### Environment: general data

#### EUROPE

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#### LATIN AMERICA

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#### NORTH AMERICA

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<tr>
<td>United States</td>
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#### AFRICA AND NEW COUNTRIES

<table>
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<th>Page</th>
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<tbody>
<tr>
<td>India</td>
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<tr>
<td>South Africa</td>
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Environment: general data

Net installed capacity 2015

<table>
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<tr>
<th>Source</th>
<th>MW</th>
<th>Geographic Area</th>
</tr>
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<tbody>
<tr>
<td>Thermoelectric</td>
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<td>Europe*</td>
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<td>Renewable</td>
<td>37,033</td>
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<td>Nuclear</td>
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Energy production 2015

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<th>Source</th>
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<td>Nuclear</td>
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Length of the grid

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<tr>
<th>Voltage Level</th>
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<td>Low voltage</td>
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Country | Plants | Cabins |
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North America

Country | Plants | Cabins |
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<td>Canada</td>
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Latin America

Country | Plants | Cabins |
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</tbody>
</table>

Europe*

Country | Plants | Cabins |
<table>
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</thead>
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<tr>
<td>India</td>
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</tbody>
</table>

* Includes Russia, South Africa and India

The number of plants indicated may vary in the individual country sheets due to differing aggregation criteria used on the basis of organizational and non-operational criteria.
BELGIUM

Thermoelectric production

Marcinelle Energie SA
Significant events in 2015

Enel operates in Belgium with Marcinelle Energie SA in thermoelectric production. In 2015 production rose compared to previous years following the greater demand from the electricity market. Consequently, the consumption of industrial water and consumables also rose, except for some specific materials, such as for example polyelectrolyte (which fell from around 5% of consumables in 2014 to 1.7% in 2015) which is used in place of the previous system of batteries.

Special waste fell from 169 t to 153 t. The total transferred for recovery was 100%.
**Significant events in 2015**

Enel operates in Belgium with Marcinelle Energie SA in thermoelectric production.

In 2015 production rose compared to previous years following the greater demand from the electricity market. Consequently, the consumption of industrial water and consumables also rose, except for some specific materials, such as for example polyelectrolyte (which fell from around 5% of consumables in 2014 to 1.7% in 2015) which is used in place of the previous system of batteries.

G4-EN23

Special waste fell from 169 t to 153 t. The total transferred for recovery was 100%.
Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.

Emissions avoided are calculated as the sum of the emissions avoided in the various areas taking as a benchmark for the specific CO₂ emission the average thermoelectric production of the individual country taken from the Enerdata database (http://services.enerdata.eu). The figure is the product of the electricity production obtained with each renewable or nuclear source and the specific CO₂ emission from thermoelectric production in the country where Enel operates.

Equivalent annual hours of use* TOTAL: 2,132

*Annual production/power ratio.

Total produced (t) 2

Total transferred for recovery (t) 2
Significant events in 2015

Enel operates in Bulgaria with Enel Green Power in producing wind energy. Enel Green Power owns wind plants for a net maximum capacity of 42 MW.

**G4-EN19**
Wind production enabled the avoidance of the atmospheric emission of more than 111 thousand tons of CO₂.

**G4-EN23**
During 2015 there was a decrease in special waste which went from 4 t in 2014 to 2 t in 2015. The waste transferred for recovery was 100%.
### GREECE

**Production from renewables**

#### THE NUMBERS

- **Power plants**: 50
- **Net power**: 290 MW
- **Production**: 549 million kWh

#### TYPE OF PLANT

<table>
<thead>
<tr>
<th>Power plants</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYDRO</strong></td>
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<tr>
<td>Run-of-the-river</td>
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<tr>
<td>Wind</td>
<td>17</td>
</tr>
<tr>
<td><strong>PHOTOVOLTAIC</strong></td>
<td></td>
</tr>
<tr>
<td>Photovoltaic</td>
<td>17</td>
</tr>
</tbody>
</table>

#### OTHER DATA

- **Wind**: 2,160
- **Photovoltaic**: 1,437
- **Hydro**: 1,362

**Emissions of CO2 avoided (t)**

- **TOTAL**: 497,865

**Equivalent annual hours of use**

- **TOTAL**: 4,848

**Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.**

**Annual production/power ratio.**

#### Non-hazardous waste (t)

- **Total produced**: 82 t
- **Transfered for recovery**: 98 t

#### Hazardous waste (t)

- **Total produced**: 12 t
- **Transfered for recovery**: 8 t

### OTHER DATA

#### WIND PLANT

- **Surface area occupied by lay-bys, roads, buildings**: 116.65 ha

#### PHOTOVOLTAIC PLANT

- **Surface area occupied by modules**: 80.42 ha
- **Total surface area concerned**: 246.89 ha

---

**Lubricant**:

- **TOTAL**: 4.5 t

**Hydropower**:

- **TOTAL**: 290 MW

**Water from natural sources**:

- **TOTAL**: 249 million kWh

**Photovoltaic**:

- **TOTAL**: 549 million kWh

**Consumables**:

- **TOTAL**: 4.5 t
Significant events in 2015

Total net production rose by around 60 GWh, 12% more than in 2014.

In particular wind production rose by 63 GWh, up by 18% on 2014, and photovoltaic production rose by 6 GWh, 6% up on 2014. On the other hand, a fall was recorded in hydroelectric production of around 9 GWh, 25% down on the previous year.

Renewable production (wind, hydroelectric and photovoltaic) enabled the avoidance of atmospheric emissions of around 498 thousand tons of CO₂.

In 2015 there was a reduction in special waste from 90 t in 2014 to 82 t in 2015. There was also an increase in non-hazardous waste transferred for recovery compared to that produced. This difference was due to the transfer for recovery of waste stored in 2014.
**ITALY**

**Thermoelectric production**

- **Net maximum capacity:** 16,743 MW
- **Total:** 43,495 millions of kWh

**Power plants:** 37

**Type of Plant**

- Steam (condensing): 13 sections, 7,558 MW
- Steam with back-up gas turbines: 2 sections, 3,306 MW
- With gas turbines in combined cycle: 7 sections, 5,199 MW
- With gas turbines in simple cycle: 6 sections, 648 MW
- With alternative engines: 9 sections, 32 MW

**Fuel consumption**

- Total: 10,964,197 t (of oil equiv.)
- Steam: 84.02%
- Steam with back-up gas turbines: 3.87%
- Combined cycle: 45.15%
- With gas turbines in simple cycle: 14.29%
- With alternative engines: 0.70%
- Oil: 0.70%
- Natural gas: 0.29%
- Coal: 0.19%

**Waste water**

- Discharged (m³): 4,404,000
- Used inside plant (m³): 5,882,000

**ATMOSPHERIC EMISSIONS**

- **NOx (t):** 17,300
- **SO2 (t):** 13,727
- **Particulate matter (t):** 474
- **CO2 (t):** 37,549,100
- **Thermoelectric production from fossil fuels (from combustion):** 37,413,697
- **Thermoelectric production from fossil fuels (from desulphurization):** 135,403
- **SF6 (kg):** 362
  - (t equiv. of CO2): 8,034
- **Total (t equiv. of CO2):** 37,557,134

**Water for industrial use**

- **Total requirement:** 19,281,012 m³
- **Total fresh water drawn off:** 7,336,687 m³
- From rivers (including subsequent rain water): 8.67%
- From the sea (amount used as such): 22.04%
- From the sea (desalinated amount): 22.77%
- From waste water (amount used inside plants): 30.51%
- From aqueducts: 10.55%
- From wells: 5.46%

