EN22 **Waste recovery**								
Coal and brown-coal ash	% production	84.1	82.2	73.4	65.7	45.1	-46.4	-31.4
bottom ash	*% production*	*26.9*	*28.6*	*6.4*	*9.53*	*41.3*	*53.5*	*333*
flyash	*% production*	*95.3*	*91.7*	*81.9*	*72.9*	*45.6*	*-52.2*	*-37.4*
Gypsum from desulfurization	% production	0.134	0.117	1.31	8.39	3.87	2,788	-53.9
Other non-hazardous special waste								
electricity generation	% production	7.78	10.0	0.996	71.9	59.4	663	-17.4
electricity distribution	% production	4.08	5.17	6.35	27.3	100	2,351	266
fuel storage & handling, gas distribution	% production	0	0	0	67.1	100	0	49.0
Total	**% production**	**7.37**	**6.44**	**2.92**	**38.3**	**86.9**	**1,079**	**126**
Total non-hazardous special waste								
electricity generation	% production	73.9	52.7	41.5	43.9	28.5	-61.4	-35.1
electricity distribution	% production	4.08	5.17	6.35	27.3	100	2,351	266
fuel storage & handling, gas distribution	% production	0	0	0	67.1	100	0	49.0
Total	**% production**	**73.6**	**50.7**	**39.7**	**42.8**	**29.9**	**-59.4**	**-30.1**
Oil flyash	% production	0	0	100	100	82.6	0	-17.4
Other hazardous special waste								
electricity generation	% production	16.0	32.1	30.4	97.8	89.1	456	-8.90
electricity distribution	% production	29.6	28.3	90.1	95.3	100	237	4.90
fuel storage & handling, gas distribution	% production	0	0	0	72.8	99.3	0	36.4
Total	**% production**	**21.4**	**29.2**	**51.2**	**96.6**	**92.9**	**334**	**-3.80**
Total hazardous special waste								
electricity generation	% production	15.3	29.5	35.7	98.1	88.3	477	-10.0
electricity distribution	% production	29.6	28.3	90.1	95.3	100	237	4.90
fuel storage & handling, gas distribution	% production	0	0	0	72.8	99.3	0	36.4
Total	**% production**	**20.8**	**28.6**	**53.7**	**96.8**	**92.1**	**342**	**-4.90**
Total special waste								
electricity generation	% production	73.8	52.6	41.5	44.2	28.7	-61.1	-35.1
electricity distribution	% production	8.37	8.81	9.72	31.8	100	1,094	214
fuel storage & handling, gas distribution	% production	0	0	0	67.5	100	0	48.1
Total	**% production**	**73.4**	**50.4**	**39.8**	**43.4**	**30.1**	**-59.0**	**-30.6**
Mining & extracting activities (1)								
Yield of the site (open-pit mine)	million m^3 of moved soil/ million t of extracted mineral	0	42.6	10.5	9.31	15.3	0	64.3
Percentage of extracted soil used to restore the area	%	0	0	0	1.03	1.92	0	86.4

-: no data due to absence of activities in the year.
(1) These activities have been surveyed since 2008.

Highlights of 2011

Electricity generation was up by ~8 TWh: the increase in thermal generation from fossil fuels (over 13 TWh, i.e. +~45%) more than offset the decrease in generation from renewables (about -1.8 TWh), in particular hydro (-~1.6 TWh), and in nuclear generation (-~2.5 TWh).

EN1 As regards expendables, the consumption of ammonia and limestone (the latter used for flue-gas desulfurization) rose sharply, owing to the strong growth of thermal generation from coal and brown coal.

EN1 EN3 The use of non-fossil fuels in thermal generation grew slightly. This generation comes from:

> solid biomass from the processing of olive stones (used as main fuel), whose amount mounted from ~25,400 to ~38,266 toe;
> biogases from landfills and waste water treatment, which climbed from ~14,800 to ~15,000 toe.

Conversely, the use of fossil fuels in thermal generation recorded an increase on 2010, passing from less than 7 ktoe to over 9 ktoe. In the fossil fuel mix, coal and brown coal were up by ~10 percentage points and ~5.5 percentage points, respectively, to the expense of the other components: natural gas (-~0.5 percentage points), gas oil (-~6 percentage points) and fuel oil (-~9 percentage points), almost exclusively LS fuel oil.

EN5 EN6 EN18 Enel Green Power España commissioned new wind farms with an overall capacity of 245 MW:

> Cogollos, in the Castilla y León region;
> Lanchal and Pucheruelo, in the Ávila province, Castilla y León region;
> Los Llanos, located near Burgos, Castilla y León region;
> Granujales, near Cádiz, Andalusia;
> Valdihuelo, in the Ávila province, Castilla y León region;
> Aguilón, located in the homonymous municipality, province of Zaragoza, Aragon.

Enel Green Power España also acquired a 16.67% holding in Sociedad Eólica de Andalucía (SEA), owned by Desarrollos Eólicos Promoción SA (DEPSA), a company belonging to the Energias de Portugal (EDP) Group. With this acquisition, Enel Green Power España increased its stake in SEA from 46.67% to 63.34% and became its majority shareholder. SEA owns the two wind farms of Planta Eólica del Sur and Energía Eólica del Estrecho in the Cádiz province.

In Spain, Enel operates through Endesa (thermal, nuclear and renewable power generation, electricity distribution and sales) and Enel Green Power (renewable power generation and combined heat & power generation in small plants).

The considerable change in renewable power generation assets in 2009 vs. 2008 is due to the transfer of some assets to Acciona in connection with the deal under which Acciona sold its stake in Endesa to Enel.

EN16 EN20 Higher coal- and brown coal-fired thermal generation caused specific emissions of all major pollutants into the atmosphere to go up; the only exception was NO_X, which shrank thanks to the investments better described under indicator EN26.

EN18 In 2011, CO_2 emissions displaced by carbon-free generation amounted to roughly 27 million tonnes, of which 20 due to nuclear generation and 7 due to generation from renewables.

EN22 In 2011, the percentage of recovery of waste diminished in connection with lower recovery of gypsum and ash from coal- and brown coal-fired generation. Specific production of coal and brown-coal ash rose considerably (from about 50 g/kWh to about 77) because of the higher weight of these two fuels in the fuel mix for thermal generation.

EN23 28 m^3 of fuel oil spilled from the thermal plant of Alcudia. The oil was collected inside the spill containment basin and then entirely removed therefrom. As a result, the spill did not cause any impact on the environment.

EN26 Environmental enhancements.

Water

- Thermal plant of Compostilla: the bottom ash extraction system of units 2 and 3 was converted into a closed-system permitting water reuse.
- Carboneras port terminal: prohibition of using water to clean the coal-loading piers of the terminal. The coal fallen on the piers will be collected by a high-vacuum suction aspirator.
- Electricity distribution in the Canary Islands: lower consumption of drinking water in offices after analyses of consumption, repair of leaks and installation of automatic taps and dual-flush buttons for toilet water.
- Diesel-fired thermal plant of Punta Grande: improvement of the drinking water supply system by replacing worn parts.

Emissions

- Thermal plant of Compostilla: reduction of NO_X emissions after installation of low-NO_X burners.
- Hydro plants of Sur: replacement of SF_6-containing circuit breakers with vacuum circuit breakers, with zero emission risks.
- Diesel-fired thermal plant of Los Guinchos: installation of a more efficient injector cooling system which decreases the amount of particulates.
- Diesel-fired thermal plant of Punta Grande: abatement of sulfur content in the fuel from 1% to 0.73%.

Materials and Resources

- In hydro and thermal generation and in fuel storage & handling facilities, increased use of biodegradable greases and oils in place of non-ecological materials.
- Hydro plants of Sur: replacement of oil-filled transformers with dry transformers. Diesel-fired thermal plant of Los Guinchos: replacement of disposable batteries with rechargeable ones.

Waste

- Port terminal of Los Barrios: the amount of used lead batteries is planned to be reduced by 2% through careful management of devices using them, awareness actions among employees and better control of their disposal.
- Diesel-fired thermal plant of Punta Grande: 10% cut in production of contaminated plastic waste and 5% cut in the amount of used oils thanks to employees' and suppliers' awareness actions.

Noise

- Diesel-fired thermal plant of Los Guinchos: noise shielding of the diesel engine area and installation of silencers in the ventilation system.
- Electricity distribution in the Canary Islands: revamping of the transformer ventilation-extraction system (which was too noisy) in the Guanarteme and Lomo Maspalomas substations.
- Diesel-fired thermal plant of Punta Grande: replacement of silencers in units 1, 2 and 3, improved noise abatement in the engine area and replacement of silencers in the flue-gas duct.

Liquid releases

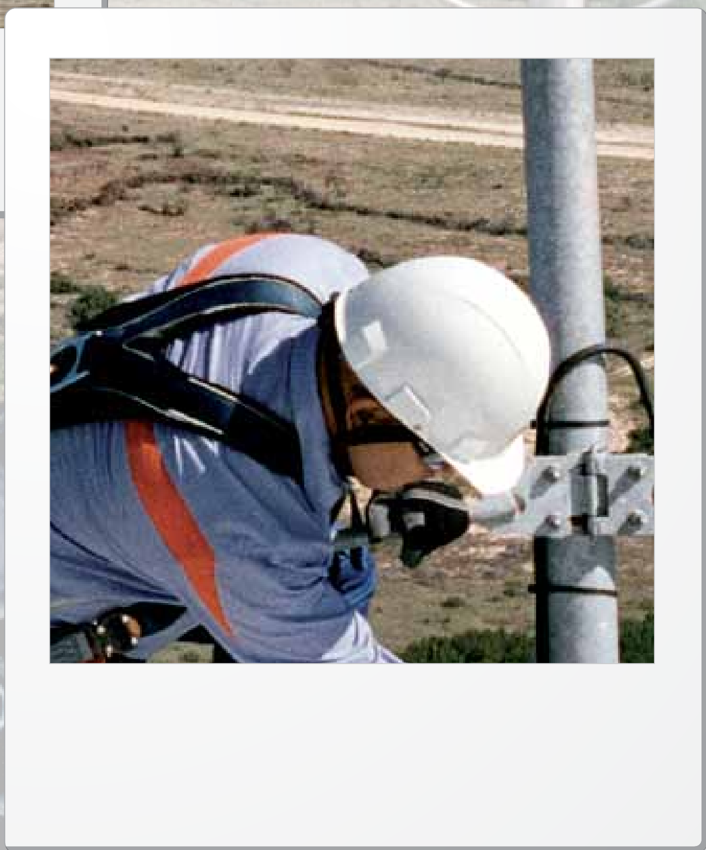
- Thermal plant of Compostilla: installation of water/oil separation tanks (trap tanks) in the drainage systems of transformer pits.
- Thermal plant of Los Guinchos: installation of a new biological water treatment system.

Soil

- Diesel-fired thermal plant of Punta Grande: revamping of one of the exhausted oil tanks (new insulation, replacement of pumps, improvement of the drainage system).

EN29 As regards land and landscape protection efforts, the use of underground cables in power lines in 2011 was up by about 4 percentage points, with obvious advantages (in terms of visual impact and avian-fauna electrocution risk) with respect to the use of overhead cables.

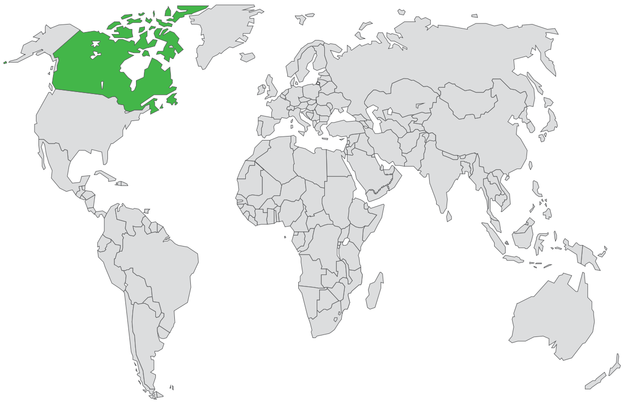
North America

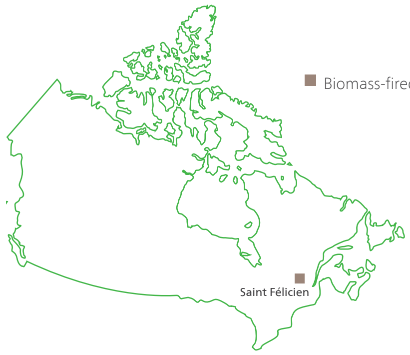


Canada

Biomass-fired combined
heat & power generation

Enel Green Power SpA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
1	21	175

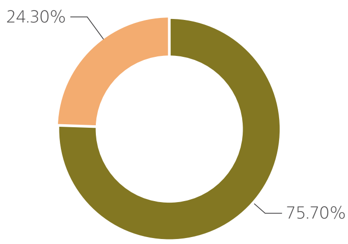
Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW	Useful thermal capacity 10^6 kcal/h
Steam (condensing)	**1**	**1**	**21**	**6**

Fuel consumption
Total: 78,230 toe
100% from biomass

Net electricity generation
Total: 175 million kWh

Expendables
Total: 13 t



Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate
Lubricating oil

Useful heat output (combined with power generation)

29,117 million kcal
equal to 34 million kWh

Waste waters

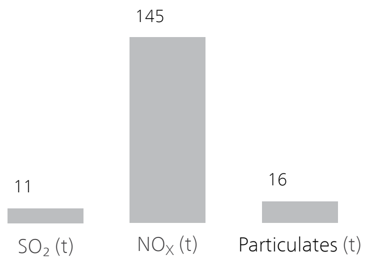
63,250 m^3
Discharged

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

Water for industrial uses

706,140 m^3
Abstraction from inland waters (from aqueducts only)

Emissions into the atmosphere



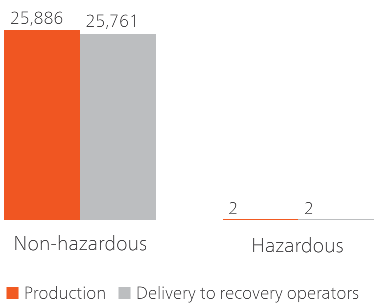
Avoided CO_2 emissions

124,692 t
Due to thermal generation from biomass

Emissions from the otherwise necessary fossil-fired thermal generation.

Special waste

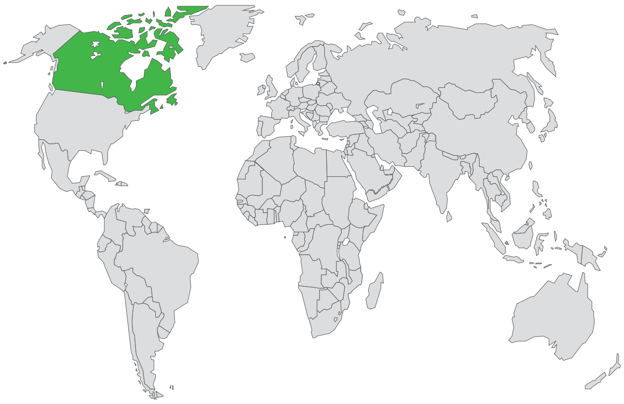
Total production: **25,888 t**
Total delivery to recovery operators: **25,763 t**

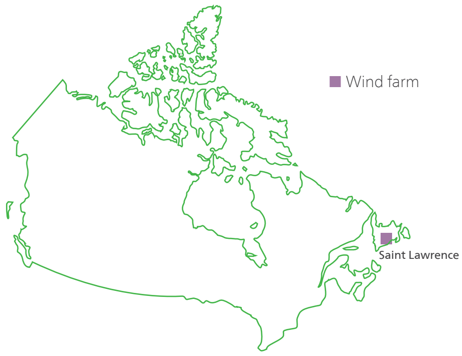


Canada

Wind power generation

Enel Green Power SpA





The Numbers

Power plants
1

Net capacity (MW)
27

Generation (million kWh)
110

Power installations

	Power plants no.	Net maximum electrical capacity MW
	1	**27**

Net maximum electrical capacity
Total: 27 MW

Equivalent yearly hours of utilization*

Wind: **4,074 hours**

* Yearly generation/capacity ratio.

Expendables
Total: 14 t
100% dielectric oil

Net electricity generation
Total: 110 million kWh

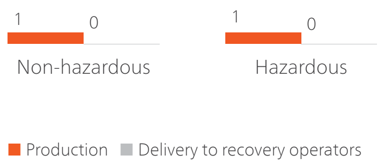
Avoided CO_2 emissions

Due to electricity generation from biomass:
78,512 t

Emissions from the otherwise necessary fossil-fired thermal generation.

Special waste

Total production: **2 t**
Total delivery to recovery operators: **0 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	1	1	1	1	1
hydro	no.	1	-	-	-	-
wind	no.	0	1	1	1	1
Net maximum electrical capacity	MW	8.40	27.0	27.0	27.0	27.0
hydro	MW	8.40	-	-	-	-
wind	MW	0	27.0	27.0	27.0	27.0
Combined heat & power installations						
Power plants (thermal)	no.	1	1	1	1	1
Net maximum electrical capacity (thermal)	MW	21.4	21.4	21.4	21.4	21.4
Useful thermal capacity (thermal)	million kcal/h	7.36	5.78	5.78	5.68	5.68

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Combined heat & power generation						
gas oil	thousand t	0.031	0	0	0	0
	thousand toe	0.032	0	0	0	0
	TJ	1.34	0	0	0	0
EN1 EN3 **Biomass and waste**						
Combined heat & power generation						
solid biomass	t	400,458	450,889	402,877	402,568	354,242
	toe	89,181	100,412	89,720	89,651	78,230
	TJ	3,734	4,204	3,756	3,753	3,275
EN8 **Water for industrial uses**						
From aqueducts	million m^3	0.715	0.638	0.621	0.765	0.706
for thermal generation (CHP)	million m^3	0.715	0.638	0.621	0.765	0.706
EN1 **Expendables**						
Resins	t	0.350	0.300	0	0	0
Sodium hypochlorite	t	12.2	13.2	10.1	10.2	9.95
Sulfuric & hydrochloric acids	t	56.4	58.4	5.10	0	0
Lubricating oil	t	3.55	3.14	2.23	2.38	3.20
Dielectric oil	t	0	0	0	0.171	14.3
Total	**t**	**72.5**	**75.0**	**17.5**	**12.7**	**27.5**
for thermal generation (CHP)	t	72.2	75.0	17.5	12.5	13.1
for hydro generation	t	0.350	0	0	0	0
for wind generation	t	0	0	0	0.171	14.3

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables	million kWh	323	180	251	281	285
biomass and biodegradable fraction of waste	million kWh	175	172	149	182	175
combined with heat generation	million kWh	175	172	149	182	175
hydro from natural flows	million kWh	148	-	-	-	-
wind	million kWh	-	7.82	102	99.0	110
Total	**million kWh**	**323**	**180**	**251**	**281**	**285**
simple	million kWh	148	7.82	102	99.0	110
combined with heat generation	million kWh	175	172	149	182	175
Useful heat output (combined with power generation)						
In thermal power plants (biomass and biodegradable fraction of waste)	million kcal	29,626	30,149	23,042	32,524	29,117
	million kWh	34.5	35.1	26.8	37.8	33.9

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation (CHP)	thousand t	0.001	0.009	0.002	0	0.011
EN20 NO_X	thermal generation (CHP)	thousand t	0.017	0.048	0.087	0.076	0.145
EN20 Particulates	thermal generation (CHP)	thousand t	0.080	0.029	0.040	0.032	0.016
EN16 CO_2	fossil-fired thermal generation (CHP) (from combustion)	thousand t	0.195	0	0	0	0
	various activities	thousand t	0.004	0	0	0	0
	Total	**thousand t**	**0.199**	**0**	**0**	**0**	**0**
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		thousand t of CO_2 equivalent	0.199	0	0	0	0
EN18 **Avoided CO_2 emissions**							
Due to wind and solar (photovoltaic) generation		thousand t	0	0	72.9	70.7	78.5
Due to generation from biomass & biodegradable fraction of waste		thousand t	0	0	107	130	125
Due to generation from renewables		**thousand t**	**0**	**0**	**179**	**200**	**203**
EN21 **Waste waters (discharged quantity)**	thermal generation (CHP)	million m^3	0.201	0.130	0.116	0.105	0.063

-: no data due to absence of activities in the year.

	Source		2007	2008	2009	2010	**2011**
EN21 Conventional polluting load of waste waters discharged by plants							
Total phosphorus (expressed as P)	thermal generation (CHP)	kg	0	0	0	0	75.0
	in some plants with an overall capacity of	MW	0	0	0	0	21.4
COD	thermal generation (CHP)	kg	7,368	14,335	439	4,331	0
	in some plants with an overall capacity of	MW	21.4	21.4	21.4	21.4	0
BOD	thermal generation (CHP)	kg	2,845	5,717	1,109	4,178	0
	in some plants with an overall capacity of	MW	21.4	21.4	21.4	21.4	0
EN22 Non-hazardous special waste							
Biomass bottom ash	fossil-fired thermal generation (simple and CHP)						
production		t	8,978	12,350	14,129	10,100	7,070
delivery to recovery operators		t	8,855	12,350	14,129	10,100	7,070
Biomass flyash	fossil-fired thermal generation (simple and CHP)						
production		t	18,493	25,438	24,023	22,592	18,635
delivery to recovery operators		t	18,232	25,438	24,023	22,592	18,635
Other	electricity generation & geothermal drilling						
production		t	0	0.005	0	191	181
delivery to recovery operators		t	0	0.005	0	50.7	55.5
Total	**electricity generation & geothermal drilling**						
production		**t**	**27,471**	**37,788**	**38,152**	**32,882**	**25,886**
delivery to recovery operators		**t**	**27,087**	**37,788**	**38,152**	**32,742**	**25,760**
EN22 Hazardous special waste	electricity generation & geothermal drilling						
production		t	0.959	0	0.408	3.57	3.17
of which with PCBs		*t*	*0.959*	*0*	*0.387*	*2.45*	*1.19*
delivery to recovery operators		t	0.078	0	0.408	2.55	2.14
of which with PCBs		*t*	*0.009*	*0*	*0.387*	*2.45*	*1.19*
EN22 Total special waste	electricity generation & geothermal drilling						
production		t	27,472	37,788	38,153	32,886	25,889
delivery to recovery operators		t	27,087	37,788	38,153	32,745	25,763

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation (CHP)	kcal/kWh	4,254	4,845	5,093	4,084	3,751	-11.8	-8.20
EN8 Net specific requirements of water for industrial uses in thermal generation (CHP)	liters/kWh	3.41	3.08	3.53	3.49	3.39	-0.600	-2.90
Net total specific requirements of water for industrial uses	liters/kWh	2.00	2.97	2.23	2.4	2.22	11.0	-7.50
EN8 Coverage of requirements of water for industrial uses								
from aqueducts	% of requirements	100	100	100	100	100	0	0
EN1 EN3 Fossil fuel consumption for thermal generation								
gas oil	% of total fuel consumption	100	0	0	0	0	-100	0
Electricity generation from renewables								
thermal from biomass & biodegradable fraction of waste	% of total generation	54.2	95.7	59.4	64.7	61.4	13.3	-5.10
hydro from natural flows	% of total generation	45.8	0	0	0	0	-100	0
wind and solar (photovoltaic)	% of total generation	0	4.34	40.6	35.3	38.6	0	9.30
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation - CHP)	g/kWh thermal net	0.005	0.043	0.011	0	0.053	960	0
EN20 NO_X (thermal generation - CHP)	g/kWh thermal net	0.081	0.232	0.494	0.346	0.695	758	100
EN20 Particulates (thermal generation - CHP)	g/kWh thermal net	0.382	0.140	0.227	0.146	0.077	-79.8	-47.3
EN16 CO_2 (thermal generation - CHP)	g/kWh thermal net	0.930	0	0	0	0	-100	0
EN20 SO_2 (total from thermal generation - simple and CHP)	g/kWh total net	0.003	0.042	0.007	0	0.035	1,066	0
EN20 NO_X (total from thermal generation - simple and CHP)	g/kWh total net	0.048	0.223	0.313	0.239	0.455	847	90.4
EN20 Particulates (total from thermal generation - simple and CHP)	g/kWh total net	0.224	0.135	0.144	0.100	0.050	-77.7	-50.0
EN16 CO_2 (total from thermal generation - simple and CHP)	g/kWh total net	0.545	0	0	0	0	-100	0
Net specific conventional polluting load of waste waters discharged by plants (CHP)								
Total phosphorus (expressed as P)	mg/kWh	0	0	0	0	0.360	0	0
COD	mg/kWh	0	0	0	19.7	0	0	-100
BOD	mg/kWh	0	0	0	19.0	0	0	-100

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 **Waste recovery**								
Coal and brown-coal ash	% production	98.6	100	100	100	100	1.40	0
bottom ash	*% production*	*98.6*	*100*	*100*	*100*	*100*	*1.40*	*0*
flyash	*% production*	*98.6*	*100*	*100*	*100*	*100*	*1.40*	*0*
Other non-hazardous special waste								
electricity generation	% production	0	100	0	26.5	30.6	0	15.5
Total non-hazardous special waste								
electricity generation	% production	98.6	100	100	99.6	99.5	0.900	-0.100
Other hazardous special waste								
electricity generation	% production	8.13	0	100	71.4	67.5	730	-5.50
Total special waste								
electricity generation	% production	98.6	100	100	99.6	99.5	0.900	-0.100

Highlights of 2011

EN18 In 2011, CO_2 emissions displaced by carbon-free generation amounted to about 203,000 tonnes (practically in line with the ones of last year), of which 125,000 due to CHP thermal generation and 78,000 due to wind power generation.