**Consumables**

- Total produced: 2,080,080 t
- Total transferred for recovery: 1,838,219 t

**Special waste**

- Total produced: 4,151 t
- Total transferred for recovery: 2,618 t

**Non-hazardous waste**

- Total produced: 2,075,929 t
- Total transferred for recovery: 1,835,601 t

**Hazardous waste**

- Total produced: 4,151 t
- Total transferred for recovery: 2,618 t
**Production from renewables**

**Net maximum capacity**

- TOTAL: 13,932 MW
- Hydroelectric: 5.46%
- Geothermal: 5.17%
- Solar (photovoltaic): 0.32%
- Wind: 89.05%
- Geothermal cement: 5.46%
- Barite: 0.46%
- Bentonite: 2.72%
- Other: 4.70%
- Caustic soda: 4.66%
- Other: 86.38%

**Consumables**

- TOTAL: 85,971 t
- Hydrochloric acid: 0.84%
- Lubricant: 0.46%
- Dielectric oil: 2.72%
- Other: 4.70%
- Caustic soda: 4.66%
- Other: 86.38%

**Equivalent annual hours of use**

- TOTAL: 15,870

**Emissions of CO2 avoided (t)**

- TOTAL: 13,494,267
- Wind: 608,161
- Hydroelectric from natural sources: 9,738,217
- Geothermal: 3,148,079
- Solar (photovoltaic): 93,412
- Biomass: 6,387

**Atmospheric emissions**

- TOTAL: 2,020,489 t
- F6 (all the segments) (kg): 401 (increase on 2014 due to re/fills which do not occur every year)
- CO2 (from combustion of gas oil in generators) (t): 9,917
- H2S (from geothermal fluid) (t): 5,560
- CO2 (from geothermal fluid) (t): 1,598,063

*Annual production/power ratio (excluding hydro production from pumping sources).*

In geothermal production for Italy there was a 22% increase compared to 2014 in the consumption of caustic soda. This, aside from being connected to production, is closely connected to reducing H2S. Soda is used to operate AMIS abatement systems and its consumption is proportional to the quantity of H2S removed from the gas and therefore increased consumption indicates a higher level of reduction in H2S. This occurred because in 2015 all the AMIS systems in our power plants came into operation.

**The Numbers**

- **Power plants**: 605
- **Net power**: 13,932 MW
- **Production**: 25,023 million kWh

**Type of plant**

- **Hydroelectric**: Run-of-the-river 315, Basin/reservoir 152, Pure/mixed pumping 16
- **Geothermal**: Condensation 34
- **Wind**: 32
- **Photovoltaic**: 56

**Total**: 605, 534, 13,932

**Power plants**

- Condensation 152
- Pure/mixed pumping 16
- Run-of-the-river 315

**Derivations**

- Condensation 36
- Pure/mixed pumping 17
- Run-of-the-river 321

**Net maximum capacity MW**

- Condensation 761
- Run-of-the-river 1,707
- Pure/mixed pumping 6,973
- Total 13,932
**Italy**

**Production from renewables**

<table>
<thead>
<tr>
<th>TOTAL FLUID EXTRACTED</th>
<th>NET OF REJECTED LIQUIDS</th>
<th>STEAM USED FOR PRODUCTION OF ELECTRICITY</th>
<th>FLUID USED TO TRANSFER HEAT DIRECTLY</th>
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</thead>
<tbody>
<tr>
<td>56,329,000 t</td>
<td>36,809,000 t</td>
<td>47,342,100 t</td>
<td>635,900 t</td>
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**Special waste**

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<thead>
<tr>
<th>TOTAL PRODUCED</th>
<th>TOTAL TRANSFERRED FOR RECOVERY</th>
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</thead>
<tbody>
<tr>
<td>46,755 t</td>
<td>3,322 t</td>
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</tbody>
</table>

**Hydroelectric production**

- **Reservoirs emptied**
  - Quantity: 5
  - Flood sediment moved due to reservoir bed discharges: 132,560 m³
  - Fish ladders: 49

- **Sowing of fish seeds**
  - Quantity: 54
  - Over 109,503 kg, 2,137,085 exemplars

**Geothermal activity**

- **Wells drilled**
  - New: 8
  - Recovered wells: 2
  - Extent of drilling: 25,288 m

- **Existing wells**
  - Quantity: 497
  - For production: 296
  - For reinjection: 63
  - For other uses: 138

**Photovoltaic plant**

- Surface area occupied by modules: 12 ha
- Total surface area concerned: 25.1 ha

**The numbers**

- **Cabins**: 578,836
- **Power (MVA)**: 199,773
- **Total lines (km)**: 1,140,214

*Enel Distribuzione has ISO 14001 certification for its own Environmental Management System extended to the whole organization.*

**Type of plant**

- **Other secondary cabins**: 135,091 (12,371 MVA)
- **Satellite centers and MV sections**: 529 (61 MVA)
- **Primary cabins**: 2,187 (278 MVA)
- **MV/LV secondary cabins**: 441,029 (81,038 MVA)

**Power lines**

- **Total lines**: 1,140,214
- **Overhead lines with bare conductors**: 11
- **Overhead lines**: 19,265
- **Underground lines**: 14,699
- **Total lines**: 351,493

**Installed transformation capacity MVA**

- **Other secondary cabins**: 135,091
- **Satellite centers and MV sections**: 529
- **Primary cabins**: 2,187
- **MV/LV secondary cabins**: 441,029

**Total**: 578,836

**Total power lines**: 199,773
General data

- MUNICIPALITIES SERVED: 7,539
- SURFACE AREA SERVED (km²): 276,324
- CUSTOMERS CONNECTED TO COMPANY NETWORK: 31,574,489

Electricity (millions of kWh)

- DISTRIBUTED IN TOTAL: 226,569
- OWN CONSUMPTION: 31,574,489
- TRANSFERRED FOR RECOVERY: 25,722

Atmospheric emissions

- SF₆ (kg): 4,176
  - The variation in the data also depends on any plant breakdowns or refills
- CO₂ (t): 723
- TOTAL GREENHOUSE GAS (t equiv. of CO₂): 93,430

Consumption of resources

- CONSUMABLES (t): 63
- GAS OIL (toe): 235

Special waste

- TOTAL PRODUCED: 38,759 t
- TOTAL TRANSFERRED FOR RECOVERY: 25,722 t

- Non-hazardous waste (t)
  - PRODUCED: 16,667
  - TRANSFERRED FOR RECOVERY: 16,380

- Hazardous waste (t)
  - PRODUCED: 14,082
  - TRANSFERRED FOR RECOVERY: 9,422

Significant events in 2015

Enel operates in Italy with Enel Produzione in thermolectric and renewable production, with Enel Green Power, SEH and San Floriano Energy in production from renewables, with Enel Distribuzione in electricity distribution and with the Market Division in the sale of electricity and gas.

In 2015 total production fell by 4.6%, with an increase in thermolectric production of 4% compared to 2014 and a fall in production from renewable sources of 16.6%.

G4-EN1

Under consumables there was an increase in the main materials used for thermolectric production, in particular sulfuric and hydrochloric acid. The increase in ammonia for the removal of nitrates was connected to the greater production recorded in 2015.

G4-EN1

Total use in thermolectric production of fossil fuels grew by around 2% due to greater production from coal and natural gas, while there was reduced consumption of oil of 23%.