In Canada, Enel operates through Enel Green Power (CHP thermal and wind power generation).

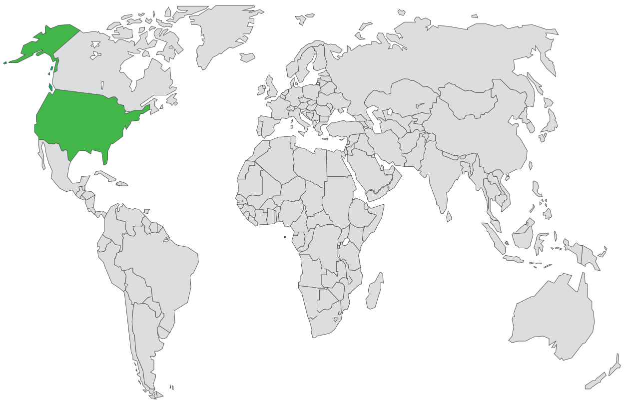
EN20 The erratic trends of total and specific emissions of NO_X and particulates may be attributed to the irregular monitoring of emissions and to the consequent results of the computation of annual mass quantities (obtained by multiplying the average concentrations by the annual flue-gas volumes). This inevitably involves inaccuracies which are due to fluctuating concentrations associated with the variable generating outputs of the plants.

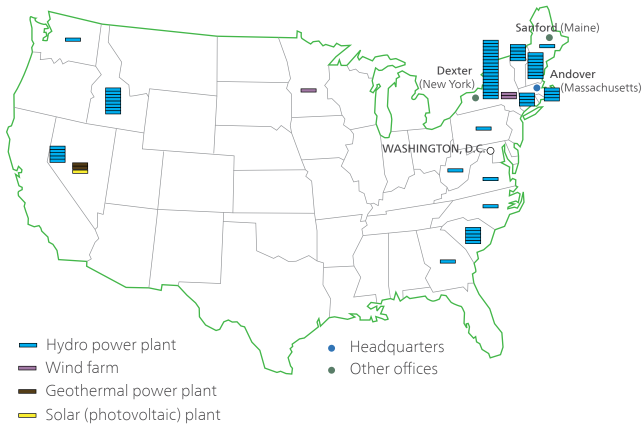
EN22 The recovery of hazardous and non-hazardous waste (entirely consisting of recoverable items, i.e. iron and aluminum) was close to 100%.

United States

Hydro, wind, geothermal and solar (photovoltaic) power generation

Enel Green Power SpA





The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
89	962	2,637

GEOTHERMAL	Power plants no.	Generating units no.	Net maximum electrical capacity MW
Binary cycle	**2**	**6**	**47**

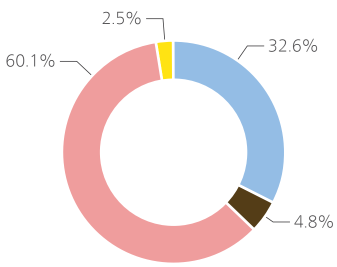
Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	64	75	286
Pondage/reservoir	1	1	27
	65	**76**	**313**

WIND	Power plants no.	Net maximum electrical capacity MW
	21	**578**

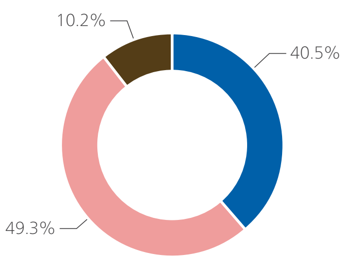
SOLAR PHOTOVOLTAIC	Power plants no.	Net maximum electrical capacity MW
	1	**24**

Net maximum electrical capacity
Total: 962 MW



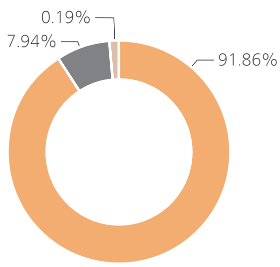
Hydro
Geothermal
Wind
Solar (photovoltaic)

Net electricity generation
Total: 2,637 million kWh



Hydro from natural flows
Wind
Geothermal

Expendables
Total: 11 t



Lubricating oil
Dielectric oil
Other

Equivalent yearly hours of utilization*

5,709 geothermal

3,411 hydro

2,249 wind

* Yearly generation/capacity ratio (excluding hydro from pumped storage).

Avoided CO_2 emissions (t)

Due to hydro generation from natural flows	940,711
Due to geothermal generation	236,148
Due to wind generation	1,143,446
Total	**2,320,305**

Emissions from the otherwise necessary fossil-fired thermal generation.
The contribution of geothermal generation has been calculated on the assumption that the related CO_2 emissions are of natural origin.

Emissions into the atmosphere

SF_6 - all types of generation (kg)	1
(t of CO_{2eq})	32

A large debate is under way on the natural or anthropogenic origin of emissions of incondensible gases from geothermal fluid.

Geothermal fluid

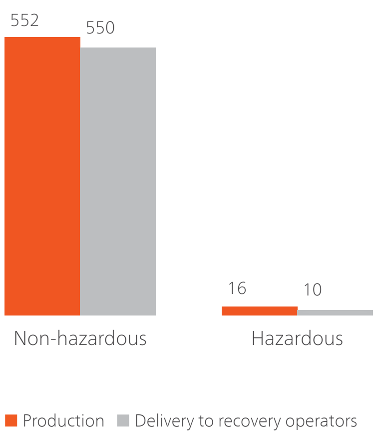
Total fluid extracted: **43,922,000 t**

Steam used for electricity generation: **43,922,000 t**

Geothermal fluid may not have or may have lost the thermodynamic properties that make it suitable for geothermal generation. In this case, the fluid is used for supply of heat, especially for greenhousing and district heating.

Special waste

Total production: **568 t**
Total delivery to recovery operators: **560 t**



Other data

Hydro

Emptied reservoirs

Quantity: **1**

Alluvial sediments removed by mechanical equipment : **30 m³**
(of which reused locally: **30 m³**)

Fish ladders: **11**

Fish restocking campaigns

Quantity: **4**

Restocked fish:
919,004 individuals
in addition to **5,743 kg**

Geothermal activities

In-service wells: **34**

for steam production: **17**

for reinjection: **17**

Wind generation

Wind systems

Surface area occupied by platforms, service roads, buildings: **127 ha**

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	70	72	88	88	89
hydro	no.	65	65	65	65	65
geothermal	no.	1	1	2	2	2
wind	no.	4	6	21	21	21
solar (photovoltaic)	no.	0	0	0	0	1
Net maximum electrical capacity	MW	443	701	740	740	962
hydro	MW	306	306	314	314	313
geothermal	MW	7.00	16.0	46.5	46.5	46.5
wind	MW	130	379	379	379	578
solar (photovoltaic)	MW	0	0	0	0	24.0

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Various activities	thousand toe	0.002	0.015	-	-	-
	TJ	0.084	0.628	-	-	-
EN1 EN3 **Geothermal fluid**						
Total fluid extracted	thousand t	11,597	9,199	29,597	45,473	43,922
Used for electricity generation	thousand t	11,597	9,199	29,597	45,473	43,922
EN8 **Water for industrial uses**						
From wells	million m^3	0	0	0.136	0	0
From aqueducts	million m^3	0	0	0.006	0	0
Total abstraction from inland waters (for geothermal drilling)	**million m^3**	0	0	**0.142**	0	0
EN1 **Expendables**						
Sulfuric & hydrochloric acids	t	-	-	22.0	0	0
Caustic soda	t	-	-	0.400	0	0
Bentonite	t	-	-	380	0	0
Barite	t	-	-	260	0	0
Geothermal cement	t	-	-	1,230	0	0
Lubricating oil	t	22.8	9.18	8.01	8.91	10.4
Dielectric oil	t	0	2.69	0	0.050	0.903
Other	t	0	0.217	0.115	2.59	0.022
Total	**t**	**22.8**	**12.1**	**1,901**	**11.6**	**11.4**
for hydro generation	t	9.85	11.1	7.47	10.6	8.24
for geothermal activities	t	13.0	1.00	1,892	0	0
for wind generation	t	0	0	0.653	1.0	3.13

-: no data due to absence of activities in the year.

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables	million kWh	1,046	1,651	2,172	2,366	2,637
geothermal	million kWh	49.4	36.6	150	248	268
hydro from natural flows	million kWh	810	926	997	919	1,069
wind	million kWh	187	689	1,025	1,198	1,299
Geothermal drilling						
Extent	m	0	1,588	12,992	0	152

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN16 CO_2	various activities	thousand t	0.006	0	0	0	0
EN16 SF_6	electricity generation	kg	0	0.005	1.46	1.45	0
		thousand t of CO_2 equivalent	0	0	0.033	0.033	0
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**0.006**	**0**	**0.033**	**0.033**	**0**
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	704	815	877	809	941
Due to geothermal generation		thousand t	42.9	32.2	132	218	236
Due to wind and solar (photovoltaic) generation		thousand t	163	606	902	1,054	1,143
Due to generation from renewables		**thousand t**	**910**	**1,453**	**1,911**	**2,082**	**2,320**
EN22 Non-hazardous special waste							
production	electricity generation & geothermal drilling	t	0	3.00	5.01	442	552
delivery to recovery operators	electricity generation & geothermal drilling	t	0	3.00	5.01	442	550
EN22 Hazardous special waste	electricity generation & geothermal drilling						
production		t	33.9	19.7	17.8	47.4	15.8
of which with PCBs		*t*	*17.9*	*19.1*	*10.7*	*44.1*	*12.5*
delivery to recovery operators		t	33.9	12.4	18.2	44.2	10.2
of which with PCBs		*t*	*17.9*	*11.8*	*11.3*	*42.2*	*9.33*
EN22 Total special waste	electricity generation & geothermal drilling						
production		t	33.9	22.7	22.9	490	568
delivery to recovery operators		t	33.9	15.4	23.2	487	560

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of geothermal generation	kcal/kWh	39,083	41,313	28,651	25,928	23,589	-39.6	-9.00
Net total specific requirements of water for industrial uses	liters/kWh	0	0	0.065	0	0	0	0
EN8 Coverage of requirements of water for industrial uses								
from wells	% of requirements	0	0	95.8	0	0	0	0
from aqueducts	% of requirements	0	0	4.23	0	0	0	0
EN1 EN3 Fossil fuel consumption for thermal generation								
geothermal fluid used for electricity generation	% of total geothermal fluid extracted	100	100	100	100	100	0	0
Electricity generation from renewables								
geothermal	% of total generation	4.72	2.21	6.90	10.5	10.2	116	-2.90
hydro from natural flows	% of total generation	77.4	56.1	45.9	38.9	40.5	-47.7	4.10
wind and solar (photovoltaic)	% of total generation	17.9	41.7	47.2	50.6	49.3	175	-2.60
Specific emissions into the atmosphere								
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0	0.006	0.298	0.228	0	0	-100
EN22 Waste recovery								
Other non-hazardous special waste								
electricity generation & geothermal drilling	% production	0	100	100	100	99.6	0	-0.400
Other hazardous special waste								
electricity generation & geothermal drilling	% production	100	63.2	102	93.4	64.5	-35.5	-30.9
Total special waste								
electricity generation & geothermal drilling	% production	100	68.1	102	99.3	98.6	-1.40	-0.700

Highlights of 2011

Total electricity generation from renewables was up by about 300 GWh (+11%) on 2010 thanks to higher contributions from hydro, geothermal and wind power generation.

In the United States, Enel operates through Enel Green Power (hydro, geothermal, wind and solar photovoltaic power generation).

EN5 The heat rate of geothermal plants continued to have a downward trend – from 25,929 kcal/kWh in 2010 to 23,588 in 2011 (-~10%) – thanks to the commissioning of two more efficient, low-enthalpy plants in 2009, whose generation gradually replaced the one of less efficient plants.

EN5 EN6 EN18 Enel Green Power North America increased its net maximum capacity by roughly 200 MW (wind farms) and by 24 MW (photovoltaic plants):

> it put into operation the photovoltaic plant integrating the geothermal plant of Stillwater;
> it put into operation the Caney River wind farm (Elk county, Kansas);
> together with its development partner, TradeWind Energy, it began the construction of the Rocky Ridge wind farm (51% owned) in the Kiowa and Washita counties, Oklahoma.

EN18 In 2011, CO_2 emissions displaced by carbon-free generation amounted to roughly 2.4 million tonnes (over 11% more than in 2010).

EN22 The recovery of waste continued to be high (nearly 100%).

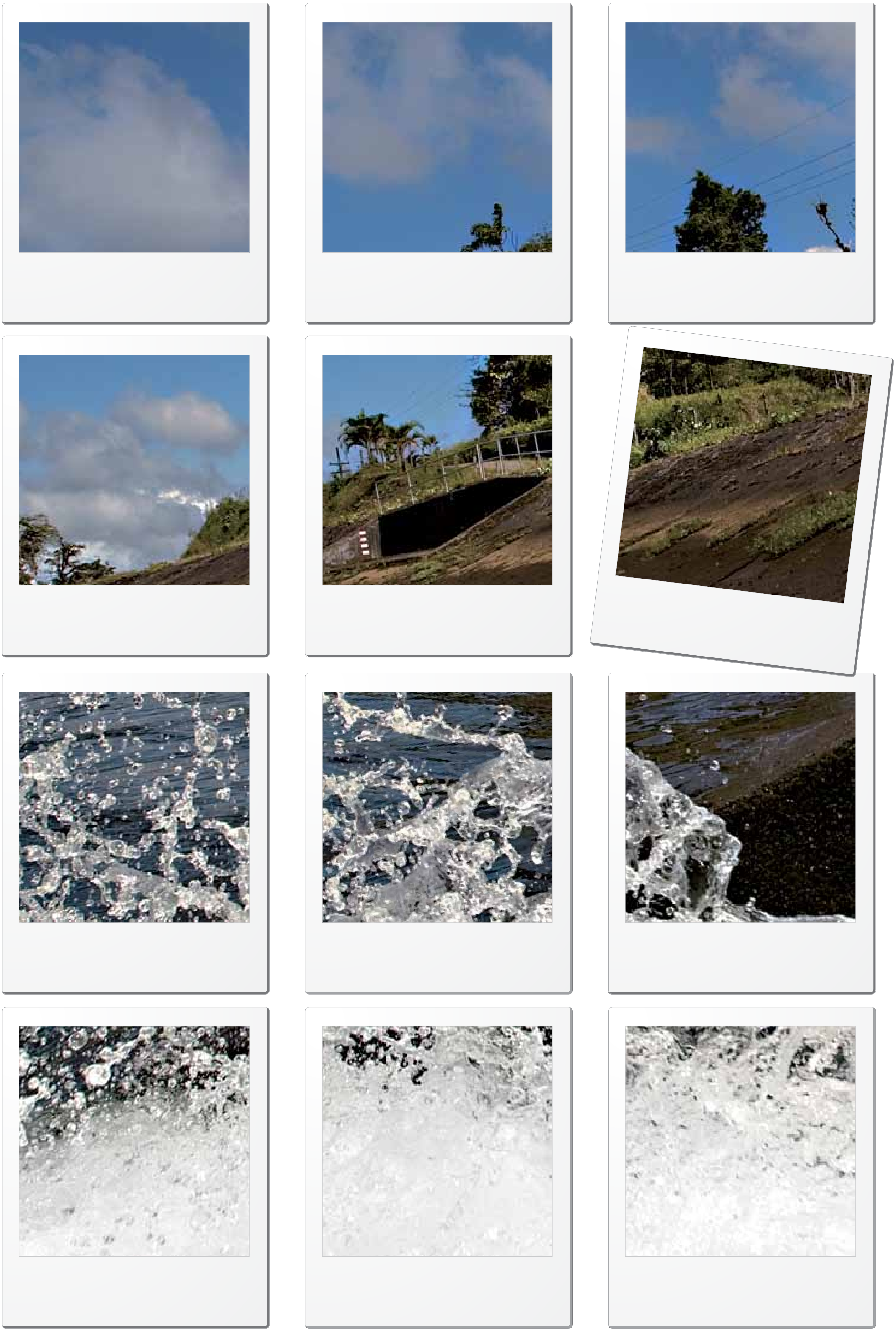
EN26 Environmental enhancements.

Waste

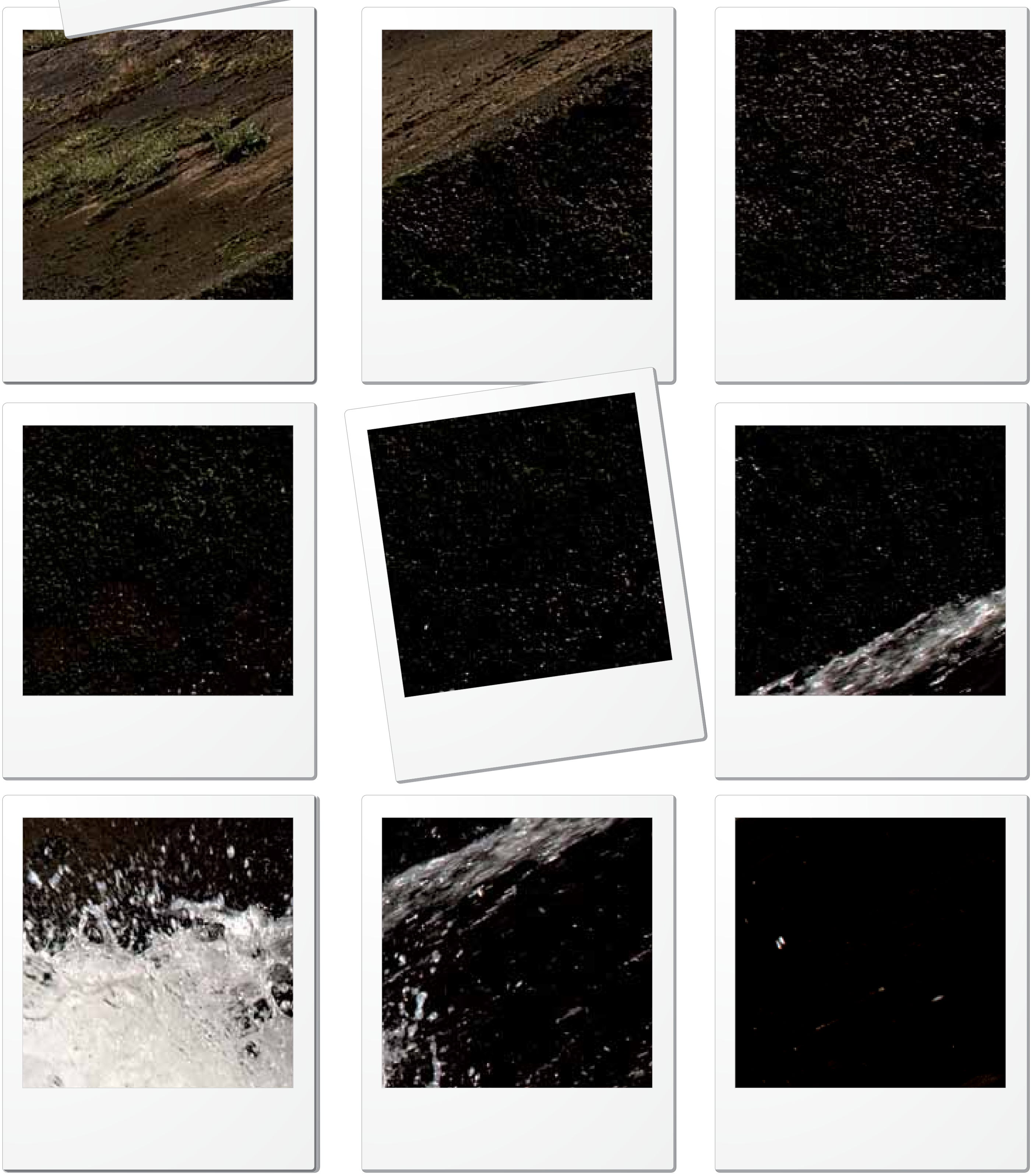
> Piedmont: voluntary initiatives of waste collection along the river.

Other

> Glendale hydroelectric project, along the Housatonic river (Stockbridge, Massachusetts): improvements were made to increase the use of and the recreational opportunities offered by the lake and the surrounding landscape. A trail along the dam, a pedestrian and vehicle access road and a guided trail with appropriate signage were created.
> Coneross: improvements were made to increase the use of and the recreational opportunities offered by the area, which was completely buried by sand from floods.

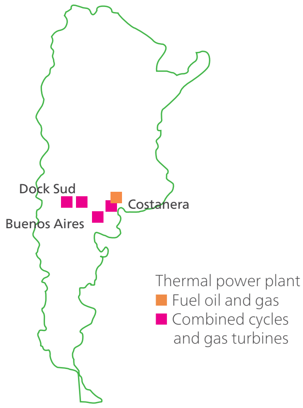


Latin America



Argentina

Thermal power generation Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
5	3,075	13,556

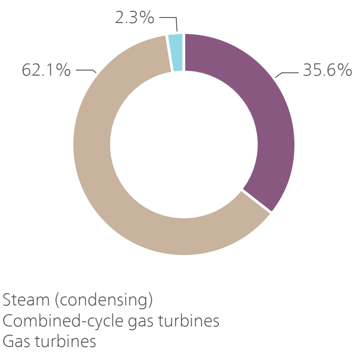
Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW
Steam (condensing)	1	6	1,096
Combined-cycle gas turbines	3	8	1,910
Gas turbines	1	2	69
	5	**16**	**3,075**

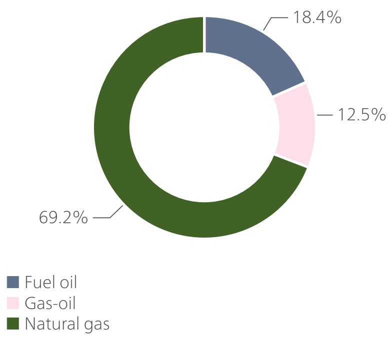
All the power plants are ISO 14001-certified.

Net electricity generation
Total: 13,556 million kWh

Net maximum electrical capacity
Total: 3,075 MW



Fuel consumption
Total: 2,721,595 t of oil-equivalent



Water for industrial uses

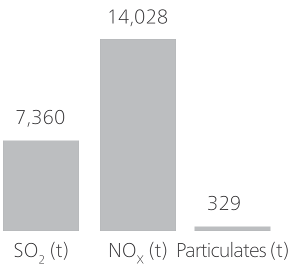
2,655,695 m^3
Abstraction from inland waters

Waste waters

1,165,386 m^3
Discharged

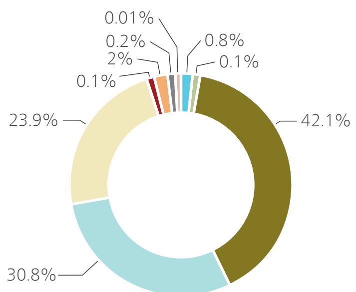
Waste waters include those meteoric waters that are susceptible to pollution and are therefore fed to treatment systems before being discharged or used.