G4-EN6

The energy saved thanks to the initiatives to reduce energy consumption and increase energy efficiency for 2015 totaled 210 TJ. The installation of new reduced-loss transformers, new cabins and the reconstruction/enhancement of LV/MV power lines, on the basis of Enel Distribuzione’s long-term infrastructure development plan, envisages an annual average saving of around 10,000 transformers in reduced losses. This figure is taken annually from the introduction of such transformers on to Enel Distribuzione’s logistic platforms. The assessment of the reduction in terms of network losses is broken down considering specific parameters linked to the construction/maintenance of plant: new primary/secondary cabins, the reconstruction/enhancement of MV/LV power lines. The model proceeds with due simplifications, determining an equivalent circuit for the HV, MV and LV network, on the basis of which the losses of the main network elements are estimated. Starting from the energy input into the grid, the average current to use the components is calculated and thus the losses related to this current. For the equivalent resistance parameters a weighted average is used on the basis of the types of conductors. Finally, from the lower losses, the energy is worked out on the basis of the use parameters. The inclusion in the distribution system of new cabins (both HV/MV and MV/LV) enables a rationalization and optimization of the lower voltage, thus causing a reduction in the average length and average load of the network itself, leading to a reduction in energy losses. The overhaul of the MV and LV lines is generally carried out by replacing the existing lines with new larger ones, which leads to a reduction in energy losses which are proportional to the resistance and the square of the current.
In 2014 Enel Green Power opened the worksite, at the geothermal power plant “Cornia 2” in the Municipality of Castelnuovo Val di Cecina, in Tuscany, for the realization of the first plant in the world which uses biomass to heat geothermal steam with the aim of increasing energy efficiency and electricity production in the geothermal cycle. It is a significant technological breakthrough since the environmental impact is close to zero: by supplementing a pre-existing industrial site, it maintains the total renewability of the resource and of the cycle and unites two renewable sources for energy production which opens up new international possibilities. Specifically, the additional power will be 5 MW for a plant which currently has installed power of 13 MW and which may increase the level of production by around 37 GWh per annum. Overall, the operation will enable a further saving in CO2 of 17 thousand tons per annum.

During 2014 the Market Division enhanced its commitment to the dissemination of products and services aimed at sustainable development, energy efficiency and raising awareness on the issue of energy saving. New activities were developed aimed both at residential customers and businesses, in order to direct their consumption towards greater overall efficiency, reducing waste and minimizing the impact on the environment.

Compared to 2014 there was a fall in specific water consumption of 7%.

Total net specific emissions of CO2 in other words for all electricity production, rose from 498 to 549 g/kWh (+10%) owing to the greater thermoelectric production from coal and the reduction in production from renewable sources.

In 2015 CO2 emissions avoided due to production from “carbon free” sources totaled around 14 million tons.

The use of plant with more efficient systems to reduce pollutants led to the fall in net specific emissions in reference to thermoelectric production alone of SO2, NOx and particulate matter. The specific emissions of H2S from geo-thermoelectric production continued to fall thanks to the effect of the “AMIS” abatement systems, falling by 24% compared to 2014.

The production of waste rose by around 4% compared to 2014. Compared to previous years there was an increase in waste transferred for recovery of 5%, in particular heavy coal ash (+24%), light coal ash (5%) and gypsum from desulfurization. Excluding the ash produced in the Sulcis group 2 thermoelectric plant, all the ash produced in Italy is sold or recovered.

Spills mainly from PTP transformers, following tampering/theft. Such accidental spills, which mainly affect small areas, fall within the scope of application of the simplified recovery procedure, in accordance with art. 249 of Leg. Decree 152/06.

Quantity m³: 54

Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of such impacts.

Emissions: work continues to improve the abatement systems for atmospheric emissions in thermoelectric power plant, through the use of fuel with a very low sulfur content to reduce SO2 (in particular use of dense STZ oil at the Augusta plant).

Waters: water saving was achieved through: greater recovery of waste water which was possible thanks to keeping up maintenance standards of the plant for treating and recycling waters; the reuse of waste water as top-up water in cooling towers; the continuation at coal power plants of the programme to realize plants to crystallize waste water in the treatment of bleeding from desulfurization; arrangement of waste water treatment systems by osmosis.

Waste: work continued to remove materials containing asbestos where it has been found. For all the activities undertaken, the policy continued to look for new possibilities of recovering waste and packaging.

Soil: modernization at some plants of the containment basins for hazardous substances, elimination and recovery of tanks for dense oil.

Materials: recycling and use in the waste water treatment systems of mud in place of
feric chloride as the secondary neutralizer and of brine from the evaporators to correct the pH level (thermoelectric power plant of Priolo Gargallo). Gradual replacement of polluting and toxic products with other alternative, biodegradable and non-toxic products (hydrazine with carbohydrazide, biodegradable oil in place of mineral oil).

**Noise:** development of plants and new minimum vital water flows (MWW): Pontesei, Ghirlo, Santa Caterina, Soverzene tank, Comelico dam and Val Gallina dam (Hydro Veneto BU); Creva, Valnegra (Hydro Lombardy BU); Fiastra dam, MWW for Talvacchia dam, Scandarello dam and Sant’Eleuterio dam (Hydro Centre BU); MWW for Isola Santa, MWW for Grannolazzo dam, Villazolarendina (Hydro Emilia-Tuscany BU).

**Countryside:** environmental requalification of areas around plants.

## Global Generation

<table>
<thead>
<tr>
<th>Division</th>
<th>Segment</th>
<th>Description of intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Generation</td>
<td>Substances/Waste</td>
<td>Power plant of FusinaContinuing use of combustible waste/secondary solid fuel from urban waste.</td>
</tr>
<tr>
<td>Thermoelectric production</td>
<td>Renewables</td>
<td>Hydro Piedmont BUIn 2015 concession requests were presented for the following Hydro control units: Andrea 2 on the discharge of the demodulation basin of the same name in the municipality of Roccavione (Cuneo); Saretto at the base of the dam of the basin of the same name in the municipality of Acceglio (Cuneo); Comba Alta on the same line as the existing San Giacomo control unit in the municipality of Demonte (Cuneo); Pazzate on the discharge of the existing Crot control unit in the municipality of Usseglio (Turin). The authorization request was presented for partial renewal of the Geol plant in the municipality of Baceino (Verbano-Cusio-Ossola). Project for new units for energy recovery and the valorization on releases of the minimum vital water flow (MWW), as indicated above. Where possible sending of waste to recovery rather than disposal. Where possible replacement of oils with biodegradable alternatives.</td>
</tr>
<tr>
<td>Thermoelectric production</td>
<td>Emissions</td>
<td>Power plant of Priolo GargalloArchimedes project: use of renewable energy sources to reduce CO₂ and NOₓ. Operation of the demonstration thermodynamic solar plant for electricity production, of around 5 MW, on the site of Enel Produzione SpA in Priolo Gargallo (in the province of Syracuse).</td>
</tr>
<tr>
<td></td>
<td>Waters</td>
<td>Use of brine to correct the pH level in ITAR.</td>
</tr>
<tr>
<td></td>
<td>Reduction in consumption/improvement in efficiency</td>
<td>Power plants of Rossano and MercureOptimization in the use of auxiliary equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Work completed to realize the project to cover the coal storage area with a dome.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In 2015 the removal and clean-up of the cooling pipes containing asbestos was completed for the group 1 alternator at the Demonte plant; material containing asbestos inside the Entracque plant is still being extracted and the area cleaned up (at December 31, 2015) 3 of the 5 areas envisaged had been completed. Gradual replacement of the underground single-chamber tanks used to store gas oil to power plants or generators with new double-walled tanks and automatic detection of losses.</td>
</tr>
</tbody>
</table>
### Biodiversity

#### Main projects

**LIFE+ Con.Flü.Po**
Enel Green Power SpA is a co-founder of the LIFE+ project “Restoring connectivity in the Po river basin, opening migratory route for Acipenser Naccarii and 10 fish species included in Annex II” carried out in the nearby of Isola Serafini hydroelectric plant (Po River, North Italy). The aim of the project is to plan and build the largest fish ladder in Italy which will be able to restore the migration routes of fishes such as sturgeon, cobice, eel, shad and mullet from the Adriatic Sea to Lugano Lake. Measures for the control of invasive species will be also put in place as well as monitoring activities using different and advanced techniques.