Emissions into the atmosphere



CO_2: **6,950,293 t**

Expendables
Total: 6,759 t



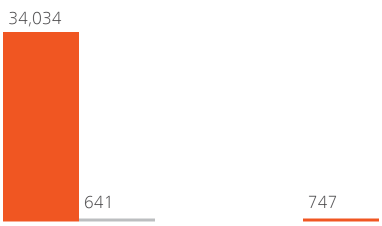
- Resins, hydrazine, carbohydrazide & hydrogen peroxide
- Ammonia
- Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate
- Sulfuric & hydrochloric acids
- Caustic soda
- Lime, ferric chloride and polyelectrolyte
- Lubricating oil
- Dielectric oil
- Other

Special waste

Total production: **34,781 t**
Total delivery to recovery operators: **641 t**

Non-hazardous
Production: 34,034 t
Delivery to recovery operators: 641 t

Hazardous
Production: 747 t
Delivery to recovery operators: 0 t

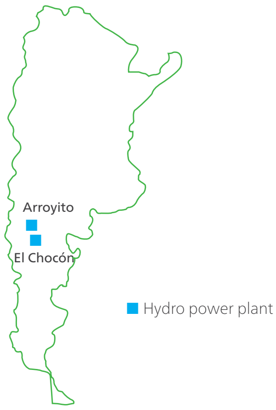


Production   Delivery to recovery operators

Argentina

Hydro power generation

Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
2	1,328	2,404

Power installations

	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Pondage/reservoir	**2**	**9**	**1,328**

All the power plants are ISO 14001-certified.

Wind power generation

Total: 1,328 MW

Net electricity generation

Total: 2,404 million kWh

Expendables

Total: 0.5 t

100% lubricating oil

Avoided CO_2 emissions

Due to hydro generation from natural flows:
1,232,735 t

Emissions from the otherwise necessary fossil-fired thermal generation.

Equivalent yearly hours of utilization*

Hydro: **1,810 hours**

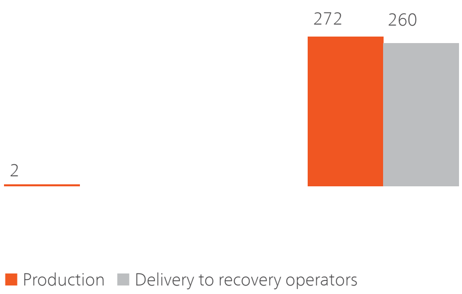
* Yearly generation/capacity ratio. For Endesa generation is considered to refer to the entire year.

Special waste

Total production: **274 t**
Total delivery to recovery operators: **260 t**

Non-hazardous
Production: 2 t
Delivery to recovery operators: 0 t

Hazardous
Production: 272 t
Delivery to recovery operators: 260 t



Argentina

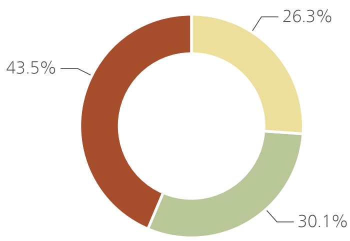
Electricity distribution

Endesa SA

● Headquarters of the company of the Group carrying out the activity (Edesur)

The Numbers

Substations	Capacity (MVA)	Total lines (km)
23,578	17,198	24,470



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	67	11,547
MV/LV	23,520	5,651
	23,587	**17,198**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	546	-	593	**1,139**
MV	3,199	122	4,025	**7,346**
LV	2,704	7,247	6,034	**15,985**
	6,449	**7,369**	**10,652**	**24,470**

The organization has an ISO 14001-certified environmental management system in place.

General data

Municipalities served: **13**

Surface area served: **3,309 km²**

Customers connected to the grid: **2,388,605** (of which supplied by companies of the Group: **2,387,950**)

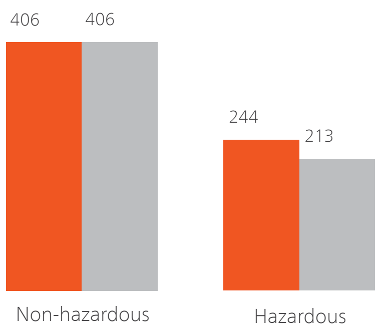
Resource consumption

Expendables: **2.5 t**

Special waste

Total production: **650 t**

Total delivery to recovery operators: **618 t**



■ Production ■ Delivery to recovery operators

Electricity

Total electricity distributed: **17,233 million kWh**

Own consumption for grid operation: **28 million kWh**

Emissions into the atmosphere

SF_6: **66 kg (1,473 t of CO_2 equivalent)**

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	8	8	7	7	7
thermal	no.	6	6	5	5	5
hydro	no.	2	2	2	2	2
Net maximum electrical capacity	MW	3,026	3,032	4,403	4,403	4,403
thermal	MW	2,141	2,141	3,075	3,075	3,075
hydro	MW	885	890	1,328	1,328	1,328
Power lines (circuit-length)						
Total	km	15,867	16,124	24,256	24,417	24,470
high-voltage	km	795	779	1,162	1,162	1,139
medium-voltage	km	4,587	4,774	7,223	7,318	7,346
low-voltage	km	10,486	10,570	15,871	15,937	15,985
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.	0	0	0	0	12
vehicles for both private and service use	no.	0	0	0	0	42
Gross real-estate surface area	thousand m^2	0	0	0	0	33.5

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
fuel oil (LS)	thousand t	79.4	287	333	466	514
	thousand toe	76.2	284	328	458	500
gas oil	thousand t	47.3	169	131	339	332
	thousand toe	47.9	174	133	346	339
natural gas	million m^3	354	1,391	2,208	2,044	2,157
	thousand toe	330	1,165	1,851	1,783	1,883
technologically captive use	*million m^3*	*292*	*1,120*	*1,771*	*1,696*	*1,685*
	thousand toe	*272*	*938*	*1,486*	*1,492*	*1,488*
of which in combined-cycle units	million m^3	291	1,093	1,753	1,696	1,681
	thousand toe	271	915	1,470	1,492	1,484
non-technologically captive use	*million m^3*	*62.4*	*271*	*437*	*348*	*472*
	thousand toe	*58.1*	*227*	*366*	*291*	*395*
Total	thousand toe	454	1,623	2,313	2,588	2,722
	TJ	19,007	67,961	96,834	108,350	113,948
Various activities	thousand toe	0.072	0	0	0	0.118
Grand total	**thousand toe**	**454**	**1,623**	**2,313**	**2,588**	**2,722**
	TJ	**19,010**	**67,961**	**96,834**	**108,350**	**113,953**

		2007	2008	2009	2010	2011
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	0.304	0	0	0	0
From aqueducts	million m^3	0.024	1.57	2.68	2.83	2.66
Total abstraction from inland waters	**million m^3**	**0.328**	**1.57**	**2.68**	**2.83**	**2.66**
for thermal generation	million m^3	0.328	1.57	2.68	2.83	2.66
EN8 EN21 Open-cycle cooling water						
For thermal generation	million m^3	292	1,368	1,348	1,519	1,556
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0	0.095
EN1 Expendables						
Resins	t	0	6.66	7.50	11.8	35.9
Hydrazine	t	0	12.4	13.4	16.0	15.5
Carbohydrazide	t	0	0.229	0	0	0
Ammonia	t	0	0.786	4.18	5.71	6.26
Sodium hypochlorite	t	0	1,652	2,781	1,823	2,842
Trisodium phosphate	t	0	1.67	3.50	2.57	3.63
Ferric chloride	t	0	2.29	2.54	4.04	5.01
Sulfuric & hydrochloric acids	t	0	1,202	1,886	2,015	2,085
Caustic soda	t	0	991	1,428	1,500	1,617
Lubricating oil	t	0.369	50.9	50.2	51.6	136
Dielectric oil	t	3.20	211	14.3	19.6	14.8
Printing paper	t	0	0	0	0	0.046
Other	t	0	1.48	0.520	0.418	0.619
Total	**t**	**3.57**	**4,132**	**6,191**	**5,450**	**6,762**
for thermal generation	t	0	4,129	6,187	5,447	6,759
for hydro generation	t	0.325	1.45	0.818	0	0.500
for electricity distribution	t	3.24	1.61	3.00	2.50	2.50
EN1 PCB survey						
Oil with PCBs > 500 ppm contained in equipment & transformers	t	na	na	31.5 (1)	0	0

(1) This figure is different from the one published in the Environmental Report 2010. The first year of reporting of this item was 2009 and it referred to oil containing PCBs > 500 ppm, recorded and decontaminated in previous years. However, it is reported here for the sake of completeness.

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**2,165**	**8,321**	**12,024**	**13,016**	**13,556**
fuel oil & gas oil	million kWh	1,138	2,047	1,926	3,558	4,435
natural gas	million kWh	1,027	6,275	10,098	9,458	9,121
of which in combined-cycle units	*million kWh*	*828*	*5,378*	*8,695*	*8,468*	*8,431*
From renewables (hydro from natural flows)	**million kWh**	**620**	**1,300**	**3,782**	**2,975**	**2,404**
Total	**million kWh**	**2,785**	**9,622**	**15,806**	**15,991**	**15,960**
Electricity distribution						
Electricity distributed	million kWh	2,658	12,125	17,899	16,759	19,255
EN4 Electricity consumption for grid operation	million kWh	3.69	14.1	24.4	26.4	27.7

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	0.884	3.84	3.72	5.39	7.36
EN20 NO_X	thermal generation	thousand t	0.943	5.30	7.16	11.4	14.0
EN20 Particulates	thermal generation	thousand t	0.091	0.231	0.161	0.264	0.329
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	1,116	4,185	5,817	6,590	6,950
	various activities	thousand t	0.219	0	0	0	0.345
	Total	**thousand t**	**1,116**	**4,185**	**5,817**	**6,590**	**6,951**
EN16 SF_6	electricity distribution	kg	3.16	15.4	117	45.5	66.3
		thousand t of CO_2 equivalent	0.072	0.352	2.67	1.04	1.51
EN16 Total greenhouse gases (CO_2, SF_6, CH_4) scope 1		thousand t of CO_2 equivalent	1,116	4,186	5,820	6,591	6,952
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows		thousand t	319	654	1,830	1,507	1,233
EN21 **Waste waters (discharged quantity)**	thermal generation	million m^3	0	0.537	0.923	1.09	1.17
EN21 **Conventional polluting load in waste waters discharged by installations**							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	0	0	169	229	175
	in some plants with an overall capacity of	MW	0	0	870	870	798
Total nitrogen (expressed as N)	thermal generation	kg	0	0	536	726	954
	in some plants with an overall capacity of	MW	0	0	870	870	798
Total phosphorus (expressed as P)	thermal generation	kg	0	0	117	118	284
	in some plants with an overall capacity of	MW	0	0	870	870	798
COD	thermal generation	kg	0	0	9,000	44,550	38,635
	in some plants with an overall capacity of	MW	0	0	870	3,194	3,122
BOD	thermal generation	kg	0	0	1,815	2,457	3,518
	in some plants with an overall capacity of	MW	0	0	870	870	798
EN22 **Non-hazardous special waste**							
production	electricity generation	t	146	670	834	1,552	34,037
	electricity distribution	t	78.1	1,401	213	146	406
	various activities	t	0	0	0	0	6.25
	Total	**t**	**224**	**2,071**	**1,048**	**1,699**	**34,449**
delivery to recovery operators	electricity generation	t	0	1.12	2.15	2.33	641
	electricity distribution	t	44.8	763	103	106	406
	Total	**t**	**44.8**	**764**	**105**	**109**	**1,047**
EN22 **Hazardous special waste**							
production	electricity generation	t	170	679	300	329	1,019
	electricity distribution	t	14.1	537	220	63.6	244
	Total	**t**	**184**	**1,216**	**520**	**393**	**1,263**
of which with PCBs	*electricity generation*	*t*	*0*	*35.9*	*49.6*	*62.0*	*48.8*
	electricity distribution	*t*	*0*	*316*	*194*	*56.4*	*198*
	Total	***t***	***0***	***352***	***243***	***118***	***247***

	Source		2007	2008	2009	2010	2011
delivery to recovery operators	electricity generation	t	0	36.2	43.6	43.2	260
	electricity distribution	t	0	128	75.0	20.7	213
	Total	t	0	164	119	63.9	473
of which with PCBs	*electricity generation*	*t*	*0*	*35.9*	*43.4*	*43.0*	*30.3*
	electricity distribution	*t*	*0*	*125*	*73.0*	*20.7*	*167*
	Total	*t*	*0*	*161*	*116*	*63.7*	*197*
EN22 Total special waste							
production	electricity generation	t	316	1,349	1,135	1,882	35,056
	electricity distribution	t	92.2	1,938	433	210	650
	various activities	t	0	0	0	0	6.25
	Total	**t**	**408**	**3,287**	**1,568**	**2,091**	**35,712**
delivery to recovery operators	electricity generation	t	0	37.3	45.8	45.5	901
	electricity distribution	t	44.8	891	178	127	618
	Total	**t**	**44.8**	**928**	**224**	**172**	**1,520**

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	45.1	44.9	45.5	45.5	45.3	0.400	-0.400
underground	% of entire LV grid	37.5	37.6	37.6	37.8	37.7	0.500	-0.300
Total cable lines	**% of entire LV grid**	**82.7**	**82.5**	**83.2**	**83.2**	**83.1**	**0.500**	**-0.100**
MV cable lines								
overhead	% of entire MV grid	0.687	1.37	1.69	1.68	1.66	141	-1.20
underground	% of entire MV grid	54.7	54.2	54.5	54.7	54.8	0.200	0.200
Total cable lines	**% of entire MV grid**	**55.4**	**55.6**	**56.2**	**56.3**	**56.5**	**2.00**	**0.400**
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	73.3	73.1	73.7	73.7	73.6	0.400	-0.100
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	2,097	1,951	1,924	1,988	2,008	-4.20	1.00
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.139	0.117	0.136	0.157	0.144	3.60	-8.30
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.151	0.189	0.223	0.217	0.196	29.8	-9.70
excluding contribution of as-is sea water	liters/kWh	0.151	0.189	0.223	0.217	0.196	29.8	-9.70
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	92.7	0	0	0	0	-100	0
from aqueducts	% of requirements	7.32	100	100	100	100	1,266	0
Total from inland waters	**% of requirements**	**100**	**100**	**100**	**100**	**100**	**0**	**0**

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	16.8	17.5	14.2	17.7	18.4	9.50	4.00
gas oil	% of total fuel consumption	10.6	10.7	5.77	13.4	12.5	17.9	-6.70
natural gas	% of total fuel consumption	72.7	71.8	80.0	68.9	69.2	-4.80	0.400
LS fuel oil	% of total fuel oil consumption	100	100	100	100	100	0	0
natural gas, technologically captive use	% of total natural gas consumption	82.4	80.5	80.2	83.7	79.0	-4.10	-5.60
of which in combined-cycle units	*% of total natural gas consumption*	*82.0*	*78.6*	*79.4*	*83.7*	*78.8*	*-3.90*	*-5.90*
natural gas, non-technologically captive use	% of total natural gas consumption	17.6	19.5	19.8	16.3	21.0	19.3	28.8
Electricity generation from renewables								
hydro from natural flows	% of total generation	22.2	13.5	23.9	18.6	15.1	-32.0	-18.8
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	0.408	0.462	0.309	0.414	0.543	33.1	31.2
EN20 NO_X (thermal generation)	g/kWh thermal net	0.436	0.636	0.596	0.879	1.04	138	18.3
EN20 Particulates (thermal generation)	g/kWh thermal net	0.042	0.028	0.013	0.020	0.024	-42.9	20.0
EN16 CO_2 (thermal generation)	g/kWh thermal net	515	503	484	506	513	-0.400	1.40
EN20 SO_2 (total from thermal generation)	g/kWh total net	0.317	0.399	0.235	0.337	0.461	45.4	36.8
EN20 NO_X (total from thermal generation)	g/kWh total net	0.339	0.55	0.453	0.715	0.879	159	22.9
EN20 Particulates (total from thermal generation)	g/kWh total net	0.033	0.024	0.010	0.017	0.021	-36.4	23.5
EN16 CO_2 (total from thermal generation)	g/kWh total net	401	435	368	412	435	8.50	5.60
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.056	0.200	0.729	0.344	0.497	787	44.5
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	0.045	0.034	0	-24.4
Total nitrogen (expressed as N)	mg/kWh thermal net	0	0	0	0.143	0.185	0	29.4
Total phosphorus (expressed as P)	mg/kWh thermal net	0	0	0	0.023	0.055	0	139
COD	mg/kWh thermal net	0	0	0	3.41	2.85	0	-16.4
BOD	mg/kWh thermal net	0	0	0	0.485	0.684	0	41.0
EN22 **Waste recovery**								
Other non-hazardous special waste								
electricity generation	% of production	0	0.167	0.257	0.150	1.88	0	1,153
electricity distribution	% of production	57.3	54.5	48.3	72.6	100	74.5	37.7
Total	**% of production**	**20.0**	**36.9**	**10.0**	**6.39**	**3.04**	**-84.8**	**-52.4**
Other hazardous special waste								
electricity generation	% of production	0	5.33	14.5	13.1	25.5	0	94.7
electricity distribution	% of production	0	23.8	34.1	32.6	87.1	0	167
Total	**% of production**	**0**	**13.5**	**22.8**	**16.3**	**37.4**	**0**	**129**
Total special waste								
electricity generation	% of production	0	2.77	4.03	2.42	2.57	0	6.20
electricity distribution	% of production	48.5	46.0	41.1	60.5	95.2	96.3	57.4
Total	**% of production**	**11.0**	**28.2**	**14.3**	**8.25**	**4.26**	**-61.3**	**-48.4**

Highlights of 2011

EN1 EN3 The fuel mix changed in favor of oil (+~0.7 percentage points) and natural gas (+~0.27 percentage points) to the expense of gas oil (-~1 percentage point). The contribution of renewables to total generation in 2011 fell by 500 GW, in spite of a constant generation value (about 16 TWh).

EN8 Net specific requirements of water for industrial uses in thermal generation were down by about 10%. Owing to the change in the fuel mix:

EN16 net specific emissions of CO_2 from total electricity generation were up by 6.5 g/kWh (+1.2%);

EN20 net specific emissions of macro-pollutants from simple thermal generation alone were up by about 31% (SO_2), about 18% (NO_X) and about 20% (particulates);

EN18 CO_2 emissions displaced by hydro generation amounted to roughly 1.2 million tonnes (about 18% less than in the previous year) owing to lower generation.

EN19 Ozone-depleting substances.

Freon

Emission: 144 kg equivalent to 115.2 kg of CFC11, determined on the basis of gas replenishments of air conditioning systems.

EN22 The high value of non-hazardous waste production in 2011 was affected by the removal of sludges by dredging, an activity which was not present in previous years.

In Argentina, Enel operates through Endesa (thermal and hydro power generation, electricity distribution and sales).

EN26 Environmental enhancements.

Water

> Power plants: water consumption monitoring and management systems are in place.

Emissions

> Buenos Aires thermal plant: a system injecting water into combustion chambers was developed to hold down NO_X.

Noise

> Edesur, electricity distribution: particularly noisy high-voltage transformer fans were replaced.

> Silencers are being installed in steam-fired plants to mitigate noise peaks.

Renewables

> The opportunity to use biodiesel in some thermal plants is being investigated.

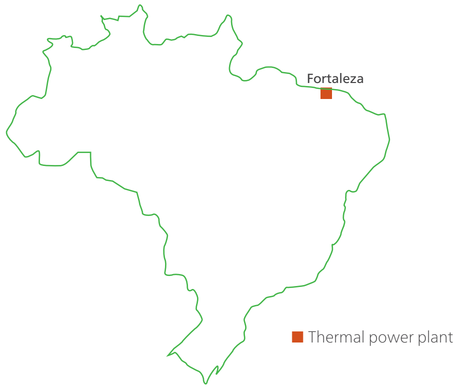
Other

> Edesur, electricity distribution: an internal and external awareness campaign is being conducted with a view to saving energy and water and improving waste management.

Brazil

Thermal power generation

Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
1	317	1,033

Power installations

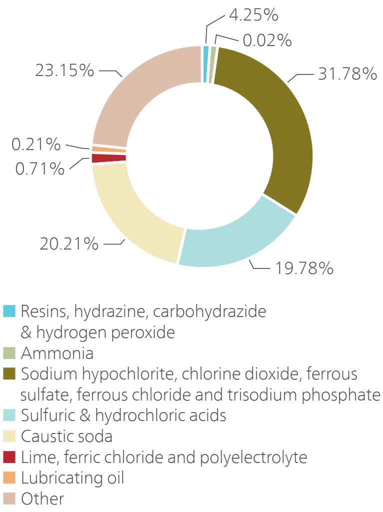
	Power plants no.	Units no.	Net maximum electrical capacity MW
Combined-cycle gas turbines	**1**	**3**	**317**

The Fortaleza power plant has an ISO 14001-certified environmental management system.

Net electricity generation
Total: 1,033 million kWh

Fuel consumption
Total:187,230 t of oil equivalent

Expendables
Total: 93 t



Emissions into the atmosphere

NO_X: **233 t**
CO_2: **357,800 t**

Water for industrial uses
Total requirements: 1,275,710 m^3
Total abstraction from inland waters: 1,275,710 m^3

Waste waters
Discharged: 199,280 m^3

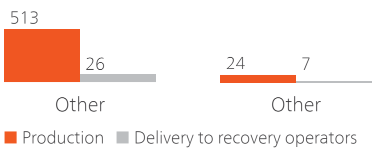
Waste waters include those meteoric waters that are susceptible to pollution and are therefore fed to treatment systems before being discharged or used.

Special waste

Total production: **537 t**
Total delivery to recovery operators: **33 t**

Non-hazardous
Production: 513 t
Delivery to recovery operators: 26 t

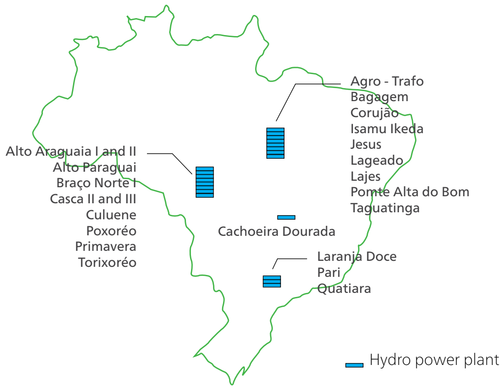
Hazardous
Production: 24 t
Delivery to recovery operators: 7 t



Brazil

Hydro power generation

Endesa SA
Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
21	749	3,658

Power installations

	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	**21**	**30**	**749**

The hydro power plant of Cachoeira Dourada is ISO 14001-certified.

Equivalent yearly hours of utilization*

Hydro: **4,886 hours**

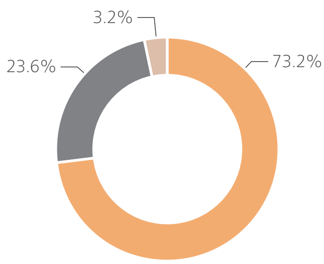
* Yearly generation/capacity ratio. For Endesa generation is considered to refer to the entire year.

Gas oil

Total consumption: **164 toe**

Expendables

Total: 31 t



Net electricity generation

Total: **3,658 million kWh**

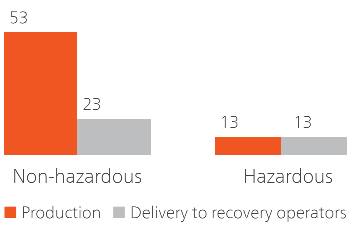
Avoided CO_2 emissions

Due to hydro generation from natural flows: **1,266,431 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Special waste

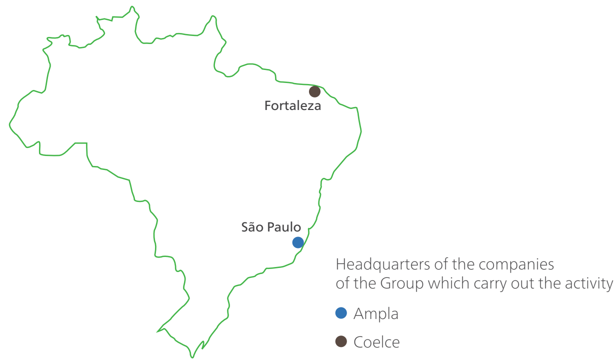
Total production: **66 t**
Total delivery to recovery operators: **36 t**



Brazil

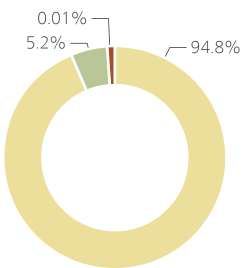
Electricity distribution

Endesa SA



The Numbers

Substations	Capacity (MVA)	Total lines (km)
235,763	13,845	184,688



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	215	6,858
MV/LV	235,548	6,987
	235,763	**13,845**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	8,273	-	0	**8,273**
MV	112,778	57	6	**112,841**
LV	54,044	9,511	19	**63,575**
	175,095	**9,568**	**26**	**184,688**

The organization has an ISO 14001-certified environmental management system in place.