**LIFE+ AquaLife**
Enel Produzione SpA is a co-founder of the LIFE+ project AquaLife: “Development of an innovation and user-friendly indicator system for biodiversity in groundwater dependent ecosystem” carried out in the National Park “Gran Sasso Monti della Laga” (Abruzzo, Central Italy) with the cooperation of University of L’Aquila and the Abruzzo Region. The aim of the AquaLife project is the development and dissemination of the AQUALIFE Package, which is an innovative and user-friendly indicator system to assess the biodiversity of groundwater dependent ecosystems (GDEs). GDEs are defined as those ecosystems whose biological structure and ecological processes are directly or indirectly influenced by groundwater. Enel Produzione SpA applied GDEs to properly define the Minimum Ecological flow for the hydroelectric plants located in the Vomano River watershed.

#### Division | Segment | Description of intervention
---|---|---
Global Generation | Substances | Hydro Veneto BU
Global Generation | Hydroelectric production | Replacements of polluting and toxic products with alternative biodegradable and non-toxic products.
Global Generation | Waste Hydroelectric production | Preference for sending waste materials for recovery.
Global Generation | Waste Hydroelectric production | Implementation of dedicated release devices for the MVW from minor works.
Global Generation | Waste Hydroelectric production | Hydro Sicily BU

During 2015, 4,680 kilos of asbestos were disposed of, insulating materials under GR 2 and 3 alternators and bridge crane brakes at the Anapo plant; asbestos at the Contrasto and Guadalami plants and braking devices at the Contrasto plant.

**EN12** | **EN13** | **EU13** | **EN** | **12** | **VU** | **14** | **RU** | **3**
Safeguarding corks and bats along the distribution grid
Enel Distribuzione SpA has been acting since a long time for the safeguard of raptors, corks and bats using the power lines as roosts or nests. Main activities include installation of platform for nesting, bat boxes, insulation of power lines as well as solutions to prevent accidental electrocution.

In 2015 the project “Follow the storks” has been carried out, a comprehensive plan to track with satellite’s applications the movement of the largest population of white storks in Italy (Gela, Sicily). In the Mincio natural park (Lombardy, North Italy) Enel Distribuzione cooperated with the National Center for White Storks reintroduction to provide power lines insulation and nesting supports for the storks.
Portugal

**Thermoelectric production**

**Total requirement:**
- 1,026,430 m³

**Total fresh water drawn off:**
- 1,026,430 m³
  - (100% from surface water)

**ATMOSPHERIC EMISSIONS**

| CO₂ (t) | 221,912,000 |

**Water for industrial use**

**Total requirement:**
- 1,026,430 m³

**Total fresh water drawn off:**
- 1,026,430 m³
  - (100% from surface water)

**Special waste**

<table>
<thead>
<tr>
<th>Produced</th>
<th>Transferred for recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-hazardous waste (t)</td>
<td>7.646</td>
</tr>
<tr>
<td>Hazardous waste (t)</td>
<td>0.137</td>
</tr>
</tbody>
</table>

**Type of plant**

<table>
<thead>
<tr>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>842</td>
</tr>
</tbody>
</table>

**Consumables**

- Sodium hypochlorite
  - 65.55%
- Lubricant
  - 11.25%
- Other
  - 23.20%

**Fuel consumption**

- Natural gas
  - 100%

**Net electricity production**

- Total: 605.27 millions of kWh

---

**The Numbers**

**Power plants**

- 1

**Net power**

- 842 MW

**Production**

- 605 millions of kWh

---

**Type of plant**

- With gas turbines in combined cycle
  - 1
  - 2
  - 842
Significant events in 2015

Enel operates in Portugal with Endesa in thermoelectric production and with Enel Green Power in wind energy production.

In 2015 the only thermoelectric plant in the scope of consolidation of the Group was the combined cycle plant (CCGT) of Pego owned by Endesa. The only fuel used is natural gas.

**G4-EN19**
In 2015 the emissions of CO₂ avoided totaled around 388 thousand tons thanks to the production of wind energy.

**G4-EN23**
Special waste compared to 2014 rose by around 17%, in particular the percentage of waste transferred for recovery in 2015 rose by around 8%.

**G4-EN27**
Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of such impacts.

**Waste:** valorization of almost all the waste produced. Classified as sub-products from volatile ash and gypsum.
<table>
<thead>
<tr>
<th>Production from renewables</th>
<th>Electricity distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Solar and wind production</td>
<td></td>
</tr>
</tbody>
</table>

- Enel Green Power SpA
- Enel Electrica Banat SA
- Enel Electrica Dobrogea SA
- Enel Electrica Muntelia Sud SA

**ROMANIA**
**Power Plants**

- **NET POWER**: 534 MW
- **PRODUCTION**: 1,330 Millions of kWh

**Type of Plant**

- **Wind**: 9
  - Net maximum capacity: 498 MW
- **Photovoltaic**: 4
  - Net maximum capacity: 36 MW

**Total**

- **Net maximum capacity**: 534 MW
- **Consumables**
  - **TOTAL**: 9.75 t
  - **Lubricant**: 6.68%
  - **Other**: 3.31%
  - **Dielectric oil**: 12.82%
  - **Other**: 6.68%
- **Net electricity production**
  - **TOTAL**: 1,330 millions of kWh
  - **Wind**: 96.69%
  - **Solar (photovoltaic)**: 3.31%

**Emissions of CO₂ avoided (t)**

- **TOTAL**: 1,503,774
  - From wind: 1,454,024
  - From solar: 49,749

**For production**

- **Non-hazardous waste (t)**
  - **TOTAL**: 11.13
- **Hazardous waste (t)**
  - **TOTAL**: 6.97

**Produced**

- **TOTAL PRODUCED**: 18.10 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 18.10 t

**Equivalent hours of use**

- **TOTAL**: 3,817
  - **Wind**: 2,581
  - **Photovoltaic**: 1,236

*Annual production/power ratio.

**Special waste**

- **TOTAL PRODUCED**: 18.10 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 18.10 t

- **Non-hazardous waste (t)**
  - **TOTAL**: 11.13
- **Hazardous waste (t)**
  - **TOTAL**: 6.97

**From**

- **Wind**: 1,454,024
- **Solar**: 49,749

**Power plants**

- **Prahova I**
- **Prahova II**
- **Colibaș**
- **Podari**
- **Corugea**
- **Zephyr I**
- **Zephyr II**
- **Salbatica**
- **Gebelesis**
- **Agipiești**
- **Gebetă**
- **Ghinaș**
- **Moldave Nouă**
- **Ploiești**

**Net maximum capacity**

- **TOTAL**: 534 MW

**Type of power plant**

- **Non-hazardous waste (t)**
  - **TOTAL**: 11.13
- **Hazardous waste (t)**
  - **TOTAL**: 6.97

**Consumables**

- **TOTAL**: 9.75 t
  - **Lubricant**: 6.68%
  - **Other**: 3.31%
  - **Dielectric oil**: 12.82%
  - **Other**: 6.68%

**Net electricity production**

- **TOTAL**: 1,330 millions of kWh
  - **Wind**: 96.69%
  - **Solar (photovoltaic)**: 3.31%
**General data**

- **Municipalities served**: 2,854
- **Surface area served (km²)**: 62,492
- **Customers connected to company network**: 2,714,436
- **Electricity (millions of kWh) distributed in total**: 14,582
- **Own consumption to operate network**: 18.4%
- **Total greenhouse gas**: 677.79 t equiv. of CO₂

**Electricity distribution**

- **Total lines (km)**: 91,285
- **Power (MVA)**: 21,364
- **Cabins**: 22,482

**Consumption of resources**

- **Total produced**: 6,412 t
- **Total transferred for recovery**: 2,352 t
- **Non-hazardous waste (t)**: 2,641
- **Hazardous waste (t)**: 5,772
- **Special waste**: 506
- **GAS OIL (toe)**: 38.6
- **CO₂ (t)**: 121.79

**Special waste**

- **Lubricant (t)**: 1.0
- **Dielectric oil (t)**: 57.5
- **Other (t)**: 1.5
- **Non-hazardous waste (t)**: 1,416
- **Hazardous waste (t)**: 506

**Dati generali**

- **Consumption of resources**
  - **Non-hazardous waste (t)**: 2,641
  - **Hazardous waste (t)**: 5,772
  - **Special waste**: 506
  - **GAS OIL (toe)**: 38.6
  - **CO₂ (t)**: 121.79

**Power lines**

- **Total lines (km)**: 91,285
- **Overhead lines with bare conductors (km)**: 6,301
- **Overhead lines (km)**: 22,054
- **Underground lines (km)**: 14,605
- **Total lines**: 42,960

**The Numbers**

- **Cabins**: 22,482
- **Power (MVA)**: 21,364
- **Total lines (km)**: 91,285
Significant events in 2015

Enel operates in Romania in wind and solar photovoltaic production with Enel Green Power, in electricity distribution (with Enel Distributie Banat, Enel Distributie Dobrogea and Enel Distributie Muntenia) and in electricity sales with Enel Energia and Enel Energia Muntenia.

G4-EN7
Energy saved thanks to reducing consumption and improving efficiency.

Modernization and replacement of low and medium voltage lines, with better insulation of the atmospheric impact as part of a broader project to optimize the operation network.

G4-EN19
Initiatives to supply energy efficient products and services or which are based on renewable energy, and reduction in the energy requirement thanks to these initiatives.

In 2015 Enel Romania replaced 5,500 incandescent light bulbs in Prundu with low consumption bulbs (15 W and 20 W), as part of a campaign to promote responsible electricity consumption.

G4-EN23
The emissions of CO₂ avoided thanks to wind production and production from solar photovoltaic plants totaled around 1.5 million tons.

G4-EN24
Special waste transferred for recovery totaled 2,370 tons, slightly down compared to 2014.

G4-EN24
Total and volume of significant spills. During 2015 there were 8 accidents in MV/LV secondary substations and 4 accidents in HV/MV substations with a total spill of 0.38 m³. The soil was treated and cleaned up with biodegradable and absorbent material.

G4-EN27
Initiatives to reduce the environmental impacts of products and services and the extent of mitigation of these impacts.

Noise: in order to prevent exposing workers and the local population to noise risk and electromagnetic fields, Enel’s worksites are constantly monitored. In 2015, 85 noise tests were carried out, focused mainly in sensitive areas such as power stations near residential areas, and on the basis of private notifications received by Enel Distributie Muntenia and Enel Distributie Banat. The results of measuring magnetic fields have always been below the legal limits. As for noise, counter-measures have been taken which have led in some cases to the reduction of the values below the limits allowed by the law.

Waste: the partnership continued between Enel Distributie Banat, Enel Distributie Dobrogea, Enel Distributie Muntenia and Recolamp Association for the recovery of non-functioning lighting. In addition, in partnership with Recolamp, it was possible to extend the collection of batteries. In 2015, 481 kg of lamps and fluorescent tubes were collected as well as 12 kg of small batteries.
RUSSIA

Thermoelectric production

THE NUMBERS

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
<th>Thermal power 10⁶ kcal/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam (condensing) with intermediate draw-offs of fluid for cogeneration</td>
<td>4</td>
<td>35</td>
<td>8,074</td>
<td>0</td>
</tr>
<tr>
<td>Back-pressure steam for cogeneration</td>
<td>0</td>
<td>3</td>
<td>61</td>
<td>0</td>
</tr>
<tr>
<td>With gas turbines in combined cycle for cogeneration</td>
<td>0</td>
<td>2</td>
<td>809</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>40</td>
<td>8,944</td>
<td>2,383</td>
</tr>
</tbody>
</table>

Net maximum capacity
TOTAL: 8,944 MW

Fuel consumption
TOTAL: 10,490,026 t (of oil equiv.)

Consumables
TOTAL: 8,338 t

Water for industrial use
TOTAL REQUIREMENT: 25,378,289 m³
TOTAL FRESH WATER DRAWN OFF: 25,804,608 m³

ATMOSPHERIC EMISSIONS

- NOₓ (t) | 86,105
- SO₂ (t) | 141,404
- Particulate matter (t) | 70,876
- CO₂ (t) | 31,348,826

Heat production (combined with the production of electricity)
TOTAL: 5,623,146 million kcal
EQUIVALENT TO: 6,539 million kWh

Waste water
DISCHARGED (m³) | 24,250,618
USED INSIDE THE PLANTS (m³) | 173,661

Special waste
TOTAL PRODUCED | 4,553,735 t
TOTAL TRANSFERRED FOR RECOVERY | 262,435 t

NON-HAZARDOUS WASTE

- Non-hazardous waste (t) | 4,546,290
- Hazardous waste (t) | 262,322

PRODUCED | 7,445
TRANSFERRED FOR RECOVERY | 114
Significant events in 2015

Enel operates in Russia in thermoelectric production with OGK-5.

**G4-EN1 G4-EN9**
The fuel mix saw a slight rise in the share of coal which offset a proportional fall in gas. The overall production level stayed practically the same as in 2014 (-0.7%).

**G4-EN10**
There was a fall in water consumption for industrial use. Specific consumption (in reference to the entire production of electricity and heat) fell from 0.64 l/kWh in 2014 to 0.53 l/kWh (-17%). The fall in consumption was mainly due to the dry removal system for coal ash used as an alternative to the wet system.

**G4-EN15 G4-EN16**
Specific emissions of CO₂ (in reference to the entire production of electricity and heat) rose slightly in 2015 compared to 2014 from 625 to 645 g/kWh due to higher production from coal-fired units.

**G4-EN21**
Net specific thermoelectric emissions of NOₓ and SO₂ remained stable compared to the previous year. Specific emissions of particulates (in reference to the entire production of electricity and heat) fell by 28% compared to 2014 due to the installation of fabric filters.

**G4-EN24**
Spills:
In October 2015 there were two notifications of traces of oil in the canals and fishing basins of the fishery next to the discharge canals of the 300 MW units. Water samples were collected and the cooling systems were inspected to identify the problem. Absorbent materials were deployed and after use were collected and disposed of in compliance with environmental law.

**G4-EN27**
Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of such impacts.

**Emissions**
Refinskaya: replacement of fabric filters completed in units 4 and 7, with a significant reduction in emissions of particulates.

Waste water
Refinskaya: construction and testing of a pumping station for the filtering and treatment of waters. The assessment of its efficiency will take place in 2016.

Noise
Nevinnomysskaya: construction of a noise reduction system. The assessment of its efficiency will take place in 2016.
Sredneuralskaya: rebuilding of the gas supply system underway in order to reduce noise emissions.
### SLOVAKIA Thermoelectric production

#### THE NUMBERS

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
<th>Thermal power 10^4 kcal/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam (condensing) with intermediate draw-offs of fluid for cogeneration</td>
<td>2</td>
<td>7</td>
<td>600</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>7</td>
<td>600</td>
<td>25</td>
</tr>
</tbody>
</table>

**Fuel consumption**

- Oil: 1.63%
- Natural gas: 0.63%
- Coal: 0.14%
- Lignite: 17.22%

**Consumables**

- Total: 62.495 t

**Waste water**

- Discharged (m³): 4,509,000
- Used inside plant (m³): n.a.