General data

Municipalities served: **251**

Surface area served: **181,440 km^2**

Customers connected to the grid: **5,867,888** (of which supplied by companies of the Group: **5,867,817**)

Resource consumption

Expendables: **313 t**

Electricity

Total electricity distributed: **19,193 million kWh**

Own consumption for grid operation: **35 million kWh**

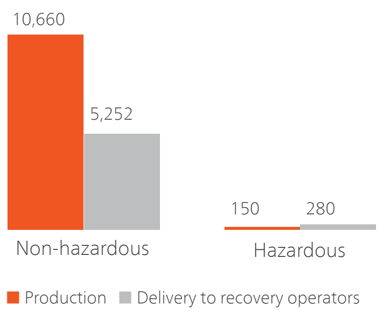
Emissions into the atmosphere

SF_6: **34 kg** (748 t of CO_2 equivalent)

Special waste

Total production: **10,810 t**

Total delivery to recovery operators: **5,532 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	22	22	22	22	22
thermal	no.	1	1	1	1	1
hydro	no.	21	21	21	21	21
Net maximum electrical capacity	MW	751	754	1,064	1,050	1,066
thermal	MW	216	216	313	307	317
hydro	MW	535	539	752	743	749
Power lines (circuit-length)						
Total	km	111,137	111,137	176,404	180,389	184,688
high-voltage	km	4,410	4,410	8,081	8,120	8,273
medium-voltage	km	67,032	67,032	106,881	109,810	112,841
low-voltage	km	39,695	39,695	61,443	62,458	63,575
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.	0	0	0	0	584
Gross real-estate surface area	thousand m^2	0	0	0	0	38,462

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
gas oil	thousand t	0	0.001	0.001	0	0
	thousand toe	0	0	0.001	0	0
natural gas	million m^3	0.513	11.7	108	344	218
	thousand toe	0.478	10.1	91.1	293	187
technologically captive use	*million m^3*	*0.513*	*11.7*	*108*	*344*	*218*
	thousand toe	*0.478*	*10.1*	*91.1*	*293*	*187*
of which in combined-cycle units	million m^3	0.513	11.7	108	344	218
	thousand toe	0.478	10.1	91.1	293	187
Total	thousand toe	0.478	10.1	91.1	293	187
	TJ	20.0	422	3,814	12,280	7,839
Real-estate & service management	thousand toe	0.357	0.001	0.001	0.002	1.35
Grand total	thousand toe	0.835	10.1	91.1	293	189
	TJ	35.0	422	3,814	12,280	7,895
EN4 **Primary electricity**						
Real-estate & service management	million kWh	0	0	0	0	21.6
EN8 **Water for industrial uses**						
From rivers (including meteoric waters from secondary rainfall)	million m^3	0.003	0.138	0.665	2.21	1.28
for thermal generation	million m^3	0.003	0.138	0.665	2.21	1.28

		2007	2008	2009	2010	2011
EN8 EN21 Open-cycle cooling water						
For thermal generation (simple and CHP)	million m^3	0	122	0	0	0
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0	0.098
EN1 Expendables						
Resins	t	0	0	3.80	0	3.80
Hydrazine	t	0	0	0.232	0.237	0.108
Carbohydrazide	t	0	0	0.050	0.237	0.060
Ammonia	t	0	0	0.170	0.172	0.023
Sodium hypochlorite	t	0	27.5	16.1	40.8	21.4
Ferrous sulfate	t	0	0	0	11.2	8.04
Trisodium phosphate	t	0	0.050	0.292	0.547	0.236
Polyelectrolyte	t	0	0.166	0.260	1.01	0.669
Sulfuric & hydrochloric acids	t	0	23.6	17.0	21.5	18.4
Caustic soda	t	0	20.3	23.3	25.6	18.9
Lubricating oil	t	11.4	42.6	20.8	20.5	23.2
Dielectric oil	t	22.9	89.4	217	526	320
Printing paper	t	0	0	0	0	47.1
Other	t	0	3.16	2.00	41.0	22.6
Total	**t**	**34.3**	**207**	**301**	**689**	**485**
for thermal generation	t	0	72.1	61.5	141	93.3
for hydro generation	t	21.4	26.6	24.0	21.6	31.4
for electricity distribution	t	12.9	108	216	526	313
EN1 PCB survey						
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t	0	0	0	48.5	340
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t	0	0	0	7.16	13.2

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**2.40**	**54.3**	**500**	**1,665**	**1,033**
fuel oil & gas oil	million kWh	0	0	0.002	0	0
natural gas	million kWh	2.40	54.3	500	1,665	1,033
of which in combined-cycle units	*million kWh*	*2.40*	*54.3*	*500*	*1,665*	*1,033*
From renewables (hydro from natural flows)	**million kWh**	**1,128**	**2,726**	**3,369**	**3,950**	**3,658**
Total	**million kWh**	**1,131**	**2,781**	**3,869**	**5,615**	**4,691**
Electricity distribution						
Electricity distributed	million kWh	3,000	13,413	17,254	18,777	19,183
EN4 Electricity consumption for grid operation	million kWh	3.19	0	11.0	34.6	34.6

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 NO_X	thermal generation	thousand t	0	0.011	0.192	0.190	0.233
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	0.986	18.9	177	563	358
	various activities	thousand t	1.09	0.763	0	0.013	3.27
	Total	**thousand t**	**2.08**	**19.6**	**177**	**563**	**361**
EN16 SF_6	electricity generation	kg	0	0	4.00	6.00	0
		thousand t of CO_2 equivalent	0	0	0.091	0.137	0
	electricity distribution	kg	21.8	60.9	94.8	97.5	33.7
		thousand t of CO_2 equivalent	0.497	1.39	2.16	2.22	0.768
	Total	**kg**	**21.8**	**60.9**	**98.8**	**104**	**33.7**
		thousand t of CO_2 equivalent	**0.497**	**1.39**	**2.25**	**2.36**	**0.768**
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		thousand t of CO_2 equivalent	2.57	21.0	179	565	362
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	463	947	1,193	1,336	1,266
EN21 Waste waters (discharged quantity)	thermal generation	million m^3	0	0.053	0.175	0.415	0.199
EN21 Conventional polluting load in waste waters discharged by installations							
Total nitrogen (expressed as N)	thermal generation	kg	0	0	75.3	373	179
	in some plants with an overall capacity of	MW	0	0	322	322	322
COD	thermal generation	kg	0	0	68.8	43,763	20,660
	in some plants with an overall capacity of	MW	0	0	322	322	322
BOD	thermal generation	kg	0	0	55.3	24,230	9,607
	in some plants with an overall capacity of	MW	0	0	322	322	322
EN22 Non-hazardous special waste							
production	electricity generation	t	149	153	196	645	566
	electricity distribution	t	896	431	2,052	5,852	10,660
	Total	**t**	**1,046**	**584**	**2,248**	**6,497**	**11,226**
delivery to recovery operators	electricity generation	t	7.65	6.47	114	6.32	49.3
	electricity distribution	t	0	318	2,700	5,629	5,252
	Total	**t**	**7.65**	**325**	**2,814**	**5,636**	**5,301**
EN22 Hazardous special waste							
production	electricity generation	t	9.26	33.3	9.21	20.5	37.5
	electricity distribution	t	54.1	173	619	1,111	150
	various activities	t	0	0	0	0	456
	Total	**t**	**63.3**	**207**	**629**	**1,132**	**643**
of which with PCBs	*electricity generation*	*t*	*0*	*6.16*	*6.35*	*1.08*	*5.64*
	electricity distribution	*t*	*18.8*	*82.2*	*204*	*364*	*25.2*
	Total	***t***	***18.8***	***88.4***	***210***	***365***	***30.9***
delivery to recovery operators	electricity generation	t	4.10	17.2	11.3	0.430	19.4
	electricity distribution	t	18.8	82.2	143	1,111	280
	Total	**t**	**22.9**	**99.4**	**155**	**1,112**	**299**
of which with PCBs	*electricity generation*	*t*	*0*	*6.16*	*2.92*	*0*	*5.64*
	electricity distribution	*t*	*18.8*	*82.2*	*3.86*	*364*	*25.2*
	Total	***t***	***18.8***	***88.4***	***6.78***	***364***	***30.9***
EN22 Total special waste							
production	electricity generation	t	159	187	205	665	603
	electricity distribution	t	951	604	2,671	6,964	10,810
	various activities	t	0	0	0	0	456
	Total	**t**	**1,109**	**790**	**2,877**	**7,629**	**11,869**
delivery to recovery operators	electricity generation	t	11.8	23.7	125	6.75	68.7
	electricity distribution	t	18.8	400	2,844	6,741	5,532
	Total	**t**	**30.5**	**424**	**2,969**	**6,747**	**5,600**

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	15.1	15.1	15.3	15.2	15.0	-0.700	-1.30
underground	% of entire LV grid	0.043	0.043	0.093	0.049	0.030	-30.2	-38.8
Total cable lines	**% of entire LV grid**	**15.2**	**15.2**	**15.4**	**15.2**	**15.0**	**-1.30**	**-1.30**
MV cable lines								
overhead	% of entire MV grid	0.965	0.965	0.951	0.941	0.050	-94.8	-94.7
underground	% of entire MV grid	0.052	0.052	0.055	0.056	0.005	-90.4	-91.1
Total cable lines	**% of entire MV grid**	**1.02**	**1.02**	**1.01**	**0.997**	**0.055**	**-94.6**	**-94.5**
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	6.04	6.04	6.00	5.91	5.19	-14.1	-12.2
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	1,988	1,855	1,823	1,762	1,812	-8.90	2.80
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.106	0	0.064	0.184	0.038	-64.2	-79.3
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	1.25	2.54	1.33	1.33	1.24	-0.800	-6.80
excluding contribution of as-is sea water	liters/kWh	1.25	2.54	1.33	1.33	1.24	-0.800	-6.80
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	100	100	100	100	100	0	0
EN1 EN3 Fossil fuel consumption for thermal generation								
gas oil	% of total fuel consumption	0	0	0.001	0	0	0	0
natural gas	% of total fuel consumption	100	100	100	100	100	0	0
natural gas, technologically captive use	% of total natural gas consumption	100	100	100	100	100	0	0
of which in combined-cycle units	*% of total natural gas consumption*	*100*	*100*	*100*	*100*	*100*	*0*	*0*
Electricity generation from renewables								
hydro from natural flows	% of total generation	99.8	98.0	87.1	70.3	78.0	-21.8	11.0
Specific emissions into the atmosphere								
EN20 NO_X (thermal generation)	g/kWh thermal net	0	0.203	0.384	0.114	0.225	0	97.4
EN16 CO_2 (thermal generation)	g/kWh thermal net	410	347	354	338	346	-15.6	2.40
EN20 NO_X (total from thermal generation)	g/kWh total net	0	0.004	0.050	0.034	0.050	0	47.1
EN16 CO_2 (total from thermal generation)	g/kWh total net	0.872	6.78	45.7	100	76.3	8,650	-23.7
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	2.53	4.56	3.05	1.89	1.08	-57.3	-42.9
Net specific conventional pollutant load of waste waters discharged by plants (thermal generation)								
Total nitrogen (expressed as N)	mg/kWh thermal net	0	0	0	0.218	0.172	0	-21.1
COD	mg/kWh thermal net	0	0	0	25.6	19.8	0	-22.7
BOD	mg/kWh thermal net	0	0	0	14.2	9.21	0	-35.1

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 Waste recovery								
Other non-hazardous special waste								
electricity generation & geothermal drilling	% of production	5.12	4.23	58.1	0.980	8.72	70.3	789
electricity distribution	% of production	0	73.9	132	96.2	49.3	0	-48.8
Total	**% of production**	**0.732**	**55.6**	**125**	**86.7**	**47.2**	**6,348**	**-45.6**
Other hazardous special waste								
electricity generation	% of production	44.3	51.7	123	2.10	51.7	16.7	2,361
electricity distribution	% of production	34.7	47.5	23.1	100	187	438	87.0
Total	**% of production**	**36.1**	**48.1**	**24.6**	**98.2**	**160**	**343**	**62.9**
Total special waste								
electricity generation	% of production	7.4	12.7	61.0	1.01	11.4	54.1	1,028
electricity distribution	% of production	1.98	66.3	106	96.8	51.2	2,485	-47.1
Total	**% of production**	**2.75**	**53.6**	**103**	**88.4**	**49.1**	**1,685**	**-44.5**

Highlights of 2011

EN1 EN3 The net heat rate of thermal generation was up by ~3% owing to lower generation in the CCGT plant of Fortaleza (the only thermal plant). The efficiency of the plant fell from 51% to about 49% owing to its irregular operation.

Overall generation was down by about 1.3 TWh (the reduction was more significant for thermal generation than for hydro generation).

EN5 EN6 EN18 In the 2011 "New Energy" public procurement tender in Brazil, Enel Green Power won contracts of supply of electricity by submitting three wind farm projects (total installed capacity: 193 MW). The projects are located in the north-eastern region of the country (States of Bahia, Pernambuco and Rio Grande do Norte). The plants are scheduled to be commissioned in 2014.

EN8 Net specific requirements of water for industrial uses in thermal generation were down by about 7%.

In Brazil, Enel operates through Endesa (thermal and hydro power generation, electricity distribution and sales) and Enel Green Power (hydro power generation).

Owing to irregular operation and lower efficiency of the CCGT plant of Fortaleza:

EN16 net specific emissions of CO_2 from thermal generation increased by 8 g/kWh (+~2.4%);

EN20 net specific emissions of NO_X were up by ~97%.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to roughly 1.3 million tonnes.

EN19 Ozone-depleting substances:

R22

Emission: **149 kg equivalent to 8.2 kg of CFC11**, determined on the basis of gas replenishments in air conditioning systems. Furthermore, the program of replacement of household appliances and low-efficiency refrigerators, launched by the electricity distribution companies (Ampla and Coelce) makes it possible to eliminate ozone-depleting substances at the customers' premises.

EN26 Environmental enhancements.

Water

- Electricity generation and distribution (Ampla): as part of environmental management systems, awareness campaigns were conducted with a view to cutting water consumption in various processes, installations and offices.

Emissions

- Electricity distribution (Ampla and Coelce): every year, exhaust gases from transport vehicles are measured; the vehicles exceeding the applicable limits are overhauled and repaired. The companies verify the emissions generated by suppliers and keep the greenhouse gas inventory updated: SF_6-containing equipment is checked for leaks on a weekly basis so as to prevent releases into the atmosphere.

Noise

- Electricity distribution (Ampla and Coelce): substation-noise monitoring surveys are carried out at least once in the period of validity of the environmental permit. Results confirm compliance with the applicable limits.
- Electricity generation: compliance of all power plants with the applicable limits was checked.

Waste

- Ecoelce project: the project follows up an investigation conducted on 184 low-income communities in the metropolitan area of Fortaleza. The investigation evidenced: improper disposal of garbage into the environment and high levels of insolvency in bill payment and thefts of electricity, with consequent inefficient use and increased consumption. To redress the situation while safeguarding the environment, Coelce put in place a scheme encouraging inhabitants to return recyclable municipal waste in exchange for discounts on their electricity bills; the collected materials are delivered to recovery operators. Customers joining the scheme receive a card to be presented whenever they bring their waste to one of the special collection centers; here, through an appropriate information system, assistants record the delivered waste and the customer's credit (determined on the basis of the current value of the delivered materials) on the card and issue a receipt. At the end of the electricity invoicing period, Coelce issues an already discounted bill or a credit memo to the customer.

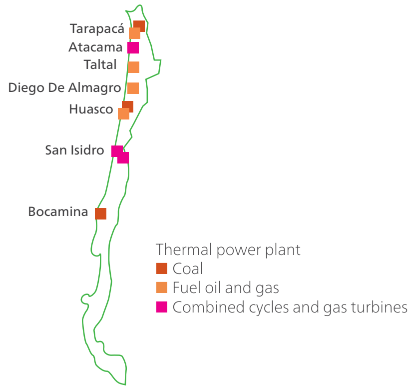
Other

- Electricity distribution (Coelce): the company organizes energy-saving campaigns and awareness/training events for its personnel members and suppliers on how to manage the environmental aspects of their activities: waste, oils, SF_6, hazardous substances and other impacts. All the centers of the company have an environmental team trained on emergency response.
- Electricity distribution (Coelce): the company conducted a study on electro-magnetic fields from substations and transmission lines; the study indicated that emission levels comply with the applicable legislation.
- Electricity distribution (Coelce): for new medium-voltage lines, the company is introducing twisted cables, which reduce the need for cutting vegetation and mitigate the visual impact.
- Hydro power plants (Enel Green Power): construction of hazardous-substance storage systems equipped with spill containment vats.
- Hydro power plants (Enel Green Power): scheme aimed at building awareness of environmental protection, conservation of species and ecosystems, prohibition of hunting and excessive fishing; the scheme is intended for people living near the plants, employees and contractors.

Chile

Thermal power generation

Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
10	2,021	8,674

Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW
Steam (condensing)	2	2	279
Combined-cycle gas turbines	3	10	1,142
Single-cycle gas turbines	5	9	600
	10	**21**	**2,021**

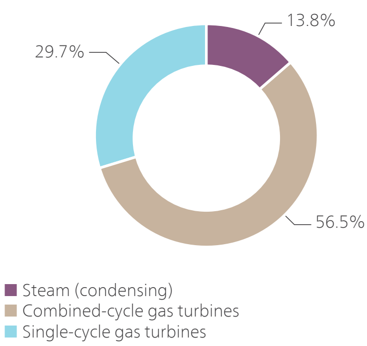
The thermal power plants of Atacama, Bocamina, San Isidro, Taltal, Tarapacá Vapor and Tarapacá, totaling 2,067 MW, are ISO 14001-certified.

Net electricity generation

Total: 8,674 million kWh

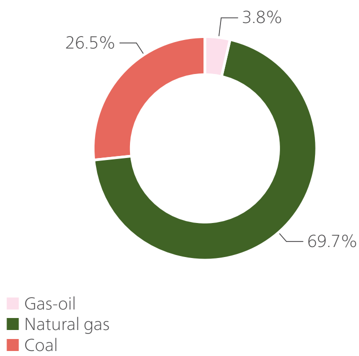
Net maximum electrical capacity

Total: 2,021 MW



Fuel consumption

Total: 1,616,323 t of oil-equivalent



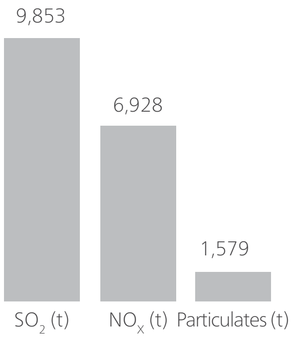
Waste waters

2,596,054 m^3

Discharged

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

Emissions into the atmosphere



CO_2: **4,598,625 t**

Special waste

Total production: **83,581 t**

Total delivery to recovery operators: **27 t**

Non-hazardous

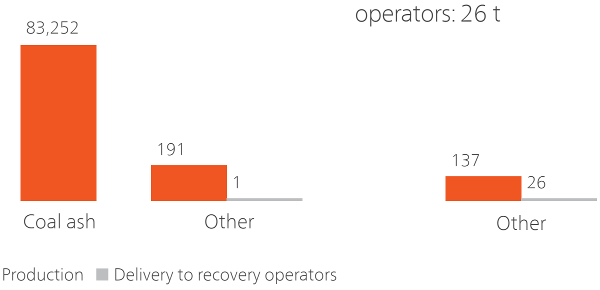
Production: 83,444 t

Delivery to recovery operators: 1 t

Hazardous

Production: 137 t

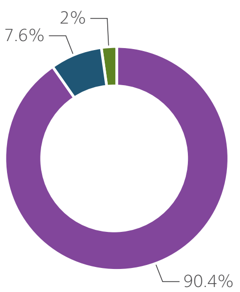
Delivery to recovery operators: 26 t



Water for industrial uses

Total requirements: 7,136,814 m3

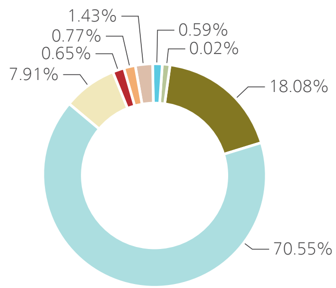
Total abstraction from inland waters: 6,453,630 m3



- From wells
- From the sea (desalinated)
- From waste waters (used inside plants)

Expendables

Total: 1,369 t

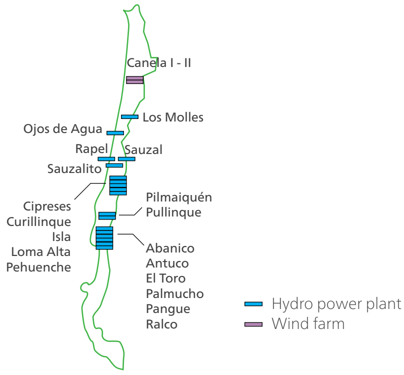


- Resins, hydrazine, carbohydrazide & hydrogen peroxide
- Ammonia
- Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate
- Sulfuric & hydrochloric acids
- Caustic soda
- Lime, ferric chloride and polyelectrolyte
- Lubricating oil
- Other

Chile

Hydro and wind power generation

Endesa SA
Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
20	2,626	12,476

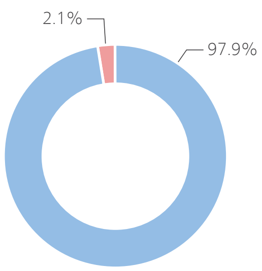
Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	11	19	854
Pondage/reservoir	7	19	2,694
	18	**38**	**3,548**

WIND	Power plants no.	Net maximum electrical capacity MW
	2	**78**

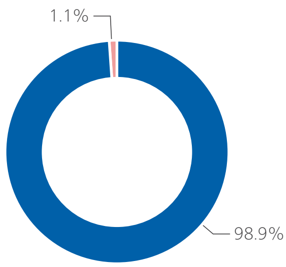
The power plants of Abanico, Antuco, Canela I, Cipreses, Curillinque, El Toro, Isla, Loma Alta, Los Molles, Ojos de Agua, Palmucho, Pangue, Pehuenche, Ralco, Rapel, Sauzal and Sauzalito (3,534 MW) are ISO 14001-certified.

Net maximum electrical capacity
Total: 2,626 MW



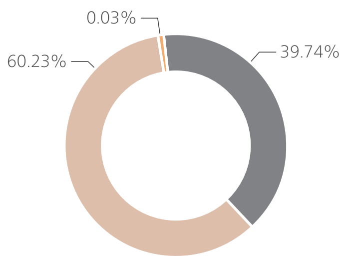
Hydro
Wind

Net electricity generation
Total: 12,476 million kWh



Hydro from natural flows
Wind

Expendables
Total: 51 t



Lubricating oil
Dielectric oil
Other

Equivalent yearly hours of utilization*

3,479 hydro

1,691 wind

* Yearly generation/capacity ratio (excluding hydro from pumped storage).

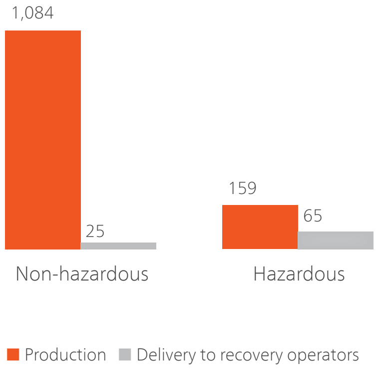
Avoided CO_2 emissions (t)

Due to hydro generation from natural flows	6,544,169
Due to wind generation	69,931
Total	**6,614,100**

Emissions from the otherwise necessary fossil-fired thermal generation.
The contribution of geothermal generation has been calculated on the assumption that the related CO_2 emissions are of natural origin.

Special waste

Total production: **1,243 t**
Total delivery to recovery operators: **90 t**



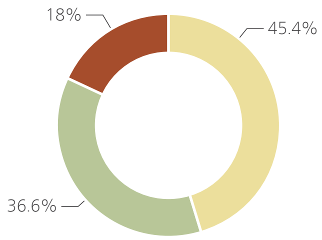
Chile

Electricity distribution

Endesa SA

The Numbers

Substations	Capacity (MVA)	Total lines (km)
22,376	10,828	15,824



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	50	6,993
MV/LV	22,323	3,805
MV/MV	3	30
	22,376	**10,828**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	344	-	11	**355**
MV	2,847	1,201	946	**4,993**
LV	3,992	4,597	1,887	**10,476**
	7,183	**5,798**	**2,844**	**15,824**

The organization has an ISO 14001-certified environmental management system in place.