**Water for industrial use**

- Total requirement: 9,884,573 m³
- Total fresh water drawn off: 9,884,573 m³

**Emissions of CO₂ avoided**

- For electricity production from biomass: 44,562 t
- Equivalent to: 257 million of kWh

**Electricity**

- Net production: 1,824 million of kWh (includes production from biomass – 39.66 GWh – at the Nováky plant)

**Heat production**

- Combined with the production of electricity: 221,649 million of kcal
- Equivalent to: 1,911 million of kWh

**Special waste**

- Total produced: 456,137 t
- Total transferred for recovery: 1,870 t

**Non-hazardous waste**

- Total produced: 456,068 t
- Total transferred for recovery: 69 t

**Hazardous waste**

- Total produced: 69 t
- Total transferred for recovery: 41 t

**ATMOSPHERIC EMISSIONS**

<table>
<thead>
<tr>
<th>Emission</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOₓ (t)</td>
<td></td>
<td>3,884</td>
</tr>
<tr>
<td>SO₂ (t)</td>
<td></td>
<td>47,265</td>
</tr>
<tr>
<td>Particulate matter (t)</td>
<td></td>
<td>533</td>
</tr>
<tr>
<td>CO₂ (t)</td>
<td>from desulfurization</td>
<td>2,533,534</td>
</tr>
<tr>
<td></td>
<td>from combustion</td>
<td>2,506,579</td>
</tr>
<tr>
<td>Total (t equiv. of CO₂)</td>
<td></td>
<td>2,533,534</td>
</tr>
</tbody>
</table>

**Power plants**

- Total: 2
- Sections: 7
- Net maximum capacity MW: 600
- Thermal power 10^4 kcal/h: 25

**Consumables used inside plant (m³)**

- Lime for desulfurization: 4,509,000 m³

**Water for power production**

- Total produced: 1,824 million of kWh

**Electricity production**

- Net production: 1,824 million of kWh
- Heat production: 221,649 million of kcal

**Waste water discharged**

- Oil: 0.014%
- Natural gas: 0.035%
- Lignite: 1.80%
- Biomass and waste: 96.33%

**Electricity production**

- Net production: 1,824 million of kWh (includes production from biomass – 39.66 GWh – at the Nováky plant)

**Heat production**

- Combined with the production of electricity: 221,649 million of kcal
- Equivalent to: 1,911 million of kWh
SLOVAKIA

Production from nuclear

**THE NUMBERS**

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
<th>Thermal power 10^6 kcal/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam (condensing)</td>
<td>2</td>
<td>4</td>
<td>1,814</td>
<td>464</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>4</td>
<td>1,814</td>
<td>464</td>
</tr>
</tbody>
</table>

**Consumables**

- **TOTAL**: 6,371 t
- **Lime**: 1.84%
- **Caustic soda**: 1.59%
- **Sulfuric acid and hydrochloric acid**: 1.61%
- **Other**: 89.46%
- **TOTAL REQUIREMENT**: 44,360,849 m³
- **TOTAL FRESH WATER DRAWN OFF**: 43,847,933 m³

**Water for industrial use**

- **TOTAL**: 44,360,849 m³
- **89.46%** from river
- **1.61%** from waste waters

**USED INSIDE PLANT (m³)**

- **712,916 m³**

**Electricity**

- **MILLION kcal**
- **HEAT PRODUCTION (combined with the production of electricity)**: 469,946
- **Equivalent to 547 millions of kWh**

**Radionuclides in the discharged waste waters (GBq)**

- **Tritium**: 22,009

**Radioactive waste**

- **Radioactive atmospheric emissions**
  - **Noble gases**: 7,021 MBq
  - **Aerosol α**: 1,065 kBq
  - **Aerosol β and γ**: 16,228 MBq
  - **Strontium 89 and 90**: 617,216 MBq

**Emissions of CO₂ avoided (t)**

- **Nucleo-thermoelectric production**: 15,621,680 t

**Radioactive waste**

- **Solids (t)**
  - **HIGH LEVEL**: 0.3289
  - **LOW AND MEDIUM LEVEL**: 32.94

- **Liquids (m³)**
  - **HIGH LEVEL**: 0
  - **LOW AND MEDIUM LEVEL**: 46.2

**Radionuclides in the discharged waste waters (GBq)**

- **Tritium**: 22,009

**THE NUMBERS**

- **POWER PLANTS**: 2
- **NET POWER**: 1,814 MW
- **PRODUCTION**: 14,081 millions of kWh
Significant events in 2015

Enel operates in Slovakia with Slovenské elektrárne in thermoelectric and nuclear production (both cogeneration) and renewable production (hydroelectric and photovoltaic).

Compared to 2014 overall production fell by 11%, mainly due to the reduction in production from renewable sources (-47%).

As for consumables, there was a general fall in consumption of 26% due to lower thermoelectric production at the Vojany and Nováky plants.

As for the lower consumption of oil, this was also due in part to its reuse. In some plants there is intensive treatment of oil. In the thermoelectric plant of Vojany, for example, used oil is cleaned mechanically and electrostatically. In the nuclear plant of Bohunice, on the other hand, used dielectric oil is filtered and degassed.

Specific water consumption in reference to thermoelectric cogeneration saw an increase in 2015 (+1% compared to 2014) due to greater water consumption at the Vojany plant.

Emissions in 2015 rose slightly compared to 2014 (+5%). SO2 emissions increased mainly due to the temporary shutdown of some units for maintenance in the Nováky plant with a corresponding greater contribution from less efficient units with higher emissions.

In 2015 emissions of CO2 were avoided for a total of around 18 million tons, down compared to the figures for 2014 owing to lower electricity production from renewable sources.

The lower production of ash from coal compared to 2014 was due to the lower consumption of coal and lignite in thermoelectric production, which also caused a lower production of gypsum.

The production of low and medium level radioactive liquid waste did not change significantly from 2014.

Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of these impacts.

Use of materials: in the desulfurization process paper industry waste was used so as to reduce the use of natural lime resources. In 2014 in ENO a significant part of the production of non-hazardous waste (ash, lime) was classified as a sub-product and was mainly reused in the construction sector.

Emissions and renewables: in 2015 the quantity of biomass used in co-combustion in the fluidized bed boilers of the Nováky and Vojany plants saved the atmospheric emission of around 45 tons of CO2.
Main projects

Energy for Nature
In 2014 Slovenské elektrárne was awarded the prestigious European Business Award for the Environment (EBAE) 2012 in the new category Business and Biodiversity for its outstanding achievements in halting biodiversity loss and supporting natural ecosystems. The project, ongoing since 2007, is aimed to preserve wildlife (chamois, Alpine marmot, European lynx, grey wolf, peregrine falcon, golden eagle and salmon trout) in the National Park of High Tatras, one of Slovakia’s most important wildlife areas.
SPAIN

Thermoelectric production

Fuel consumption
TOTAL: 5,127,584 t (of oil equiv.)