General data

Municipalities served: **33**
Surface area served: **2,118 km²**
Customers connected to the grid: **1,637,979** (of which supplied by companies of the Group: **1,637,977**)

Emissions into the atmosphere

SF_6: **13 kg (296 t of CO_{2eq})**

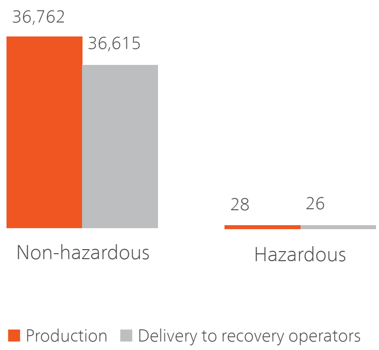
Electricity

Total electricity distributed: **13,697 million kWh**

Own consumption for grid operation: **12 million kWh**

Special waste

Total production: **36,642 t**
Total delivery to recovery operators: **36,788 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	26	13	30	30	30
thermal	no.	10	10	10	10	10
hydro	no.	16	2	18	18	18
wind	no.	-	1	2	2	2
Net maximum electrical capacity	MW	3,614	3,632	5,461	5,679	5,647
thermal	MW	1,210	1,210	1,850	2,067	2,021
hydro	MW	2,404	2,410	3,534	3,535	3,548
wind	MW	0	12.2	77.2	77.0	78.0
Power lines (circuit-length)						
Total	km	10,206	10,049	15,155	15,155	15,824
high-voltage	km	246	238	355	355	355
medium-voltage	km	3,280	3,202	4,828	4,828	4,993
low-voltage	km	6,680	6,610	9,972	9,972	10,476
EN29 **Real-estate & service management** (1)						
Vehicle fleet						
service vehicles	no.				8	324
special vehicles	no.				2	2
vehicles for both private and service use	no.				3	9
Gross real-estate surface area	thousand m^2				0.388	51.1

(1) The survey started in 2010.

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
fuel oil	thousand t	0.103	42.6	11.2	0.090	0.696
	thousand toe	0.099	39.8	10.9	0.089	0.691
MS	*thousand t*	*0*	*0*	*0.004*	*0*	*0*
	thousand toe	*0*	*0*	*0.004*	*0*	*0*
LS	*thousand t*	*0.103*	*42.6*	*9.69*	*0*	*0*
	thousand toe	*0.099*	*39.8*	*9.40*	*0*	*0*
VLS	*thousand t*	*0*	*0*	*1.51*	*0.090*	*0.696*
	thousand toe	*0*	*0*	*1.50*	*0.089*	*0.691*
gas oil	thousand t	177	615	650	196	62.5
	thousand toe	179	560	674	199	60.7
natural gas	million m^3	48.4	140	366	1,192	1,320
	thousand toe	45.1	115	360	1,015	1,126
technologically captive use	*million m^3*	*48.4*	*140*	*366*	*1,192*	*1,320*
	thousand toe	*45.1*	*115*	*360*	*1,015*	*1,126*
of which in combined-cycle units	million m^3	36.1	121	288	1,098	1,240
	thousand toe	33.6	99.0	297	935	1,054
non-technologically captive use	*million m^3*	*0*	*0*	*0*	*0*	*0.079*
	thousand toe	*0*	*0*	*0*	*0.042*	*0.090*

		2007	2008	2009	2010	2011
coal	thousand t	131	510	756	476	718
	thousand toe	83.8	293	434	287	429
Total	**thousand toe**	**308**	**1,007**	**1,479**	**1,501**	**1,616**
	TJ	**12,915**	**42,163**	**61,935**	**62,863**	**67,672**
Real-estate & service management	thousand toe	0.004	0	0.002	0.027	0.529
Grand total	**thousand toe**	**308**	**1,007**	**1,479**	**1,501**	**1,617**
	TJ	**12,915**	**42,163**	**61,935**	**62,864**	**67,694**
EN4 **Primary electricity**						
Real-estate & service management	million kWh	0	0	0	0.142	17.5
EN8 **Water for industrial uses**						
From wells	million m^3	0.116	3.01	2.64	6.29	6.45
From aqueducts	million m^3	0.020	0	0.157	0	0
Total abstraction from inland waters	**million m^3**	**0.136**	**3.01**	**2.79**	**6.29**	**6.45**
From the sea (desalinated)	million m^3	0	0.373	0.587	0.598	0.543
EN10 From waste waters (used inside plants)	million m^3	0	0	0	0	0.140
Total requirements	**million m^3**	**0.136**	**3.39**	**3.38**	**6.89**	**7.14**
for thermal generation	million m^3	0.136	3.39	3.38	6.89	7.14
EN8 EN21 **Open-cycle cooling water**						
For thermal generation	million m^3	125	327	928	414	526
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0.717	0.132
EN1 **Expendables**						
Resins	t	0	3.89	0.208	0	0
Hydrazine	t	0.366	5.56	3.31	7.65	8.13
Ammonia	t	0.017	1.81	0.827	0.474	0.328
Sodium hypochlorite	t	94.5	287	301	227	198
Ferrous sulfate	t	10.2	42.0	65.1	10.5	47.9
Trisodium phosphate	t	0.162	1.37	1.65	1.15	1.35
Lime	t	0.201	0.778	3.64	1.86	1.53
Ferric chloride	t	1.34	15.4	10.4	9.19	6.96
Polyelectrolyte	t	0	0.304	0.678	0.636	0.395
Sulfuric & hydrochloric acids	t	86.7	499	596	858	966
Caustic soda	t	32.7	212	253	110	108
Lubricating oil	t	0.365	10.7	27.7	69.0	30.9
Dielectric oil	t	0.073	3.49	357	11.9	60.0
Printing paper	t	0	0	0	0.412	2.35
Other	t	0.220	22.4	7.23	24.5	19.6
Total	**t**	**227**	**1,105**	**1,626**	**1,333**	**1,452**
for thermal generation	t	226	1,095	1,260	1,279	1,369
for hydro generation	t	0.501	9.70	365	47.4	50.9
for wind generation	t	0	0	0.465	3.77	0.612
for electricity distribution	t	0	1.17	0	2.18	29.0
EN1 **PCB survey**						
Equipment & transformers with PCBs > 500 ppm (excluding their oil)	t	0	0	0.060	0	0.060
Oil with PCBs > 500 ppm contained in equipment & transformers	t	0	0	0	0.060	0
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t	0	0	5.79	3.72	0
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t	0	0	5.21	1.48	0

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**1,230**	**4,997**	**7,297**	**8,146**	**8,674**
fuel oil & gas oil	million kWh	726	3,114	3,282	1,034	224
natural gas	million kWh	202	687	2,189	5,890	6,630
of which in combined-cycle units	*million kWh*	*167*	*619*	*2,016*	*5,603*	*6,386*
coal	million kWh	302	1,196	1,826	1,221	1,820
From renewables	**million kWh**	**2,411**	**9,712**	**15,332**	**13,227**	**12,476**
hydro from natural flows	million kWh	2,411	9,691	15,275	13,084	12,344
wind	million kWh	0	20.4	57.0	143	132
Hydro from pumped storage	**million kWh**	**0**	**0**	**2.26**	**0**	**0**
Total	**million kWh**	**3,640**	**14,708**	**22,632**	**21,373**	**21,150**
Electricity distribution						
Electricity distributed	million kWh	2,076	8,937	12,585	13,098	13,676
EN4 Electricity consumption for grid operation	million kWh	2.01	0	12.0	7.86	11.6

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	2.60	10.5	10.9	7.36	9.85
EN20 NO_X	thermal generation	thousand t	1.67	7.49	8.45	6.57	6.93
EN20 Particulates	thermal generation	thousand t	0.974	0.531	1.14	1.32	1.583
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	1,044	3,595	4,663	4,128	4,599
	various activities	thousand t	0.012	0.395	0	0.144	1.60
	Total	**thousand t**	**1,044**	**3,596**	**4,663**	**4,128**	**4,600**
EN16 SF_6	electricity generation	kg	0	0	0	10.5	0
		thousand t of CO_2 equivalent	0	0	0	0.239	0
	electricity distribution	kg	1.34	0.335	6.70	113	13.0
		thousand t of CO_2 equivalent	0.031	0.008	0.153	2.58	0.296
	Total	**kg**	**1.34**	**0.335**	**6.70**	**124**	**13.0**
		thousand t of CO_2 equivalent	**0.031**	**0.008**	**0.153**	**2.82**	**0.296**
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		**thousand t of CO_2 equivalent**	**1,044**	**3,596**	**4,663**	**4,131**	**4,601**
EN18 Avoided CO_2 emissions							
Due to hydro generation from natural flows		thousand t	2,046	6,973	9,761	6,631	6,544
Due to wind generation		thousand t	0	14.7	36.4	72.4	69.9
Due to generation from renewables		**thousand t**	**2,046**	**6,988**	**9,798**	**6,704**	**6,614**

	Source		2007	2008	2009	2010	2011
EN21 Waste waters (discharged quantity)	thermal generation	million m^3	0	0.980	1.49	2.71	2.60
EN21 Conventional polluting load in waste waters discharged by installations							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	0	0	2,968	8,123	0
	in some plants with an overall capacity of	MW	0	0	128	128	0
Total nitrogen (expressed as N)	thermal generation	kg	0	0	266	0	0
	in some plants with an overall capacity of	MW	0	0	1,799	0	0
Total phosphorus (expressed as P)	thermal generation	kg	0	0	476	0	56.0
	in some plants with an overall capacity of	MW	0	0	1,799	0	390
BOD	thermal generation	kg	0	0	6,085	0	0
	in some plants with an overall capacity of	MW	0	0	1,799	0	0
EN22 Non-hazardous special waste							
Coal bottom ash	fossil-fired thermal generation						
production		t	0	0	14,550	5,688	13,584
Coal flyash	fossil-fired thermal generation	t	17,538	70,501	66,665	44,120	69,668
Other							
production	electricity generation	t	211	356	935	1,271	1,275
	electricity distribution	t	1,819	49.0	36,098	3,618	36,615
	various activities	t	0	0	0	0	0.443
	Total	**t**	**2,029**	**405**	**37,033**	**4,889**	**37,890**
delivery to recovery operators	electricity generation	t	0	2.74	56.5	84.3	25.7
	electricity distribution	t	0	14.1	12,415	848	36,762
	Total	**t**	**0**	**16.9**	**12,472**	**933**	**36,788**
Total							
production	**electricity generation**	**t**	**17,749**	**70,857**	**82,150**	**51,080**	**84,527**
	electricity distribution	**t**	**1,819**	**49.0**	**36,098**	**3,618**	**36,615**
	various activities	**t**	**0**	**0**	**0**	**0**	**0.443**
	Total	**t**	**19,568**	**70,906**	**118,248**	**54,698**	**121,142**
delivery to recovery operators	**electricity generation**	**t**	**0**	**2.74**	**56.5**	**84.3**	**25.7**
	electricity distribution	**t**	**0**	**14.1**	**12,415**	**848**	**36,762**
	Total	**t**	**0**	**16.9**	**12,472**	**933**	**36,788**
EN22 Hazardous special waste							
production	electricity generation	t	47.7	375	400	426	296
	electricity distribution	t	2.55	106	138	26.1	27.5
	various activities	t	0	0	0	0.020	1.04
	Total	**t**	**50.2**	**481**	**538**	**452**	**325**
of which with PCBs	*electricity generation*	*t*	*0*	*63.1*	*135*	*112*	*157*
	electricity distribution	*t*	*0*	*4.56*	*5.63*	*8.71*	*6.33*
	Total	***t***	***0***	***67.7***	***140***	***120***	***163***
delivery to recovery operators	electricity generation	t	0	65.7	16.3	305	91.3
	electricity distribution	t	0	6.34	6.71	0	26.2
	Total	**t**	**0**	**72.0**	**23.0**	**305**	**118**
of which with PCBs	*electricity generation*	*t*	*0*	*62.0*	*0.384*	*98.2*	*91.3*
	electricity distribution	*t*	*0*	*2.39*	*0.800*	*0*	*11.8*
	Total	***t***	***0***	***64.4***	***1.18***	***98.2***	***103***

	Source		2007	2008	2009	2010	2011
EN22 Total special waste							
production	electricity generation	t	17,797	71,232	82,550	51,506	84,824
	electricity distribution	t	1,821	155	36,236	3,644	36,642
	various activities	t	0	0	0	0.020	1.48
	Total	t	**19,618**	**71,387**	**118,785**	**55,150**	**121,467**
delivery to recovery operators							
	electricity generation	t	0	68.4	72.8	389	117
	electricity distribution	t	0	20.5	12,422	848	36,788
	Total	t	**0**	**88.9**	**12,495**	**1,237**	**36,905**

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	38.9	41.1	43.0	39.0	43.9	12.9	12.6
underground	% of entire LV grid	16.8	17.4	18.0	17.6	18.0	7.10	2.30
Total	% of entire LV grid	55.8	58.5	61.0	56.5	61.9	10.9	9.60
MV cable lines								
overhead	% of entire MV grid	15.7	18.0	19.1	21.9	24.0	52.9	9.60
underground	% of entire MV grid	18.4	18.3	20.1	18.5	18.9	2.70	2.20
Total	% of entire MV grid	34.1	36.3	39.2	40.3	43.0	26.1	6.70
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	47.5	50.1	52.7	50.1	54.6	14.9	9.00
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation (simple)	kcal/kWh	2,509	2,016	2,027	1,843	1,863	-25.7	1.10
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.097	0	0.095	0.060	0.085	-12.4	41.7
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.111	0.678	0.463	0.845	0.823	641	-2.60
excluding contribution of as-is sea water	liters/kWh	0.111	0.678	0.463	0.845	0.823	641	-2.60
EN8 Coverage of requirements of water for industrial uses								
from wells	% of requirements	85.3	89.0	78.0	91.3	90.4	6.00	-1.00
from aqueducts	% of requirements	14.7	0	4.65	0	0	-100	0
Total from inland waters	**% of requirements**	**100**	**89.0**	**82.6**	**91.3**	**90.4**	**-9.60**	**-1.00**
from the sea (desalinated)	% of requirements	0	11.0	17.4	8.69	7.61	0	-12.4
EN10 from waste waters (used inside plants)	% of requirements	0	0	0	0	1.96	0	0

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	0.032	3.95	0.737	0.006	0.043	34.4	616
gas oil	% of total fuel consumption	58.2	55.6	45.6	13.2	3.75	-93.6	-71.6
natural gas	% of total fuel consumption	14.6	11.4	24.4	67.6	69.7	377	3.1
coal	% of total fuel consumption	27.2	29.1	29.3	19.1	26.5	-2.60	38.7
MS fuel oil	% of total fuel oil consumption	0	0	0.037	0	0	0	0
LS fuel oil	% of total fuel oil consumption	100	100	86.2	0	0	-100	0
VLS fuel oil	% of total fuel oil consumption	0	0	13.7	100	100	0	0
natural gas, technologically captive use	% of total natural gas consumption	100	100	100	100	100	0	0
of which in combined-cycle units	*% of total natural gas consumption*	*74.6*	*86.4*	*82.3*	*92.0*	*93.6*	*25.5*	*1.70*
natural gas, non-technologically captive use	% of total natural gas consumption	0	0	0	0.004	0.008	0	100
Electricity generation from renewables								
hydro from natural flows	% of total generation	66.2	65.9	67.5	61.2	58.4	-11.8	-4.60
wind	% of total generation	0	0.139	0.252	0.669	0.624	0	-6.70
Total	**% of total generation**	**66.2**	**66.0**	**67.7**	**61.9**	**59.0**	**-10.9**	**-4.70**
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	2.12	2.09	1.49	0.904	1.14	-46.2	26.1
EN20 NO_X (thermal generation)	g/kWh thermal net	1.36	1.50	1.16	0.807	0.799	-41.2	-1.00
EN20 Particulates (thermal generation)	g/kWh thermal net	0.792	0.106	0.156	0.162	0.182	-78.8	3.70
EN16 CO_2 (thermal generation)	g/kWh thermal net	849	720	639	507	530	-37.6	4.50
EN20 SO_2 (total from thermal generation)	g/kWh total net	0.715	0.710	0.481	0.344	0.466	-34.8	35.5
EN20 NO_X (total from thermal generation)	g/kWh total net	0.458	0.509	0.373	0.307	0.328	-28.4	6.80
EN20 Particulates (total from thermal generation)	g/kWh total net	0.268	0.036	0.050	0.062	0.075	-74.3	11.3
EN16 CO_2 (total from thermal generation)	g/kWh total net	287	244	206	193	217	-24.4	12.4
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.036	0.009	0.037	0.155	0.197	447.2	27.1
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	40.0	0	0	-100
COD	mg/kWh thermal net	0	0	0	0	0.054	0	0
EN22 **Specific production of waste**								
Coal ash (thermal generation)	g/kWh net from coal	58.1	59.0	44.5	40.8	45.7	-21.3	12.0
EN22 **Waste recovery**								
Other non-hazardous special waste								
electricity generation	% of production	0	0.770	6.04	6.63	2.02	0	-69.5
electricity distribution	% of production	0	28.9	34.4	23.4	100	0	327
Total	**% of production**	**0**	**4.17**	**33.7**	**19.1**	**97.1**	**0**	**408**
Other hazardous special waste								
electricity generation	% of production	0	17.5	4.08	71.6	30.8	0	-57.0
electricity distribution	% of production	0	5.98	4.88	0	95.2	0	0
Total	**% of production**	**0**	**15.0**	**4.28**	**67.4**	**36.3**	**0**	**-46.1**
Total special waste								
electricity generation	% of production	0	0.096	0.088	0.756	0.138	0	-81.7
electricity distribution	% of production	0	13.2	34.3	23.3	100	0	329
Total	**% of production**	**0**	**0.125**	**10.5**	**2.24**	**30.4**	**0**	**1,257**

Highlights of 2011

In Chile, Enel operates through Endesa (thermal, wind and hydro power generation, electricity distribution and sales) and Enel Green Power (hydro and wind power generation).

Fossil-fired thermal generation was up by ~0.5 TWh (+~6%), whereas hydro generation was down by -~0.75 TWh, shifting the generating mix towards thermal.

EN1 EN3 The fuel mix changed in favor of coal (+~7 percentage points) and natural gas (+~2 percentage points) to the expense of gas oil (-~9.5 percentage points) and fuel oil (all VLS, -~0.5 percentage points).

EN1 EN3 EN5 The net heat rate of simple thermal generation was practically unchanged (+1%).

EN5 EN6 EN18 In Chile, under an agreement between the Ministry of National Assets and the Ministry of Energy, Enel Green Power (through its Enel Chile subsidiary) participated in a tender to win the concession of public land for construction of a wind farm. Enel Green Power obtained a concession of about 2,600 ha in the Taltal district (Antofagasta region), 1,550 km north of Santiago.

EN8 Net specific requirements of water for industrial uses in thermal generation were down by about 27%.

Thanks to higher utilization of coal, specific emissions had the following variations:

EN16 net specific emissions of CO_2 in thermal generation, referred to total electricity generation, were up by 23 g/kWh (+~5%);

EN20 net specific emissions of SO_2, NO_X and particulates were up by ~0.2 g/kWh (+~26%), down by ~0.08 g/kWh (-~1%) and up by ~0.006 g/kWh (+~4%), respectively.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to roughly 6.6 million tonnes, in line with the value of last year.

EN22 The sharp increase in ash production in 2011 was due to higher generation from coal. The rise in the percentage of waste recovery to about 30% is to be ascribed to total waste recovery in electricity distribution.

EN19 Ozone-depleting substances:

R22

Emissions: 54 kg corresponding to 3 kg of CFC11 (determined on the basis of gas replenishments in air conditioning systems).

EN23 Chilectra, electricity distribution: different spills of dielectric oil (total: 590 l) occurred. The three major ones (total: 300 l) were due to explosion, theft and fault; the other 17 were due to leakage from pole-mounted transformers, generally hit by cars.

Hydro plant of El Toro: 80 l of oil spilled into the Polcura river. To immediately respond to the emergency and avoid damage downstream, oil absorbent booms were placed along the nets of the intake structure. The analysis of the event made it possible to identify its causes and plan corrective measures (repair of the cooling circuit and tightness tests) and preventive measures (checking of equipment).

EN26 Environmental enhancements.

Water

> Chilectra, electricity distribution: water-saving scheme in administrative offices by introducing low-flow tap aerators.

> Hydro plants of Pullinque and Pilmaiquén: construction and entry into operation of three municipal waste-water treatment systems.

Emissions

> The gas turbine units of San Isidro, San Isidro II and Quintero were equipped with a demineralized water injection system in order to abate NO_X during combustion.

> Coal-fired plant of Bocamina: desulfurizers are being installed.

Noise

> Chilectra, electricity distribution: ten noise emission monitoring surveys were carried out near some distribution substations located in the most sensitive zones of the metropolitan area; the surveys were conducted at night time (the most critical one). In one case, further investigations were entrusted to a third party.

> Hydro plant of Pullinque: mitigation of noise levels in plant areas (insulation of turbine pits, etc.) and workshops.

Waste

> Chilectra, electricity distribution: a scheme was put in place to collect waste items produced both inside the company and outside (by customers) and deliver them to recovery operators. The waste is collected at the “Centro de Educación Ambiental Ecochilectra” and then sold to recovery operators. Customers delivering waste to Chilectra are entitled to a discount on their electricity bills; the discount is proportional to the amount of recyclable waste delivered to the charitable organizations participating in the project.

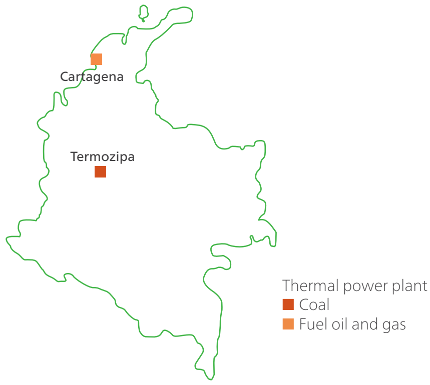
> Hydro plant of Abanico: disposal of PCB-containing oil, thus completing the plan of 100% removal of contaminated oil from electricity generation in Chile.

Other

> Thermal plant of Quintero: a clean generation agreement (“Acuerdo de Producción Limpia”) was signed with a view to contributing to sustainable development in the area surrounding the plant through voluntary efforts of environmental protection, efficient energy use, hygiene and safety.

Colombia

Thermal power generation Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
2	411	470

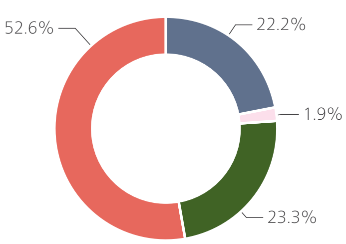
Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW
Steam (condensing)	**2**	**4**	**411**

The thermal power plants of Cartagena and Termozipa are both ISO 14001-certified.