Consumables
TOTAL: 585,126 t

ATMOSPHERIC EMISSIONS

NOx (t)
SO2 (t)
Particulate matter (t)
CO2 (t)
from desulfurization
from combustion
SF6 (kg) (t equiv. of CO2)
Total (t equiv. of CO2)

Waste water
DISCHARGED (m3)
58,151,000

Water for industrial use
TOTAL REQUIREMENT: 50,051,992 m3
TOTAL FRESH WATER DRAWN OFF: 47,190,708 m3

Special waste
TOTAL PRODUCED (t)
2,716,331
TOTAL TRANSFERRED FOR RECOVERY (t)
16,580

Net electricity production
TOTAL: 39,524 million kWh
Non-hazardous waste
TOTAL PRODUCED 2,708,317 t
TOTAL TRANSFERRED FOR RECOVERY 12,531 t

Hazardous waste
TOTAL PRODUCED 8,014 t
TOTAL TRANSFERRED FOR RECOVERY 4,849 t

Storage and movement of coal
Endesa manages three port terminals at Ferrol, Carboneras and Los Barrios for the storage and movement of coal destined for the power plants of Puentes (Ferrol), Almeria (Carboneras) and the thermoelectric power plant of Los Barrios owned by E.ON. The transfer of coal to the power plants is normally done by lorry.

Distance Ferrol-Puentes: around 60 km
Distance Carboneras-Almeria: around 1 km
Distance Los Barrios-CT E.ON: around 3 km

Other data (consumption of natural gas and gas oil, consumables, water for industrial use, waste water, atmospheric and water emissions, waste) are included later in those for thermoelectric production.
**Spain**

**Production from renewables**

- **Net maximum capacity**: Total 6,393 MW
  - Wind: 25.20%
  - Hydroelectric: 0.21%
  - Photovoltaic: 74.59%

- **Net electricity production**: Total 11,060 million kWh
  - Wind: 7.15%
  - Hydroelectric: 58.41%
  - Photovoltaic: 32.50%

- **Consumables**: Total 148 t
  - Wind: 56.49%
  - Hydroelectric: 0.55%
  - Photovoltaic: 42.97%

**ATMOSPHERIC EMISSIONS**

- CO$_2$ (t): 14 t
- SF$_6$ (all the segments) (kg): 3 kg
  - (t equiv. of CO$_2$): 0.07 t
- Total (t equiv. of CO$_2$): 14.07 t

**Equivalent annual hours of use**

- Wind: 2,224
- Photovoltaic: 1,830
- Hydro: 1,671

- Total: 5,934

**Emissions of CO$_2$ avoided**

- Total: 7,940,211

- For production:
  - Hydroelectric: 5,162,669
  - Photovoltaic: 2,559,741
  - Solar (photovoltaic): 17,801

**Consumables**

- Total: 148 t

**Water for industrial use**

- Total requirement: 16,825,987 m$^3$
- Total fresh water drawn off: 16,817,200 m$^3$

**Radionuclides in the discharged waste waters**

- Tritium: 60,829 Bq

**Waste water**

- Discharged: 1,677,491 m$^3$
- Used inside plant: 99.882 m$^3$

Waste waters include rainwater which flows into treatment plants if it comes from areas where it might have been polluted.
### Producción nuclear en España

La planta nuclear de Cofrentes emite gases nobles y criótomos 131. Los principales gases emitidos incluyen:

- **Radioactive atmospheric emissions**
  - Noble gases: 4,67 MBq
  - Iodine 131: 3,38 MBq
  - Strontium 90 and 90: 309,94 MBq
  - Aerosols: 18,50 MBq

#### The Numbers

- **CABINS**: 133,544
- **POWER (MVA)**: 145,255
- **TOTAL LINES (KM)**: 317,675

#### Type of Plant

- **Other secondary**: 235
  - Installed transformation capacity MVA: 2,276
- **Primary**: 1,002
  - Installed transformation capacity MVA: 83,579
- **MV/LV secondary**: 132,307
  - Installed transformation capacity MVA: 59,400

#### Total

- **133,544**
- **145,255**
- **317,675**

#### Power lines

- **Total lines**
  - HV: 19,479
  - MV: 118,436
  - LV: 179,760

#### Solids (t) and Liquids (m³)

- **Solids (t)**
  - HIGH LEVEL: 58,5
  - LOW AND MEDIUM LEVEL: 276
  - TOTAL PRODUCED: 3,335 t
  - TOTAL TRANSFERRED FOR RECOVERY: 891 t
- **Total solids**: 58,5 + 276 = 86,1 t
- **Liquids (m³)**: 4,24

#### Special waste

- **TOTAL PRODUCED**: 2,856
- **TOTAL TRANSFERRED FOR RECOVERY**: 479

#### Hazardous and non-hazardous waste

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Production (t)</th>
<th>Transferred for Recovery (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous</td>
<td>479</td>
<td>93</td>
</tr>
<tr>
<td>Non-hazardous</td>
<td>2,856</td>
<td>479</td>
</tr>
</tbody>
</table>

#### Radioactive waste

- **Solids (t)**
  - HIGH LEVEL: 58,5
  - LOW AND MEDIUM LEVEL: 276
- **Liquids (m³)**: 4,24

#### Production from nuclear

- **Radioactive atmospheric emissions**
  - Noble gases: 4,67 MBq
  - Iodine 131: 3,38 MBq
  - Strontium 90 and 90: 309,94 MBq
  - Aerosols: 18,50 MBq

#### Scope of the distribution network

- **Overhead lines with bare conductors**
- **Underground lines**
- **Overhead lines**
- **Total lines**
**Significant events in 2015**

In Spain Enel operates with Endesa in thermoelectric, nuclear and renewables production and in electricity distribution and sales and with Enel Green Power in production from renewables and thermoelectric combined with small systems.

Total production grew by around 3 TWh. The biggest factor was the increase of over 3.3 TWh in thermoelectric production from fossil fuels, the fall of around 1.6 TWh in renewables and the 1 TWh increase in nuclear production.

The use of non-fossil fuels in thermoelectric production saw:
- an increase in solid biomass from ~36,866 toe to 71,873.9 toe;
- a fall in biogas from landfills and the treatment of waste water from ~20,510 toe to 7,207 toe.

The consumption of fossil fuels in thermoelectric production rose compared to 2014, going from 8,329 ktoe to 9,054 ktoe.

The fossil fuel mix was characterized by the increase in the share of coal (+7%) together with natural gas (+30%) and an increase in oil (+4%), almost exclusively with a low sulfur content.

Owing to the increase in coal and lignite thermoelectric production, specific atmospheric emissions increased in relation to thermoelectric production for all the main macro pollutants.

In 2015 the emissions of CO\(_2\) avoided due to “carbon free” production totaled around 30 million tons, of which 22 million tons from nuclear production and around 9 million tons from renewable sources.

In 2015 there was a slight fall in the percentage of waste transferred for recovery, due in particular to the non-recovery of ash and gypsum from coal and lignite production following the fall in demand in the construction sector.

The specific production over the five years of low and medium level liquid radioactive waste depends on the maintenance and efficiency of the plants and, for high level solid waste, on the changeover of fuel rods.
Biodiversity

Main projects

Biodiversity in wetlands
Endesa has been implementing a census of water birds at the artificial lake in As Pontes, a restored open pit coal mine that once filled represents the largest lake in Spain. The aim is to evaluate and demonstrate the importance of the lake as a wetland.

Under the same topic, a project for the analysis and description of the status of wetlands in the Catalonian central depression investigates the evolution of these portions of land over the past 20 years with the purpose of drawing up management guidelines.

Ecosystem services and climate change
The sustainability of water resources under climate change is investigated through models for hydrological and sediment dynamics in the Noguera Pallaresa watershed (nearby of Rialb hydroelectric power plant) in response to climate change and land-use change. Moreover, a comparative study in the Ter and Noguera Pallaresa watersheds (Talarn power plant) is ongoing to determine the ecosystems status and quantify the related ecosystem services.

Avilinia Project
Co-ordination of Environmental Actions Deriving from the Power Transmission System and the Protection of Birds.