Fuel consumption

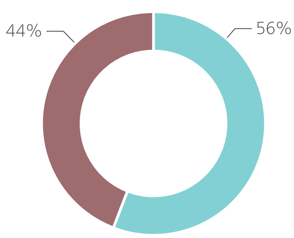
Total: 148,543 t of oil-equivalent



- Fuel oil
- Gas-oil
- Natural gas
- Coal

Water for industrial uses

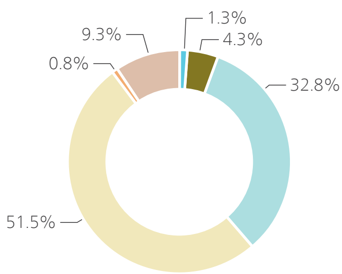
Total requirements: 170,432 m^3
Total abstraction from inland waters: 170,432 m^3



- From rivers
- From acqueducts

Expendables

Total: 330 t



- Resins, hydrazine, carbohydrazide & hydrogen peroxide
- Sodium hypochlorite, chlorine dioxide, ferrous sulfate, ferrous chloride and trisodium phosphate
- Sulfuric & hydrochloric acids
- Caustic soda
- Lubricating oil
- Other

Waste waters

29,862 m^3

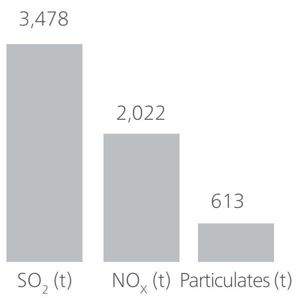
Discharged

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

Net electricity generation

Total: **470 million kWh**

Emissions into the atmosphere



CO_2: **424,610 t**

Special waste

Total production: **18,511 t**

Total delivery to recovery operators: **570 t**

Non-hazardous

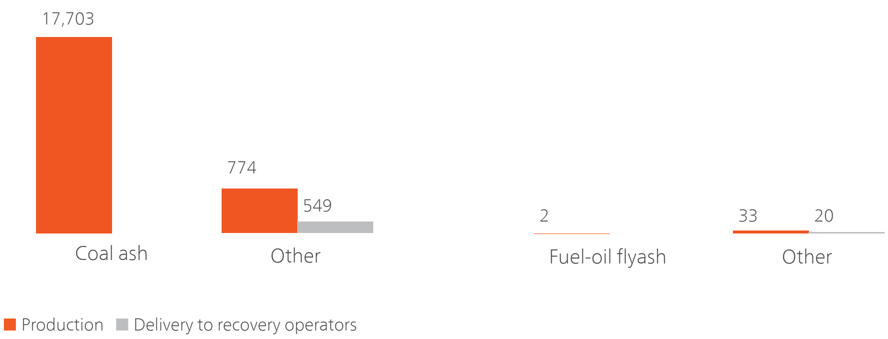
Production: 18,476 t

Delivery to recovery operators: 549 t

Hazardous

Production: 35 t

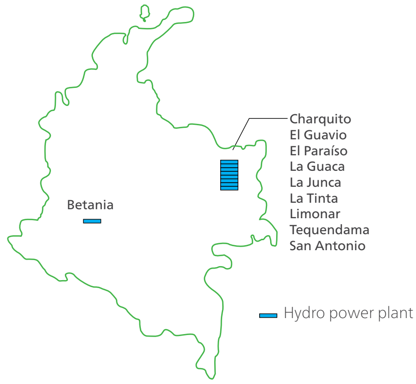
Delivery to recovery operators: 20 t



Colombia

Hydro power generation

Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
10	2,455	11,620

Power installations

	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	8	13	712
Pondage/reservoir	2	10	1,743
	10	**23**	**2,455**

All the power plants are ISO 14001-certified.

Net electricity generation

Total: 11,620 million kWh

Expendables

Total: 15 t

Equivalent yearly hours of utilization*

Hydro: **4,733 hours**

* Yearly generation/capacity ratio. For Endesa generation is considered to refer to the entire year.

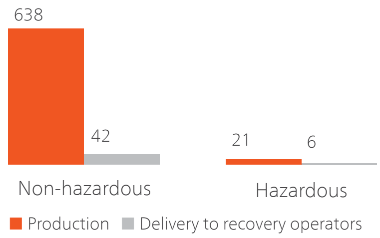
Avoided CO_2 emissions (t)

Due to hydro generation from natural flows	10,495,831

Emissions from the otherwise necessary fossil-fired thermal generation.
The contribution of geothermal generation has been calculated on the assumption that the related CO_2 emissions are of natural origin.

Special waste

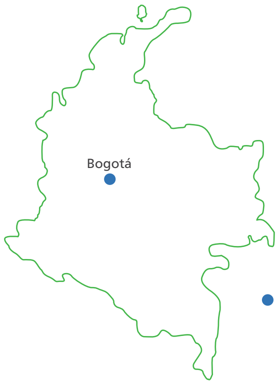
Total production: **659 t**
Total delivery to recovery operators: **48 t**



Colombia

Electricity distribution

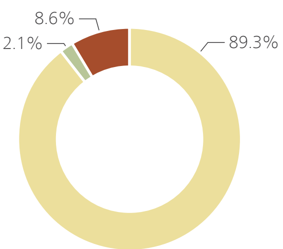
Endesa SA



● Headquarters of the company of the Group which carries out the activity (Codensa)

The Numbers

Substations	Capacity (MVA)	Total lines (km)
65,867	17,271	53,341



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	63	8,619
MV/LV	65,746	8,301
MV/MV	58	351
	65,867	**17,271**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	1,281	-	0	**1,281**
MV	19,320	230	3,450	**23,000**
LV	27,026	872	1,162	**29,060**
	47,627	**1,102**	**4,612**	**53,341**

The organization has an ISO 14001-certified environmental management system in place,

General data

Municipalities served: **102**
Surface area served: **14,087 km²**
Customers connected to the grid: **2,495,810**
(of which supplied by companies of the Group: **2,495,789**)

Electricity

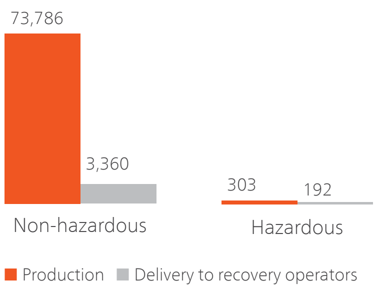
Total electricity distributed:
12,857 million kWh
Own consumption for grid operation:
128 million kWh

Emissions into the atmosphere

SF_6: **182 kg** (4,036 t of CO_2 equivalent)

Special waste

Total production: **74,089 t**
Total delivery to recovery operators: **3,552 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	10	10	11	12	12
thermal	no.	2	2	2	2	2
hydro	no.	8	8	9	10	10
Net maximum electrical capacity	MW	1,897	1,941	2,847	2,866	2,866
thermal	MW	253	297	411	411	411
hydro	MW	1,644	1,644	2,436	2,455	2,455
Power lines (circuit-length)						
Total	km	27,666	27,987	42,322	51,988	53,341
high-voltage	km	846	823	1,240	1,275	1,281
medium-voltage	km	12,078	12,349	18,881	22,692	23,000
low-voltage	km	14,742	14,815	22,201	28,021	29,060
EN29 **Real-estate & service management**						
Gross real-estate surface area	thousand m^2	0	0	0	0	4,552

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
fuel oil	thousand t	0.135	2.57	7.33	28.8	34.4
	thousand toe	0.129	2.39	7.39	30	33
MS	*thousand t*	*0.135*	*2.28*	*7.33*	*21.2*	*34.4*
	thousand toe	*0.129*	*2.17*	*7.39*	*22.1*	*33*
LS	*thousand t*	*0*	*0.290*	*0*	*7.60*	*0*
	thousand toe	*0*	*0.223*	*0*	*7.91*	*0*
gas oil	thousand t	0.561	3.08	2.81	2.26	2.74
	thousand toe	0.568	2.85	3.08	2.30	2.81
natural gas	million m^3	2.06	5.58	76.2	73.6	43.3
	thousand toe	1.92	4.46	60.9	58.7	34.6
non-technologically captive use	*million m^3*	*2.06*	*5.58*	*76.2*	*73.6*	*43.3*
	thousand toe	*1.92*	*4.46*	*60.9*	*58.7*	*34.6*
coal	thousand t	44.8	198	428	406	135
	thousand toe	28.6	120	260	236	78.2
Total	**thousand toe**	**31.2**	**130**	**332**	**327**	**149**
	TJ	**1,306**	**5,448**	**13,884**	**13,683**	**6,219**
Real-estate & service management	thousand toe	0.087	0	0	0	0
Grand total	**thousand toe**	**31.3**	**130**	**332**	**327**	**149**
	TJ	**1,310**	**5,448**	**13,884**	**13,683**	**6,219**
EN4 **Primary electricity**						
Real-estate & service management	million kWh	0	0	0	0	1.30

		2007	2008	2009	2010	2011
EN8 Water for industrial uses						
From rivers (including meteoric waters from secondary rainfall)	million m^3	0.034	0.093	0.338	0.140	0.096
From aqueducts	million m^3	0.014	0.039	0.097	0.116	0.075
Total abstraction from inland waters	**million m^3**	**0.048**	**0.132**	**0.435**	**0.256**	**0.171**
for thermal generation	million m^3	0.048	0.132	0.435	0.256	0.171
EN8 EN21 Open-cycle cooling water						
For thermal generation (simple and CHP)	million m^3	18.3	87.4	210	205	128
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0	0.752
EN1 Expendables						
Hydrazine	t	0	0.952	2.89	4.69	4.4
Sodium hypochlorite	t	0	4.50	10	7.11	14.2
Ferrous sulfate	t	0	0.168	0	0	0
Trisodium phosphate	t	0	0.270	0.034	0.050	0
Sulfuric & hydrochloric acids	t	0	58.5	103	120	108
Caustic soda	t	0	27.4	158	172	170
Lubricating oil	t	2.60	9.50	19.3	12.7	17.8
Dielectric oil	t	14.4	44.9	1.18	25.0	23.0
Other	t	0	5,762	10.6	12.5	30.7
Total	**t**	**17.0**	**5,908**	**306**	**355**	**368**
for thermal generation	t	0	5,856	299	321	330
for hydro generation	t	1.79	7.60	6.80	8.32	15.2
for electricity distribution	t	15.2	44.9	0	25.0	23.0
EN1 PCB survey						
Equipment & transformers with PCBs > 500 ppm (excluding their oil)	t	0	0	33	35.6	35.6
Oil with PCBs > 500 ppm contained in equipment & transformers	t	0	0	0	0.740	0.740
Equipment & transformers with PCBs > 50 ppm and ≤ 500 ppm (excluding their oil)	t	0	0	54.5	36.0	36.0
Oil with PCBs > 50 ppm and ≤ 500 ppm contained in equipment & transformers	t	0	0	46.0	1.20	1.21

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**86.3**	**337**	**973**	**1,030**	**470**
fuel oil & gas oil	million kWh	1.73	14.8	31.7	87.7	154
natural gas	million kWh	5.16	14.1	202	158	52.1
coal	million kWh	79.4	308	740	784	264
From renewables (hydro from natural flows)	**million kWh**	**1,914**	**8,316**	**11,701**	**10,253**	**11,620**
Total	**million kWh**	**2,000**	**8,653**	**12,674**	**11,283**	**12,090**
Electricity consumption for pumping	million kWh	0	0.070	96.6	99.2	0
Available generation	million kWh	2,000	8,653	12,577	11,184	12,857
Electricity distribution						
Electricity distributed	million kWh	1,918	7,927	4,418	12,141	4,757
EN4 Electricity consumption for grid operation	million kWh	0	3.79	7.00	9.37	128

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	0.812	4.39	8.51	9.19	3.48
EN20 NO_X	thermal generation	thousand t	0.140	0.404	2.39	5.23	2.02
EN20 Particulates	thermal generation	thousand t	0.138	0.859	1.69	1.93	0.613
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	82.2	472	1,124	944	425
	various activities	thousand t	0.007	0	0	0	0
	Total	**thousand t**	**82.2**	**472**	**1,124**	**944**	**425**
EN16 SF_6	electricity generation	kg	0	0	0	12.5	605
		thousand t of CO_2 equivalent	0	0	0	0.285	13.8
	electricity distribution	kg	52.3	139	83	115	182
		thousand t of CO_2 equivalent	1.19	3.18	1.89	2.62	4.15
	Total	**kg**	**52.3**	**139**	**83**	**127**	**787**
		thousand t of CO_2 equivalent	**1.19**	**3.18**	**1.89**	**2.90**	**17.9**
EN16 **Total greenhouse gases (CO_2, SF_6, CH_4) scope 1**		**thousand t of CO_2 equivalent**	**83.4**	**475**	**1,126**	**947**	**443**
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows		thousand t	1,825	11,646	13,513	9,394	10,496
EN21 **Waste waters (discharged quantity)**	thermal generation	million m^3	0	0.034	0.087	0.049	0.030
EN21 **Conventional polluting load in waste waters discharged by installations**							
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	0	0	0	0	6.21
	in some plants with an overall capacity of	MW	0	0	0	0	208
Total nitrogen (expressed as N)	thermal generation	kg	0	0	2.62	762	510
	in some plants with an overall capacity of	MW	0	0	208	208	208
Total phosphorus (expressed as P)	thermal generation	kg	0	0	0.040	11.8	158
	in some plants with an overall capacity of	MW	0	0	208	208	208
COD	thermal generation	kg	0	0	1,622	9,860	1,634
	in some plants with an overall capacity of	MW	0	0	444	236	444
BOD	thermal generation	kg	0	0	885	30,973	139
	in some plants with an overall capacity of	MW	0	0	444	444	444
EN22 **Non-hazardous special waste**							
Coal bottom ash	fossil-fired thermal generation						
production		t	0	60,459	53,055	57,352	17,703
delivery to recovery operators		t	0	0	0	0	46,506
Coal flyash	fossil-fired thermal generation						
production		t	8,964	0	0	0	0
Other							
production	electricity generation	t	210	427	277	1,512	1,412
	electricity distribution	t	381	1,910	34,279	50,594	73,786
	Total	**t**	**591**	**2,337**	**34,556**	**52,106**	**75,198**
delivery to recovery operators	electricity generation	t	25.9	1.79	59.3	383	591
	electricity distribution	t	381	1,453	4,396	1,597	3,360
	Total	**t**	**407**	**1,455**	**4,456**	**1,980**	**3,951**

	Source		2007	2008	2009	2010	2011
Total							
production	electricity generation	t	9,174	60,886	53,333	58,864	19,114
	electricity distribution	t	381	1,910	34,279	50,594	73,786
	Total	t	**9,555**	**62,796**	**87,612**	**109,458**	**92,900**
delivery to recovery operators	electricity generation	t	25.9	1.79	59.3	383	47,097
	electricity distribution	t	381	1,453	4,396	1,597	3,360
	Total	t	**407**	**1,455**	**4,456**	**1,980**	**50,457**
EN22 **Hazardous special waste**							
production	thermal generation	t	0	0	0	0.506	2.26
	electricity generation	t	11.7	30.3	84.3	86.2	53.1
	electricity distribution	t	23.9	115	220	233	303
	various activities	t	0	0	0	0	0.030
	Total	t	**35.5**	**145**	**304**	**320**	**358**
of which with PCBs	*electricity generation*	*t*	*0*	*22.8*	*55.2*	*27.8*	*17.6*
	electricity distribution	*t*	*22.6*	*91.9*	*170*	*120*	*188*
	Total	*t*	***22.6***	***115***	***225***	***148***	***206***
delivery to recovery operators	electricity generation	t	0.962	27.3	26.7	43.3	26.4
	electricity distribution	t	15.9	101	216	123	192
	Total	t	**16.9**	**128**	**243**	**166**	**219**
of which with PCBs	*electricity generation*	*t*	*0*	*26.6*	*22.3*	*27.8*	*12.5*
	electricity distribution	*t*	*15.9*	*91.9*	*170*	*120*	*188*
	Total	*t*	***15.9***	***118***	***192***	***148***	***201***
EN22 **Total special waste**							
production	electricity generation	t	9,185	60,916	53,417	58,951	19,169
	electricity distribution	t	405	2,024	34,499	50,827	74,089
	various activities	t	0	0	0	0	0.030
	Total	t	**9,590**	**62,941**	**87,916**	**109,778**	**93,259**
delivery to recovery operators	electricity generation	t	26.9	29.1	86.0	426	47,123
	electricity distribution	t	397	1,554	4,613	1,720	3,552
	Total	t	**424**	**1,583**	**4,699**	**2,146**	**50,676**

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 **Land**								
LV cable lines								
overhead	% of entire LV grid	2.80	2.86	3.31	3.30	3.00	7.10	-9.10
underground	% of entire LV grid	2.92	3.02	3.11	3.36	4.00	37.0	19.0
Total cable lines	**% of entire LV grid**	**5.72**	**5.88**	**6.42**	**6.66**	**7.00**	22.4	5.10
MV cable lines								
overhead	% of entire MV grid	0.855	0.869	0.879	0.876	1.00	17.0	14.2
underground	% of entire MV grid	14.4	14.7	14.8	15.1	15.0	4.20	-0.700
Total cable lines	**% of entire MV grid**	**15.3**	**15.6**	**15.7**	**16.0**	**16.0**	4.60	0
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	9.71	10.0	10.4	10.6	10.7	10.20	0.900

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	3,616	3,862	3,407	3,172	3,160	-12.6	-0.400
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0	0.048	0.158	0.077	2.69	0	3,393
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.557	0.392	0.447	0.249	0.364	-34.6	46.2
excluding contribution of as-is sea water	liters/kWh	0.557	0.392	0.447	0.249	0.364	-34.6	46.2
EN8 Coverage of requirements of water for industrial uses								
from rivers (including meteoric waters from secondary rainfall)	% of requirements	70.8	70.5	77.7	54.7	56.1	-20.8	2.60
from aqueducts	% of requirements	29.2	29.5	22.3	45.3	43.9	50.3	-3.10
EN1 EN3 Fossil fuel consumption for thermal generation								
fuel oil	% of total fuel consumption	0.414	1.84	2.23	9.17	22.2	5,262	142
gas oil	% of total fuel consumption	1.82	2.19	0.928	0.705	1.89	3.80	168
natural gas	% of total fuel consumption	6.14	3.43	18.4	18	23.3	279	29.4
coal	% of total fuel consumption	91.6	92.5	78.5	72.2	52.6	-42.6	-27.1
MS fuel oil	% of total fuel oil consumption	100	90.7	100	73.6	100	0	35.9
LS fuel oil	% of total fuel oil consumption	0	9.32	0	26.4	0	0	-100.0
natural gas, non-technologically captive use	% of total natural gas consumption	100	100	100	100	100	0	0
Electricity generation from renewables								
hydro from natural flows	% of total generation	95.7	96.1	92.3	90.9	96.1	0.400	5.7
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	9.41	13	8.74	8.92	7.40	-21.4	-17.0
EN20 NO_X (thermal generation)	g/kWh thermal net	1.62	1.20	2.46	5.07	4.30	165	-15.2
EN20 Particulates (thermal generation)	g/kWh thermal net	1.60	2.55	1.73	1.87	1.30	-18.8	-30.5
EN16 CO_2 (thermal generation)	g/kWh thermal net	953	1,400	1,155	916	903	-5.20	-1.40
EN20 SO_2 (total from thermal generation)	g/kWh total net	0.406	0.507	0.671	0.814	0.288	-29.1	-64.6
EN20 NO_X (total from thermal generation)	g/kWh total net	0.070	0.047	0.189	0.463	0.167	138	-63.9
EN20 Particulates (total from thermal generation)	g/kWh total net	0.069	0.099	0.133	0.171	0.051	-26.1	-70.2
EN16 CO_2 (total from thermal generation)	g/kWh total net	41.1	54.5	88.7	83.7	35.1	-14.6	-58.1
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	2.25	4.60	0.297	0.460	2.76	22.7	500
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)								
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	0	0	0	0	0.031	0	0
Total nitrogen (expressed as N)	mg/kWh thermal net	0	0	0	3.18	2.57	0	-19.2
Total phosphorus (expressed as P)	mg/kWh thermal net	0	0	0	0.049	0.795	0	1,522
COD	mg/kWh thermal net	0	0	0	12.5	3.54	0	-71.7
BOD	mg/kWh thermal net	0	0	0	30	0.3	0	-99.0

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN22 Specific waste production								
Coal ash (thermal generation)	g/kWh net from coal	113	196	71.7	73.1	67.1	-40.6	-8.2
Oil flyash (thermal generation)	g/kWh net from fuel oil & gas oil	0	0	0	0.006	0.015	0	150
Oil bottom ash (thermal generation)	g/kWh net from fuel oil & gas oil	0	0	0	0.006	0.015	0	150
EN22 Waste recovery								
Coal and brown-coal ash		0	0	0	0	263	0	0
Other non-hazardous special waste								
electricity generation	% of production	12.4	0.419	21.4	25.3	41.9	237	65.6
electricity distribution	% of production	100	76.1	12.8	3.16	4.55	-95.5	44.0
Total	**% of production**	**68.9**	**62.3**	**12.9**	**3.80**	**5.25**	**-92.4**	**38.2**
Total non-hazardous special waste								
electricity generation	% of production	0.283	0.003	0.111	0.651	246	86,825	37,688
electricity distribution	% of production	100	76.1	12.8	3.16	4.55	-95.5	44.0
Total	**% of production**	**4.26**	**2.32**	**5.09**	**1.81**	**54.3**	**1,174**	**2,900**
Other hazardous special waste								
electricity generation	% of production	8.25	90.1	31.7	50.2	49.7	502	-1.00
electricity distribution	% of production	66.7	87.7	98.3	52.8	63.5	-4.80	20.3
Total	**% of production**	**47.5**	**88.2**	**79.9**	**52.1**	**61.5**	**29.5**	**18.0**
Total hazardous special waste								
electricity generation	% of production	8.25	90.1	31.7	49.9	47.7	478	-4.40
electricity distribution	% of production	66.7	87.7	98.3	52.8	63.5	-4.80	20.3
Total	**% of production**	**47.5**	**88.2**	**79.9**	**52.0**	**61.1**	**28.6**	**17.5**
Total special waste								
electricity generation	% of production	0.293	0.048	0.161	0.723	246	83,859	33,924
electricity distribution	% of production	98	76.8	13.4	3.38	4.80	-95.1	42.0
Total	**% of production**	**4.42**	**2.52**	**5.35**	**1.96**	**54.3**	**1,128**	**2,670**

Highlights of 2011

Fossil-fired thermal generation in 2011 was down by ~500 GWh on 2010, whereas hydro generation was up by ~1.5 TWh, thus shifting the generating mix towards hydro.

In Colombia, Enel operates through Endesa (thermal and hydro power generation, electricity distribution and sale).

EN1 EN3 The fuel mix changed in favor of fuel oil (+~13 percentage points), natural gas (+~6 percentage points) and gas oil (+~1 percentage point) to the expense of coal (-~20 percentage points). The lower weight of coal in the fuel mix led to the following improvements:

EN16 net specific emissions of CO_2 in thermal generation were down by 13 g/kWh (-~1.4%). As a result, total net specific emissions of CO_2 reached the minimum value of the 5-year period (35 g/kWh).

EN1 EN3 EN5 The net heat rate of simple thermal generation continued to fall, albeit slightly (-0.4% on 2010).

EN8 Net specific requirements of water for industrial uses in thermal generation were up by about 46% (from 0.25 to 0.36 l/kWh) from 2010.

EN20 In 2011, thanks to the lower weight of coal in the fuel mix, net specific emissions of SO_2, NO_X and particulates were down by ~17%, ~15% and ~30%, respectively.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to approximately 10.5 million tonnes, roughly 12% more than in the previous year owing to higher hydro generation.

EN22 The amount of waste recovery in 2011 sharply increased, owing to recovery of ash produced in previous years and stored at the plant site. The percentage of waste recovery was equal to 54%, i.e. up by over 50 percentage points.

EN26 Environmental enhancements.

Water

> Codensa, electricity distribution: water-saving scheme in administrative offices.
> Power plants: in 2011, water consumption was down by 19% per person.
> Plant of El Guavio: installation of a system collecting rainwater to be reused in offices.

Emissions

> Codensa, electricity distribution: SF_6 and transport-vehicle emission monitoring schemes.
> Termozipa plant: investments to abate specific emissions of particulates to below 100 mg/Nmc.

Noise

> Codensa, electricity distribution: response to customers' complaints about noise emitted by installations, by applying specific corrective methods, depending on circumstances.

Waste

> Codensa, electricity distribution: careful management of waste, from production to disposal/final recovery. Used PCB-containing oils are exported to Finland for incineration. To comply with commitments under the Stockholm Convention, the company is investigating technologies to decontaminate PCB-containing equipment on site and avoid exporting used oils and related transport risks.

Costa Rica

Hydro and wind power generation

Enel Green Power SpA

Hydro power plant
Wind farm

The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
3	55	170

Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	**2**	**2**	**31**

WIND	Power plants no.	Net maximum electrical capacity MW
	1	**24**

All the power plants are ISO 14001-certified.

Other data

Wind generation

Wind systems

Surface area occupied by platforms, service roads, buildings: **35 ha**

Hydro generation

Emptied reservoirs

Quantity: **2**

Alluvial sediments removed by flushing them out through bottom outlets: **17,250 m^3**

Alluvial sediments removed by mechanical equipment : **23,500 m^3** (of which reused locally: **23,399 m^3**)

Equivalent yearly hours of utilization*

Hydro: **3,665 hours**

Wind: **2,358 hours**

* Yearly generation/capacity ratio.

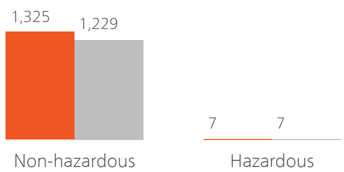
Expendables

Total: 3.03 t

Special waste

Total production: **1,331 t**

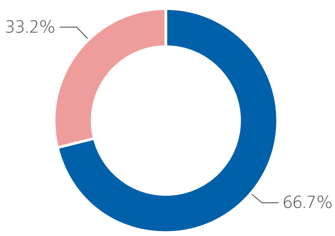
Total delivery to recovery operators: **1,236 t**



Production Delivery to recovery operators

Net electricity generation

Total: 170 million kWh



Hydro from natural flows
Wind

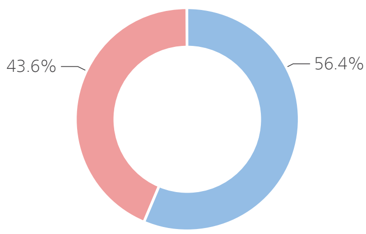
Avoided CO_2 emissions

Due to hydro generation from natural flows	63,126
Due to wind generation	31,449
Total	**94,575**

Emissions from the otherwise necessary fossil-fired thermal generation.

Net maximum electrical capacity

Total: 55 MW



Hydro
Wind

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	3	3	3	3	3
hydro	no.	2	2	2	2	2
wind	no.	1	1	1	1	1
Net maximum electrical capacity	MW	55.0	55.0	55.0	55.0	55.0
hydro	MW	31.0	31.0	31.0	31.0	31.0
wind	MW	24.0	24.0	24.0	24.0	24.0
EN29 **Real-estate & service management** (1)						
Vehicle fleet						
service vehicles	no.				20	12
special vehicles	no.				1	1
Gross real-estate surface area	thousand m^2				0.800	0.800

(1) These activities have been surveyed since 2010.

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Real-estate management	thousand toe	0	0	0	0	0.034
	TJ	0	0	0	0	1.42
EN4 **Primary electricity**						
Various activities	million kWh	0	0	0	0.277	0.014
EN1 **Expendables**						
Lubricating oil	t	1.77	0.337	0.229	1.38	1.96
Other	t	0	0	0	0	1.07
Total	**t**	**1.77**	**0.337**	**0.229**	**1.38**	**3.03**
for hydro generation	t	0.792	0.156	0.119	0.922	2.05
for wind generation	t	0.975	0.181	0.110	0.460	0.983

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables	million kWh	207	181	191	199	170
hydro from natural flows	million kWh	136	134	116	142	114
wind	million kWh	70.8	47.4	75.1	57.1	56.6

na: not available.

Emissions

	Source		2007	2008	2009	2010	**2011**
Emissions into the atmosphere							
EN16 CO_2	various activities	thousand t	0	0	0	0	0.105
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows		thousand t	83.2	81.9	71.2	79.0	63.1
Due to wind generation		thousand t	43.4	29.0	46.0	31.7	31.4
Due to generation from renewables		**thousand t**	**127**	**111**	**117**	**111**	**94.6**
EN22 **Non-hazardous special waste**							
production	electricity generation	t	115	40.7	108	114	1,325
	various activities	t	0	0	0	0.010	0.1
	Total	**t**	**115**	**40.7**	**108**	**114**	**1,325**
delivery to recovery operators	electricity generation	t	109	0	4.48	3.61	1,229
EN22 **Hazardous special waste**	electricity generation						
production		t	0.051	700	0.664	0.001	6.84
of which with PCBs		*t*	*0*	*0*	*0*	*0*	*1.5*
delivery to recovery operators		t	0.014	0	0.664	0.001	6.84
EN22 **Total special waste**							
production	electricity generation	t	115	741	109	114	1,331
	various activities	t	0	0	0	0.010	0.100
	Total	**t**	**115**	**741**	**109**	**114**	**1,332**
delivery to recovery operators	electricity generation	t	109	0	5.15	3.62	1,236

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
hydro from natural flows	% of total generation	65.7	73.8	60.7	71.3	66.7	1.50	-6.50
wind	% of total generation	34.3	26.2	39.3	28.7	33.3	-2.90	16.0
EN22 **Waste recovery**								
Non-hazardous special waste								
electricity generation	% of production	94.8	0	4.15	3.18	92.8	-2.10	2,818
Hazardous special waste								
electricity generation	% of production	27.5	0	100	100	100	263	0
Total special waste								
electricity generation	% of production	94.8	0	4.73	3.18	92.8	-2.10	2,818

Highlights of 2011

Total generation was down by ~29GWh due to lower hydro generation.

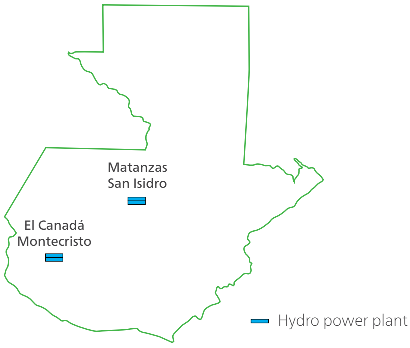
EN5 EN6 EN18 The company commenced the construction of a new hydro plant (Chucas, 50 MW of net maximum capacity) located between the Alajuela and San José provinces.
The plant is scheduled to be completed in the first half of 2013, thus bringing the installed capacity in this country to 105 MW.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to about 94,600 tonnes (roughly 15% less than in 2010 owing to lower hydro generation).

Enel operates in Costa Rica through Enel Green Power (hydro and wind power generation).

Guatemala

Hydro power generation   Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
4	76	356

Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	1	1	3
Pondage/reservoir	3	3	73
	4	**4**	**76**

Wind power generation

Total: 76 MW

Net electricity generation

Total: 356 million kWh

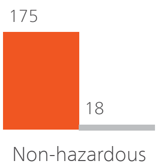
Gas oil

Total consumption: **7 toe**

Special waste

Total production: **175 t**

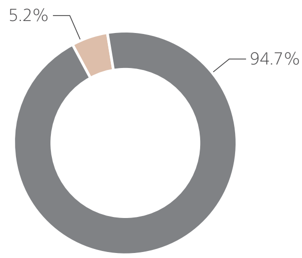
Total delivery to recovery operators: **18 t**



■ Production ■ Delivery to recovery operators

Expendables

Total: 0.4 t



■ Dielectric oil
■ Lubricating oil

Equivalent yearly hours of utilization*

Hydro: **4,684 hours**

* Yearly generation/capacity ratio.

Avoided CO_2 emissions

Due to hydro generation from natural flows: **197,634 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Other data

Hydro generation

Emptied reservoirs

Quantity: **4**

Alluvial sediments removed by flushing them out through bottom outlets: **500 m^3**

Alluvial sediments removed by mechanical equipment : **84,648 m^3** (of which reused locally: **84,648 m^3**)

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants (hydro)	no.	4	4	4	4	4
Net maximum electrical capacity (hydro)	MW	74	75.7	76.5	76.5	76.5
EN29 **Real-estate & service management** (1)						
Vehicle fleet						
service vehicles	no.				0	10
special vehicles	no.				0	3
vehicles for both private and service use	no.				8	8
Gross real-estate surface area	thousand m^2				0.700	0.700

(1) These activities have been surveyed since 2010.

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Real-estate management	thousand toe	0.002	0.004	0.001	0.014	0.051
	TJ	0.084	0.167	0.042	0.586	2.14
EN4 **Primary electricity**						
Real-estate management	million kWh	0	0	0	0.047	3.71
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0	0.001
EN1 **Expendables**						
Lubricating oil	t	1.79	1.49	1.10	0.677	0.361
Dielectric oil	t	0	8.64	0	8.50	0.02
Printing paper	t	0	0	0	2.48	3.05
Other	t	1.42	0.131	0	0	0
Total	**t**	**3.21**	**10.3**	**1.10**	**11.7**	**3.43**
for hydro generation	t	3.21	10.3	1.10	9.18	0.381

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables (hydro from natural flows)	million kWh	274	343	287	354	356

na: not available.

Emissions

	Source		2007	2008	2009	2010	**2011**
Emissions into the atmosphere							
EN16 CO_2	various activities	thousand t	0.004	0.011	0	0.022	0.136
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows		thousand t	168	210	176	197	198
EN22 **Non-hazardous special waste**							
production	electricity generation	t	27.3	135	48.2	342	175
	various activities	t	0	0	0	0.014	0.016
	Total	**t**	**27.3**	**135**	**48.2**	**342**	**175**
delivery to recovery operators	electricity generation	t	0	24.5	25.2	24.1	17.6
EN22 **Hazardous special waste**	electricity generation						
production		t	0.083	0.240	0.895	0.071	0.128
of which with PCBs		*t*	*0*	*0.206*	*0.825*	*0.001*	*0*
delivery to recovery operators		t	0.083	0.017	0	0.020	0.040
EN22 **Total special waste**							
production	electricity generation	t	27.4	135	49.1	342	175
	various activities	t	0	0	0	0.014	0.016
	Total	**t**	**27.4**	**135**	**49.1**	**342**	**175**
delivery to recovery operators	electricity generation	t	0.083	24.5	25.2	24.1	17.6

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
hydro from natural flows	% of total generation	100	100	100	100	100	0	0
EN22 **Waste recovery**								
Non-hazardous special waste								
electricity generation	% of production	0	18.2	52.4	7.05	10.1	-	43.3
Hazardous special waste								
electricity generation	% of production	100	7.08	0	28.2	31.3	-68.7	11.0
Total special waste								
electricity generation	% of production	0.303	18.1	51.5	7.05	10.1	3,233	43.3

Highlights of 2011

Enel operates in Guatemala through Enel Green Power (hydro power generation).

Total hydro generation was up by ~1 GWh, i.e. steady with respect to 2010.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to about 198,000 tonnes.

EN19 Ozone-depleting substances:

R22

Emissions: **6.8 kg**, measured on the basis of gas replenishments in the air conditioning system and **equivalent to 0.37 kg of CFC11**.

EN22 Waste recovery was up by 3 percentage points on 2010, reaching 10%.

EN26 Environmental enhancements.

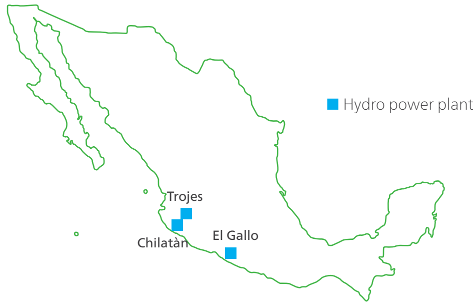
Waste

> Waste management is planned to improve thanks to disposal of materials removed from intake-structure trashracks and to removal of sediment from basins containing polluting substances.

Mexico

Hydro power generation

Enel Green Power SpA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
3	53	231

Power installations

	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Pondage/reservoir	**3**	**3**	**53**

Net electricity generation

Total: 231 million kWh

Avoided CO_2 emissions

Due to hydro generation from natural flows: **128,251 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Expendables

Total: 1 t

100% lubricating oil

Equivalent yearly hours of utilization*

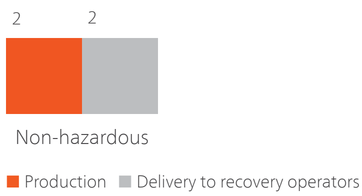
Hydro: **4,397 hours**

* Yearly generation/capacity ratio.

Special waste

Total production: **2 t**

Total delivery to recovery operators: **2 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants (hydro)	**no.**	**3**	**3**	**3**	**3**	**3**
Net maximum electrical capacity (hydro)	**MW**	**56.3**	**52.5**	**52.4**	**52.5**	**52.5**
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.	na	na	na	na	24
vehicles for both private and service use	no.	na	na	na	na	5
Gross real-estate surface area	thousand m^2	na	na	na	na	0.592

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Various activities	thousand toe	na	na	na	na	0.080
	TJ	na	na	na	na	3.35
EN4 **Primary electricity**		na	na	na	na	
Various activities	million kWh	na	na	na	na	0.481
EN1 **Expendables**						
Lubricating oil	t	0.280	0.424	0.541	1.01	1.09
Dielectric oil	t	0.017	0.006	0	0	0
Printing paper	t	na	na	na	na	0.269
Other	t	0	0	0.006	0	0
Total	**t**	**0.297**	**0.430**	**0.547**	**1.01**	**1.36**
for hydro generation	t	0.297	0.430	0.547	1.01	1.09

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables (hydro from natural flows)	**million kWh**	**229**	**235**	**178**	**277**	**231**

na: not available

Emissions

		Source		2007	2008	2009	2010	2011
Emissions into the atmosphere								
EN16	CO_2	various activities	thousand t	0.001	0	0	0	0.234
EN18	**Avoided CO_2 emissions**							
Due to hydro generation from natural flows			thousand t	140	144	109	154	128
EN22	**Non-hazardous special waste**	electricity generation						
production			t	4.80	0.269	0	1.22	1.75
delivery to recovery operators			t	0	0.199	0.002	1.19	1.91
EN22	**Hazardous special waste**							
production		electricity generation	t	0.492	0.596	0	0.931	0.078
of which with PCBs				*0.297*	*0.402*	*0*	*0.883*	*0*
		various activities	t	0	0	0	0	0.001
delivery to recovery operators		electricity generation	t	0.331	0.507	0	0.158	0
of which with PCBs			*t*	*0.208*	*0.339*	*0*	*0.158*	*0*
EN22	**Total special waste**							
production		electricity generation	t	5.29	0.865	0	2.15	1.83
		various activities	t	0	0	0	0	0.001
delivery to recovery operators			t	0.331	0.706	0.002	1.35	1.91

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
hydro from natural flows	% of total generation	100	100	100	100	100	0	0
EN22 **Waste recovery**								
Non-hazardous special waste								
electricity generation	% of production	0	74	0	97.5	109	0	11.8
Hazardous special waste								
electricity generation	% of production	67.3	85.1	0	17	0	-100	-100
Total special waste								
electricity generation	% of production	6.26	81.6	0	62.7	105	1,577	67.5

Highlights of 2011

Enel operates in Mexico through Enel Green Power (hydro power generation in central Mexico).

Total hydro generation was down by 16% on 2010.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to about 128,000 tonnes, roughly 17% less than in the previous year.

EN19 Ozone-depleting substances:

R22

Emissions: **208 kg**, measured on the basis of gas replenishments in the air conditioning system and **equivalent to 11.439 kg of CFC11**.

EN22 The recovery of waste sharply increased, reaching 100%.

EN26 Environmental enhancements.

Air

> A system was put in place to monitor leakage of the ozone-depleting R22 gas used in the air conditioning system.

Waste

> A scheme was introduced for separate collection of waste produced in hydro plants and offices.

> Separate collection of plastic waste from the basin of the El Gallo plant and delivery to recovery operators.

Panama

Hydro power generation

Enel Green Power SpA

The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
1	300	1,543

Power installations

	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Pondage/reservoir	**1**	**1**	**300**

The Fortuna power plant is ISO 14001-certified.

Wind power generation

Total: 300 MW

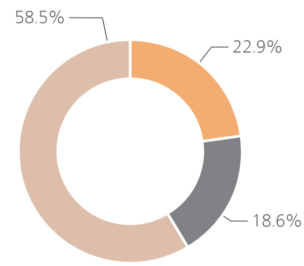
Equivalent yearly hours of utilization*

Hydro: **5,142 hours**

* Yearly generation/capacity ratio.

Expendables

Total: 14 t



Net electricity generation

Total: 1,543 million kWh

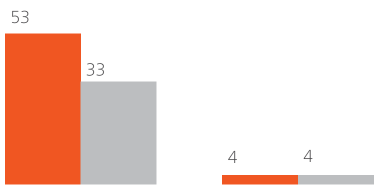
Avoided CO_2 emissions

Due to hydro generation from natural flows: **857,162 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Special waste

Total production: **57 t**
Total delivery to recovery operators: **37 t**



Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants (hydro)	**no.**	**1**	**1**	**1**	**1**	**1**
Net maximum electrical capacity (hydro)	**MW**	**300**	**300**	**300**	**300**	**300**
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.				47	46

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Real-estate & service management	thousand toe	0.001	0.001	0	0.109	0.121
	TJ	0.042	0.042	0	4.56	5.07
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0.010	0.013
EN1 **Expendables**						
Lubricating oil	t	8.86	8.86	4.07	3.87	3.26
Dielectric oil	t	0	0	0	0	2.64
Other	t	0	0	0	0	8.32
Total	**t**	**8.86**	**8.86**	**4.07**	**3.87**	**14.2**

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From renewables (hydro from natural flows)	**million kWh**	**1,438**	**1,754**	**1,792**	**1,793**	**1,543**

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN16 CO_2	Real-estate management, vehicles and services	thousand t	0.002	0.002	0	0.336	0.370
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows	thousand t		881	1,075	1,098	996	857
EN22 **Non-hazardous special waste**							
production	electricity generation	t	0	0	10.4	47.3	53.1
	various activities	t	0	0	0	0.754	0.645
	Total	**t**	**0**	**0**	**10.4**	**48.0**	**53.7**
delivery to recovery operators	electricity generation		0	0	8.75	31.7	32.6

	Source		2007	2008	2009	2010	2011
EN22 **Hazardous special waste**							
production	electricity generation	t	1.50	12.0	0	4.81	4.40
	real-estate & service management	t	0	0	0	4.14	4.25
	Total	**t**	**1.50**	**12.0**	**0**	**8.95**	**8.65**
of which with PCBs			*0*	*0*	*0*	*2.64*	*2.35*
delivery to recovery operators	electricity generation	t	1.50	12.0	0	4.81	4.40
of which with PCBs		*t*	*0*	*0*	*0*	*2.64*	*2.35*
EN22 **Total special waste**							
production	electricity generation	t	1.50	12.0	10.4	52.1	57.5
	real-estate & service management	t	0	0	0	4.89	4.89
	Total	**t**	**1.50**	**12.0**	**10.4**	**57.0**	**62.4**
delivery to recovery operators	electricity generation	t	1.50	12.0	8.75	36.5	37.0

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
Electricity generation from renewables								
hydro from natural flows	% of total generation	100	100	100	100	100	0	0
EN22 **Waste recovery**								
Non-hazardous special waste								
electricity generation	% of production	0	0	84.1	67.0	61.4	0	-8.40
Hazardous special waste								
electricity generation	% of production	100	100	0	100	100	0	0
Total special waste								
electricity generation	% of production	100	100	84.1	70.1	64.4	-35.6	-8.10

Highlights of 2011

Total hydro power generation was down by approximately 14% on 2010.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to about 857,000 tonnes, roughly 14% less than in the previous year.

EN22 The few items of waste produced and their limited amounts cause relatively strong fluctuations in their production and recovery over the years. However, waste recovery remained at high values (64%).

Enel operates in Panama through Enel Green Power (hydro power generation).

Peru

Thermal power generation

Endesa SA

The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
3	1,035	5,225

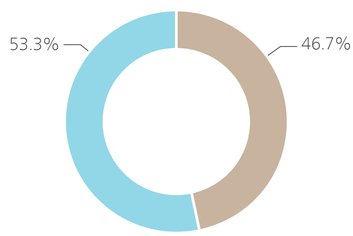
Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW
Combined-cycle gas turbines	1	3	483
Single-cycle gas turbines	2	7	552
	3	**10**	**1,035**

All the power plants are ISO 14001-certified.

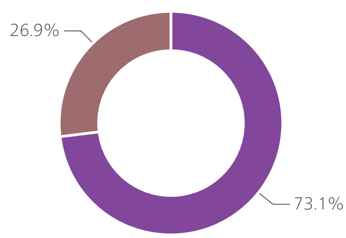
Net electricity generation
Total: 5,225 million kWh

Net maximum electrical capacity
Total: 1,035 MW



Combined-cycle gas turbines
Gas turbines

Water for industrial uses
Total requirements: 185,406 m^3
Total abstraction from inland waters: 185,406 m^3



From wells
From aqueducts

Waste waters

1,556,700 m^3

Discharged

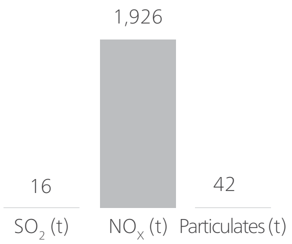
Waste waters include those meteoric waters that are susceptible to pollution and are therefore fed to treatment systems before being discharged or used.

Fuel consumption

Total: **1,060,868 t of oil equivalent**

100% natural gas

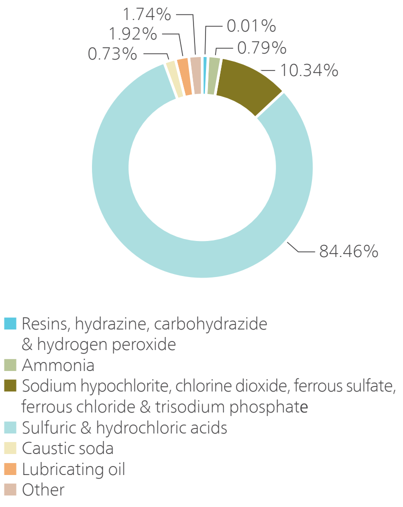
Emissions into the atmosphere



CO_2: **2,124,858 t**

Expendables

Total: 810 t



Special waste

Total production: **549 t**

Total delivery to recovery operators: **276 t**

Non-hazardous

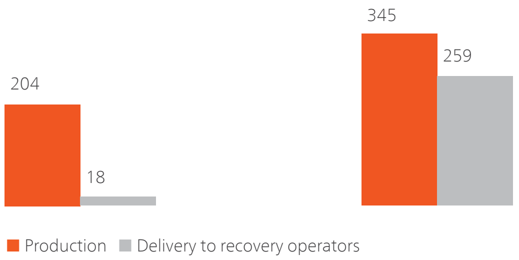
Production: 204 t

Delivery to recovery operators: 18 t

Hazardous

Production: 345 t

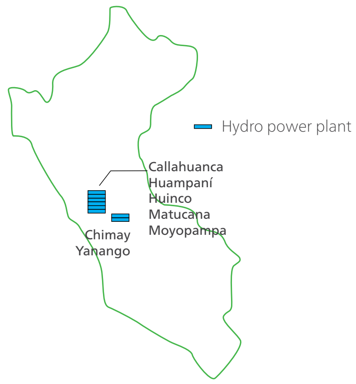
Delivery to recovery operators: 259 t



Peru

Hydro power generation

Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
7	739	4,615

Power installations

HYDRO	Power plants no.	Head installations no.	Net maximum electrical capacity MW
Run-of-river	5	12	345
Pondage/reservoir	2	6	394
	7	**18**	**739**

All the power plants are ISO 14001-certified.

Net electricity generation

Total: 4,615 million kWh

Equivalent yearly hours of utilization*

Hydro: **6,244 hours**

* Yearly generation/capacity ratio. For Endesa generation is considered to refer to the entire year.

Expendables

Total: 2.7 t

100% lubricating oil

Avoided CO_2 emissions

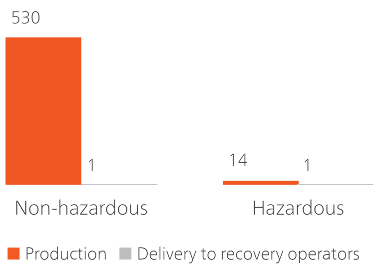
Due to hydro generation from natural flows: **1,876,475 t**

Emissions from the otherwise necessary fossil-fired thermal generation.

Special waste

Total production: **544 t**

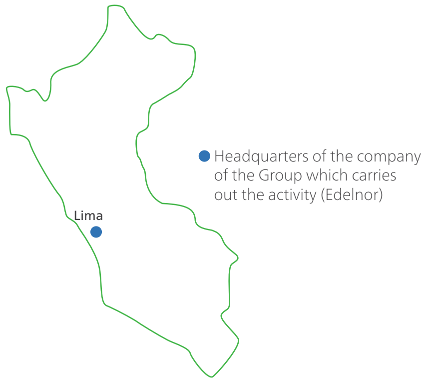
Total delivery to recovery operators: **2 t**



Peru

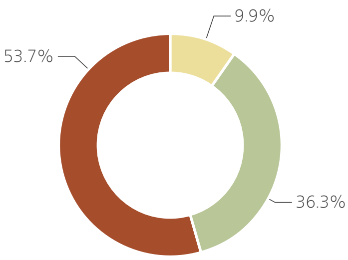
Electricity distribution

Endesa SA



The Numbers

Substations	Capacity (MVA)	Total lines (km)
8,672	2,989	24,144



Power installations

SUBSTATIONS	no.	Installed transforming capacity MVA
HV/MV	26	1,523
MV/LV	8,643	1,443
MV/MV	3	23
	8,672	**2,989**

LINES (length in km)	Overhead bare conductors	Overhead cables	Underground cables	Total
HV	425	-	40	**464**
MV	1,978	0	1,876	**3,854**
LV	0	8,768	11,058	**19,826**
	2,301	**8,768**	**12,974**	**24,144**

The organization is ISO 14001-certified.

General data

Municipalities served: **57**

Surface area served: **1,517 km^2**

Customers connected to the grid: **1,144,034**

(of which supplied by companies of the Group: **1,144,020**)

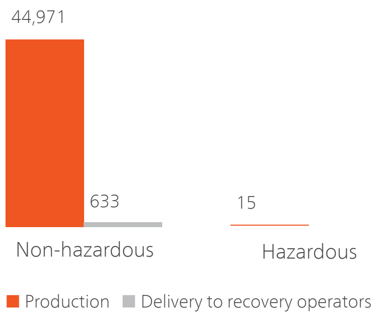
Resource consumption

Expendables: **3.5 t**

Special waste

Total production: **44,986 t**

Total delivery to recovery operators: **633 t**



Electricity

Total electricity distributed:
6,572 million kWh

Own consumption for grid operation:
10 million kWh

Emissions into the atmosphere

SF_6: **23 kg (524 t of CO_2 equivalent)**

Environmental Results

Status data

		2007	2008	2009	2010	2011
Power-generating installations						
Power plants	no.	7	10	10	10	10
thermal	no.	2	2	3	3	3
hydro	no.	5	8	7	7	7
Net maximum electrical capacity	MW	1,082	1,071	1,774	1,775	1,774
thermal	MW	583	572	1,037	1,037	1,035
hydro	MW	499	499	737	739	739
Power lines (circuit-length)						
Total	km	14,338	14,723	22,741	23,378	24,144
high-voltage	km	281	285	436	449	464
medium-voltage	km	2,249	2,333	3,597	3,694	3,854
low-voltage	km	11,808	12,104	18,708	19,234	19,826
EN29 **Real-estate & service management**						
Vehicle fleet						
service vehicles	no.	0	0	0	0	324
special vehicles	no.	0	0	0	0	2
Gross real-estate surface area	thousand m^2	0	0	0	0	51.1

Resources

		2007	2008	2009	2010	2011
EN1 EN3 **Fossil fuels**						
Thermal generation						
gas oil	thousand t	0.344	20	4.81	0.417	0.712
	thousand toe	0.348	20.6	4.73	0.461	0.733
natural gas	million m^3	151	701	942	1,106	1,219
	thousand toe	140	613	822	961	1,060
technologically captive use	*million m^3*	*151*	*701*	*942*	*1,085*	*1,196*
	thousand toe	*140*	*613*	*822*	*942*	*1,040*
of which in combined-cycle units	million m^3	0	454	609	596	595
	thousand toe	0	397	534	520	519
non-technologically captive use	*million m^3*	*0*	*0*	*0*	*21*	*22.7*
	thousand toe	*0*	*0*	*0*	*18.3*	*19.8*
Total	thousand toe	141	634	827	961	1,061
	TJ	5,890	26,536	34,614	40,236	44,416
Real-estate & service management	thousand toe	0	0	0	0	0.040
Grand total	**thousand toe**	**141**	**634**	**827**	**961**	**1,061**
	TJ	**5,890**	**26,536**	**34,614**	**40,236**	**44,418**

		2007	2008	2009	2010	2011
EN4 Primary electricity						
Real-estate & service management	million kWh	0	0	0	0	4.08
EN8 Water for industrial uses						
From wells	million m^3	0.062	0.160	0.131	0.146	0.135
From aqueducts	million m^3	0	0	0.072	0.041	0.050
Total abstraction from inland waters	**million m^3**	**0.062**	**0.160**	**0.203**	**0.187**	**0.185**
for thermal generation	million m^3	0.062	0.160	0.203	0.187	0.185
EN8 EN21 Open-cycle cooling water						
For thermal generation	million m^3	0.494	0	3.17	2.83	3.23
Water for non-industrial uses						
Real-estate & service management	million m^3	0	0	0	0	0.011
EN1 Expendables						
Hydrazine	t	0	0.198	0.220	0.230	0.120
Ammonia	t	0	4.94	6.37	7.09	6.37
Sodium hypochlorite	t	0	42.3	90.6	82.9	83.8
Sulfuric & hydrochloric acids	t	0	455	665	588	685
Caustic soda	t	0	2.29	10.5	3.57	5.93
Lubricating oil	t	0.300	8.75	17.0	191	18.3
Dielectric oil	t	0.707	1.11	1.33	2.50	3.50
Printing paper	t	0	0	0	0	0.009
Other	t	0	3.45	21.4	17.1	14.1
Total	**t**	**1.01**	**519**	**812**	**892**	**817**
for thermal generation	t	0	516	804	878	810
for hydro generation	t	0.300	1.62	7.21	9.27	2.72
for electricity distribution	t	0.707	0.925	1.33	4.50	3.50

Processes and products

		2007	2008	2009	2010	2011
Electricity generation (net)						
From fossil fuels (simple)	**million kWh**	**644**	**3,078**	**4,164**	**4,728**	**5,225**
gas oil	million kWh	1.37	87.7	15.9	2.17	2.86
natural gas	million kWh	643	2,991	4,148	4,726	5,223
of which in combined-cycle units	*million kWh*	*0*	*2,242*	*3,179*	*3,040*	*2,153*
From renewables (hydro from natural flows)	**million kWh**	**630**	**2,809**	**4,564**	**4,405**	**4,615**
Total	**million kWh**	**1,274**	**5,887**	**8,728**	**9,133**	**9,840**
Electricity distribution						
Electricity distributed	million kWh	773	4,090	5,716	6,126	6,572
EN4 Electricity consumption for grid operation	million kWh	1.26	5.81	10.0	9.76	9.91

Emissions

	Source		2007	2008	2009	2010	2011
Emissions into the atmosphere							
EN20 SO_2	thermal generation	thousand t	0.009	0.136	0.096	0.073	0.016
EN20 NO_X	thermal generation	thousand t	0.420	1.88	2.48	2.18	1.93
EN20 Particulates	thermal generation	thousand t	0.014	0.069	0.087	0.104	0.042
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	287	1,473	1,671	1,959	2,125
	various activities	thousand t	0	0.056	0	0.086	0.102
EN16 SF_6	electricity distribution	kg	0.335	0	5.50	51.5	23.0
		thousand t of CO_2 equivalent	0.008	0	0.125	1.17	0.524
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		thousand t of CO_2 equivalent	**287**	**1,473**	**1,671**	**1,960**	**2,125**
EN18 **Avoided CO_2 emissions**							
Due to hydro generation from natural flows		thousand t	280	1,343	1,832	1,825	1,876
EN21 **Waste waters (discharged quantity)**	thermal generation	million m^3	0	0.065	0.039	0.083	1.56
EN22 **Non-hazardous special waste**							
production	electricity generation	t	49.9	164	798	731	734
	electricity distribution	t	88.1	307	2,489	35,305	44,971
	Total	**t**	**138**	**471**	**3,287**	**36,036**	**45,704**
delivery to recovery operators	electricity generation	t	0.180	0.020	0.762	21.0	18.4
	electricity distribution	t	84.8	291	555	1,364	633
	Total	**t**	**85.0**	**291**	**556**	**1,385**	**652**
EN22 **Hazardous special waste**							
production	electricity generation	t	37.6	72.3	217	377	359
	electricity distribution	t	6.13	7.35	17.8	25.1	15.3
	various activities	t	0	0	0	0	4.58
	Total	**t**	**43.7**	**79.7**	**235**	**402**	**379**
of which with PCBs	*electricity generation*	*t*	*0*	*12.3*	*5.57*	*54.6*	*4.13*
	electricity distribution	*t*	*0*	*2.73*	*2.91*	*5.26*	*3.46*
	various activities	*t*	*0*	*0*	*0*	*0*	*1.23*
	Total	***t***	***0***	***15.1***	***8.48***	***59.8***	***8.82***
delivery to recovery operators	electricity generation	t	1	12.4	76.5	1.86	260
	electricity distribution	t	0.671	2.73	2.91	5.21	0
	Total	**t**	**1.67**	**15.2**	**79.4**	**7.07**	**260**
of which with PCBs	*electricity generation*	*t*	*0*	*12.3*	*5.06*	*1.86*	*4.13*
	electricity distribution	*t*	*0*	*2.73*	*2.91*	*5.00*	*0*
	Total	***t***	***0***	***15.1***	***7.97***	***6.86***	***4.13***
EN22 **Total special waste**							
production	electricity generation	t	87.5	236	1,015	1,108	1,093
	electricity distribution	t	94.2	314	2,507	35,330	44,986
	various activities	t	0	0	0	0	4.58
	Total	**t**	**182**	**550**	**3,522**	**36,438**	**46,084**
delivery to recovery operators	electricity generation	t	1.18	12.4	77.3	22.9	278
	electricity distribution	t	85.5	294	558	1,369	633
	Total	**t**	**86.7**	**306**	**635**	**1,392**	**912**

Indicators

		2007	2008	2009	2010	2011	% ('11-'07)/'07	% ('11-'10)/'10
EN29 Land								
LV cable lines								
overhead	% of entire LV grid	40.9	41.9	42.6	43.2	44.2	8.10	2.30
underground	% of entire LV grid	59.1	58.1	57.4	56.8	55.8	-5.60	-1.80
Total	**% of entire LV grid**	**100**	**100**	**100**	**100**	100	0	0
MV cable lines								
overhead	% of entire MV grid	2.21	1.86	1.86	1.81	0	-100	-100
underground	% of entire MV grid	46.1	46.7	47.5	47.1	48.7	5.60	3.40
Total	**% of entire MV grid**	**48.4**	**48.6**	**49.4**	**48.9**	48.7	0.600	-0.400
Overhead and underground cables in HV+MV+LV distribution lines	% of total distribution grid	90.1	90	90.2	90.2	90	-0.100	-0.200
Resource conservation and quality								
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	2,183	2,059	1,986	2,033	2,030	-7.00	-0.100
EN4 Consumption of electricity for distribution grid operation	% of electricity distributed	0.163	0.142	0.175	0.159	0.151	-7.40	-5.00
EN8 Net specific requirements of water for industrial uses in thermal generation								
including contribution of as-is sea water	liters/kWh	0.096	0.052	0.049	0.040	0.035	-63.5	-12.5
excluding contribution of as-is sea water	liters/kWh	0.096	0.052	0.049	0.040	0.035	-63.5	-12.5
EN8 Coverage of requirements of water for industrial uses								
from wells	% of requirements	100	100	64.5	78.1	73.0	-27.0	-6.50
from aqueducts	% of requirements	0	0	35.5	21.9	27.0	0	23.3
Total from inland waters	**% of requirements**	**100**	**100**	**100**	**100**	**100**	**0**	**0**
EN1 EN3 Fossil fuel consumption for thermal generation								
gas oil	% of total fuel consumption	0.247	3.25	0.572	0.048	0.069	-72.1	43.8
natural gas	% of total fuel consumption	99.8	96.8	99.4	100	99.9	0.100	-0.100
natural gas, technologically captive use	% of total natural gas consumption	100	100	100	98.1	98.1	-1.90	0
of which in combined-cycle units	*% of total natural gas consumption*	*0*	*64.7*	*64.9*	*54.1*	*49.0*	*0*	*-9.40*
natural gas, non-technologically captive use	% of total natural gas consumption	0	0	0	1.90	1.87	0	-1.60
Electricity generation from renewables								
hydro from natural flows	% of total generation	49.4	47.7	52.3	48.2	46.9	-5.10	-2.70
Specific emissions into the atmosphere								
EN20 SO_2 (thermal generation)	g/kWh thermal net	0.014	0.044	0.023	0.015	0.003	-78.6	-80.0
EN20 NO_X (thermal generation)	g/kWh thermal net	0.652	0.609	0.597	0.461	0.369	-43.4	-20.0
EN20 Particulates (thermal generation)	g/kWh thermal net	0.022	0.022	0.021	0.022	0.008	-63.6	-63.6
EN16 CO_2 (thermal generation)	g/kWh thermal net	445	478	401	414	407	-8.50	-1.70
EN20 SO_2 (total from thermal generation)	g/kWh total net	0.007	0.023	0.011	0.008	0.002	-71.4	-75.0
EN20 NO_X (total from thermal generation)	g/kWh total net	0.330	0.319	0.285	0.239	0.196	-40.6	-18.0
EN20 Particulates (total from thermal generation)	g/kWh total net	0.011	0.012	0.010	0.011	0.004	-63.6	-63.6
EN16 CO_2 (total from thermal generation)	g/kWh total net	225	250	191	214	216	-4.00	0.900
EN16 SF_6 (electric activities)	% of SF_6 in equipment or in stock	0.035	0	0.297	2.39	1.45	4,042	-39.3
EN22 Waste recovery								
Non-hazardous special waste								
electricity generation	% of production	0.360	0.012	0.095	2.88	2.51	597	-12.8
electricity distribution	% of production	96.3	94.7	22.3	3.86	1.41	-98.5	-63.5
Total	**% of production**	**61.6**	**61.8**	**16.9**	**3.84**	**1.43**	**-97.7**	**-62.8**
Hazardous special waste								
electricity generation	% of production	2.66	17.2	35.3	0.492	72.3	2,618	14,595
electricity distribution	% of production	10.9	37.1	16.4	20.8	0	-100	-100
Total	**% of production**	**3.82**	**19**	**33.9**	**1.76**	**69.4**	**1,716**	**3,843**
Total special waste								
electricity generation	% of production	1.35	5.27	7.62	2.07	25.5	1,788	1,131
electricity distribution	% of production	90.7	93.4	22.3	3.87	1.41	-98.4	-63.6
Total	**% of production**	**47.7**	**55.6**	**18.0**	**3.82**	1.98	**-95.8**	**-48.2**

Highlights of 2011

Enel operates in Peru through Endesa (hydro and thermal power generation, electricity distribution and sale).

Overall generation was up by 700 GWh: fossil-fired generation was up by ~500 GWh, whereas hydro generation was up by ~200 GWh.

EN1 EN3 The fuel mix (including, exclusively, gas and gas oil, the latter only for plant start-up) remained practically unaltered.

EN1 EN3 EN5 The net heat rate of simple thermal generation stood steady.

EN8 Net specific requirements of water for industrial uses in thermal generation decreased by about 12.5% (from 0.04 to 0.035 l/kWh).

EN16 The constant reduction of the thermal plant capacity load factor caused net specific emissions of CO_2 to mount slightly (from 214 to 216 g/kWh, i.e. +~0.7%).

EN20 The decrease of net specific emissions of macro-pollutants (SO_2, NO_X and particulates) of ~80%, ~20% and ~64%, respectively, was due to a lower amount of gas oil used in plant start-up.

EN18 CO_2 emissions displaced by electricity generation from renewables amounted to approximately 1.9 million tonnes, in line with their value in 2010.

EN19 Ozone-depleting substances:

R22

Emission: **11 kg**, measured on the basis of gas replenishments in the air conditioning system (Malacas thermal plant) and **equivalent to 0.605 kg of CFC11**.

EN23 21 m^3 of oil spilled from the Santa Rosa plant. Timely emergency remediation works produced approximately 21 m^3 of sludges and 24 t of contaminated soil, which were delivered to decontamination operators.

EN26 Environmental enhancements.

Water

- Electricity distribution (Edelnor): monthly monitoring of the quality of water outgoing from mini hydro plants to detect pollution.
- Electricity distribution (Edelnor): water-saving awareness & training scheme.
- Santa Rosa plant: works for recovery of waste waters in view of their use for irrigation.

Materials and resources

- Electricity distribution (Edelnor): the damaged towers of low-voltage lines (712 in 2011) and medium-voltage lines (8 in 2011) were repaired instead of being replaced. The repair avoided the construction of new towers with consequent savings in terms of resources (water, aggregates, concrete and iron).

Waste

- Electricity distribution (Edelnor): 144 analyses were conducted on transformers to detect PCBs. Next year, 360 transformers will be analyzed. No PCBs have been detected so far.

Noise

- Electricity distribution (Edelnor): some worn transformer fans were replaced.

Liquid releases

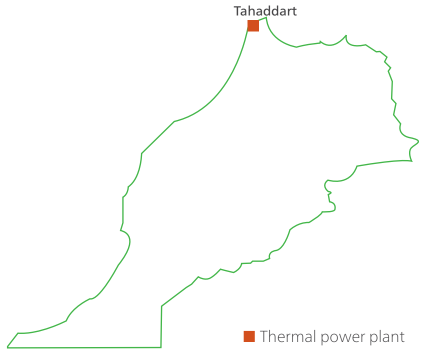
- A trap tank was installed to contain oil in the Chancay substation.

Africa

Morocco

Thermal power generation

Endesa SA



The Numbers

Power plants	Net capacity (MW)	Generation (million kWh)
1	123	745

Power installations

	Power plants no.	Units no.	Net maximum electrical capacity MW
Combined-cycle gas turbines	**1**	**1**	**123**

The Tahaddart power plant is ISO 14001-certified for a total capacity of 123 MW.

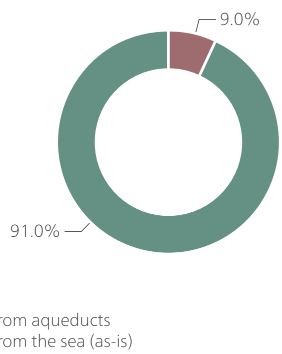
Net electricity generation

Total: 745 million kWh

Water for industrial uses

Total requirements: 213,000 m³

Total abstraction from inland waters: 19,000 m³



Waste waters

16,349 m^3

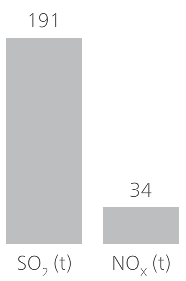
Discharged

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

Fuel consumption

Total: **109,517 t of oil equivalent**

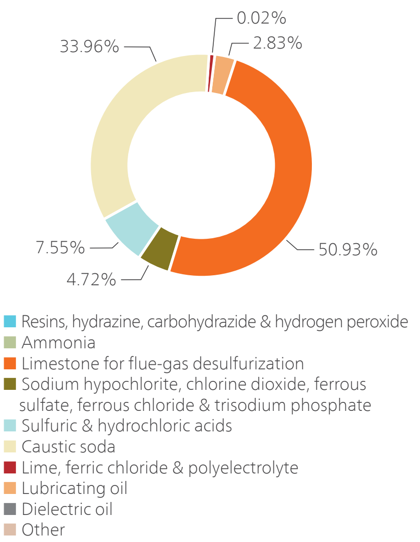
Emissions into the atmosphere



CO_2: **273,696 t**

Expendables

Total: 34 t



Special waste

Total production: **30 t**

Total delivery to recovery operators: **10 t**

Non-hazardous

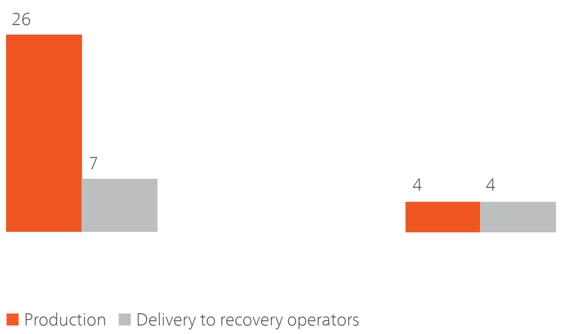
Production: 26 t

Delivery to recovery operators: 7 t

Hazardous

Production: 4 t

Delivery to recovery operators: 4 t



Environmental Results

Status data

		2010	2011
Power-generating installations			
Power plants (thermal)	**no.**	**1**	**1**
Net maximum electrical capacity (thermal)	**MW**	**123**	**123**

Resources

		2010	2011
EN1 EN3 **Fossil fuels**			
Thermal generation			
natural gas - technologically captive use in combined-cycle units	million m^3	119	123
	thousand toe	107	110
	TJ	4,465	4,585
EN8 **Water for industrial uses**			
From aqueducts	million m^3	0.019	0.019
Total abstraction from inland waters	**million m^3**	**0.019**	**0.019**
From the sea (as-is)	million m^3	0.194	0.194
Total requirements	**million m^3**	**0.213**	**0.213**
for thermal generation	million m^3	0.213	0.213
EN1 **Expendables**			
Resins	t	0.016	0
Hydrazine	t	0.096	0.006
Ammonia	t	0.640	0.960
Sodium hypochlorite	t	41.9	17.3
Trisodium phosphate	t	0.064	0
Sulfuric & hydrochloric acids	t	2.24	1.60
Caustic soda	t	2.24	2.56
Other	t	7.68	11.5
Total	**t**	**54.9**	**33.9**
for thermal generation	t	54.9	33.9

Processes and products

		2010	2011
Electricity generation (net)			
From fossil fuels (natural gas)	million kWh	689	745

Emissions

	Source		2010	2011
Emissions into the atmosphere				
EN20 SO_2	thermal generation	thousand t	0.191	0.191
EN20 NO_X	thermal generation	thousand t	0.034	0.034
EN16 CO_2	fossil-fired thermal generation (from combustion)	thousand t	267	274
EN16 Total greenhouse gases (CO_2, SF_6, CH_4)		thousand t of CO_2 equivalent	**267**	**274**
EN21 **Waste waters (discharged quantity)**	thermal generation	million m^3	0.007	0.016
EN21 **Conventional polluting load of waste waters discharged by plants**				
Metals and compounds (expressed as metal equivalents)	thermal generation	kg	4,187	4,999
	in some plants with an overall capacity of	MW	371	123
EN22 **Non-hazardous special waste**	electricity generation			
production		t	16.0	26.2
delivery to recovery operators		t	0	6.53
EN22 **Hazardous special waste**	electricity generation			
production		t	0.506	3.77
of which with PCBs		*t*	*0.506*	*3.20*
delivery to recovery operators		t	0	3.77
of which with PCBs		*t*	*0*	*3.20*
EN22 **Total special waste**	electricity generation			
production		t	16.5	30.0
delivery to recovery operators		t	0	10.3

Indicators

		2010	2011	% ('11-'10)/'10
Resource conservation and quality				
EN1 EN3 Net heat rate of thermal generation	kcal/kWh	1,547	1,469	-5.00
EN8 Net specific requirements of water for industrial uses in thermal generation				
including contribution of as-is sea water	liters/kWh	0.309	0.286	-7.40
excluding contribution of as-is sea water	liters/kWh	0.028	0.025	-10.7
EN8 Coverage of requirements of water for industrial uses				
from aqueducts	% of requirements	8.92	8.92	0
Total from inland waters	**% of requirements**	**8.92**	**8.92**	**0**
from the sea (as-is)	% of requirements	91.1	91.1	0
EN1 EN3 Fossil fuel consumption for thermal generation				
natural gas	% of total fuel consumption	100	100	0
natural gas, technologically captive use	% of total natural gas consumption	100	100	0
of which in combined-cycle units	*% of total natural gas consumption*	*100*	*100*	*0*
Specific emissions into the atmosphere				
EN20 SO_2 (thermal generation)	g/kWh thermal net	0.277	0.256	-7.60
EN20 NO_X (thermal generation)	g/kWh thermal net	0.049	0.046	-6.10
EN16 CO_2 (thermal generation)	g/kWh thermal net	387	367	-5.20
EN20 SO_2 (total from thermal generation)	g/kWh, total net	0.277	0.256	-7.60
EN20 NO_X (total from thermal generation)	g/kWh total net	0.049	0.046	-6.10
EN16 CO_2 (total from thermal generation)	g/kWh, total net	387	367	-5.20
Net specific conventional polluting load of waste waters discharged by plants (thermal generation)				
Metals and compounds (expressed as metal equivalents)	mg/kWh thermal net	1.94	6.71	245
EN22 **Waste recovery**				
Non-hazardous special waste				
electricity generation & geothermal drilling	% production	0	24.9	0
Hazardous special waste				
electricity generation & geothermal drilling	% production	0	100	0
Total special waste				
electricity generation & geothermal drilling	% production	0	34.4	0

Highlights of 2011

Enel operates in Morocco through Endesa (thermal power generation).

In 2011, generation in the CCGT plant (the only plant) was up by about 56 GWh.

EN1 EN3 EN5 The net heat rate of thermal generation was down by 5%, thanks to better distribution of generating output.

EN8 Water requirements were mainly covered by sea water (91% of the total). Specific requirements were down by 7.4% on 2010 as a result of the initiatives better described under EN26.

EN22 Waste management initiatives, better described under EN26, made it possible to reach 34% of waste recovery.

EN26 Environmental enhancements.

Water

> Water saving thanks to employees' and contractors' awareness actions.

Materials and resources

> Paper saving through employees' awareness actions.

Waste

> Identification of waste categories and waste segregation by better managing storage areas, labeling waste items with appropriate tags and purchasing equipment for preliminary treatment (shredder of vegetable waste, presses for plastics, paper, cardboard and aluminum).

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