Under an agreement with the Balearic Islands Regional Government, Endesa Distribución has been implementing an environmental management plan to lower the risk of electrocution for birds in the most important areas in the Balearic Islands. Since the agreement was in force in 2004 an impressive total of 1,173 improvement initiatives have been carried out.
<table>
<thead>
<tr>
<th>Thermoelectric production</th>
<th>Production from renewables</th>
<th>Electricity distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endesa SA</td>
<td>Endesa SA</td>
<td>Endesa SA</td>
</tr>
</tbody>
</table>

- Hydroelectric production

**ARGENTINA**
**ARGENTINA**

**Thermoelectric production**

**ATMOSPHERIC EMISSIONS**

- NOx (t): 9,922
- SO2 (t): 3,229
- Particulate matter (t): 458
- CO2 from combustion (t): 5,923,923

**Water for industrial use**

- TOTAL CONSUMPTION: 2,529,890 m³
- TOTAL FRESH WATER DRAWN OFF: 2,529,890 m³

**Waste waters**

- DISCHARGED (m³): 1,528,097
- TOTAL PRODUCED (m³): 1,667,341
  - TOTAL TRANSFERRED FOR RECOVERY (m³): 726,312

**Fuel consumption**

- TOTAL: 2,283 t (of oil equiv.)

**Consumables**

- TOTAL: 7,819 t

**Special waste**

- TOTAL PRODUCED (t): 939.988
- TOTAL TRANSFERRED FOR RECOVERY (t): 0

**THE NUMBERS**

**Power plants**

- TOTAL: 5

**Net power**

- TOTAL: 3,056 MW

**Production**

- TOTAL: 11,966 millions of kWh

**Type of plant**

- **Steam**:
  - Power plants: 1
  - Sections: 10
  - Net maximum capacity MW: 735

- **Steam repowered with gas turbines**:
  - Power plants: 1
  - Sections: 1
  - Net maximum capacity MW: 328

- **Combined cycle**:
  - Power plants: 3
  - Sections: 5
  - Net maximum capacity MW: 1,521

- **With gas turbines in simple cycle**:
  - Power plants: 1
  - Sections: 2
  - Net maximum capacity MW: 72

**Net maximum capacity**

- TOTAL: 3,056 MW

**Fuel consumption**

- TOTAL: 2,283 t (of oil equiv.)

**Consumables**

- TOTAL: 7,819 t

**Special waste**

- TOTAL PRODUCED (t): 939.988
- TOTAL TRANSFERRED FOR RECOVERY (t): 0

**Water for industrial use**

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**Consumables**

- TOTAL: 7,819 t

**Special waste**

- TOTAL PRODUCED (t): 939.988
- TOTAL TRANSFERRED FOR RECOVERY (t): 0
ARGENTINA

Production from renewables

THE NUMBERS

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRO</td>
<td>2</td>
<td>2</td>
<td>1,328 MW</td>
</tr>
<tr>
<td>Run-of-the-river</td>
<td>1</td>
<td>1</td>
<td>1,200</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>1</td>
<td>1</td>
<td>128</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>2</td>
<td>1,328</td>
</tr>
</tbody>
</table>

Equivalent annual hours of use*  
TOTAL 2,439

Emissions of CO₂ avoided (t)  
TOTAL 1,579,624

For production:
- Hydro: 2,439
- Hydroelectric from natural sources: 1,579,624

*Annual production/power ratio (excluding hydro production from pumping sources).

Special waste

<table>
<thead>
<tr>
<th>Type of waste</th>
<th>Produced</th>
<th>Transferred for recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-hazardous</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Hazardous</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL PRODUCED 13 t  
TOTAL TRANSFERRED FOR RECOVERY 0 t
### THE NUMBERS

**Cabin: 18,600**

**Power (MVA): 18,627**

**Total Lines (KM): 26,010**

### Type of Plant

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Installed Transformation Capacity MVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>71</td>
<td>12,424</td>
</tr>
<tr>
<td>MV/LV secondary</td>
<td>18,526</td>
<td>6,159</td>
</tr>
<tr>
<td>Other secondary</td>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>18,600</td>
<td>18,627</td>
</tr>
</tbody>
</table>

### Power lines

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Total Lines (length in kilometers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV</td>
<td>3,792</td>
</tr>
<tr>
<td>MV</td>
<td>10,880</td>
</tr>
<tr>
<td>LV</td>
<td>11,338</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,010</strong></td>
</tr>
</tbody>
</table>

### Special waste

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Produced (t)</th>
<th>Transferred for Recovery (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-hazardous</td>
<td>276</td>
<td>0</td>
</tr>
<tr>
<td>Hazardous</td>
<td>204</td>
<td>0</td>
</tr>
</tbody>
</table>

### General data

- **Municipalities Served:** 13
- **Surface Area Served:** 3,303.51 km²
- **Customers Connected to Company Network:** 2,479,072
  - Own Consumption to Operate Network: 25
- **Total Greenhouse Gas:** 7,785 t equiv. of CO₂

### Electricity distribution

- **Distributed in Total:** 18,492
- **Own Consumption to Operate Network:** 25

### Atmospheric emissions

- **SF₆ (kg):** 280
- **Total Greenhouse Gas:** 7,785 t equiv. of CO₂

### Consumption of resources

- **Consumables (t):** 635
**Significant events in 2015**

Enel operates in Argentina with Endesa in thermoelectric and hydroelectric production and in the distribution and sale of electricity.

Electricity production rose in total by around 6% owing to greater production from renewables (+23%).

**G4-EN1**  **G4-EN3**
The fuel mix compared to 2014 remained stable. Production from renewables rose by around 19% compared to 2014, with a total increase in production in the country of 5%.

**G4-EN8**
There was a fall of around 12% in the net specific water requirement for industrial use in thermoelectric production.

**G4-EN21**
Net specific emissions of NO\(_x\) and SO\(_x\) fell respectively by 17% and 27%.

**G4-EN19**  **G4-EN16**
Net specific emissions of CO\(_2\) (referring only to thermoelectric production) fell by around 6.8 g/kWh (-1.4%).

**G4-EN18**
Emissions of CO\(_2\) avoided due to hydroelectric production totaled 1,579,624 t.

**G4-EN24**
Total and volume of significant spills.

In the Costanera plant there were 2 spills, one of oil (5 l) and one of fuel (10 l).

**G4-EN27**
Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of these impacts.

**Materials**
Edesur: in-house and external awareness raising campaign on energy saving.

**Water**
Costanera: management and control system for water consumption.

**Emissions**
Costanera: system to inject water into the combustion chamber to reduce NO\(_x\).

**Waste**
Edesur: training aimed at improving waste management.
Costanera: management and control system for hazardous waste.

**Noise**
Costanera: review and analysis of the purchase and installation of silencers on the steam turbo units, PLAN TVs.
ARGENTINA

Biodiversity

Main projects

El Morejón Reserve
The "Reserva Privada El Morejón" extends over a total area of 341 ha of which 38 are occupied by the Manuel Belgrano Plant and its facilities. Endesa took the opportunity to help to conserve nature by fostering the development of a preserved area. In this area there are two types of local forests (Tala and Sauzal), two lagoons due to the filling of water of local pits for the extraction of calcium carbonate and a variety of terrestrial plants, mammals and birds that inhabit and seek refuge in the lagoon islands, fishes, and amphibians.
**Consumables**

- **TOTAL:** 330 t

- 51.8% Sulfuric acid and hydrochloric acid
- 18.8% Sodium hypochlorite
- 15.0% Caustic soda
- 10.2% Natural gas
- 3.5% Polyethylene
- 0.4% Ammonia
- 0.1% Other
- 0.2% Ferrous sulfate

**Fuel consumption**

- **TOTAL:** 418,000 t (of oil equiv.)

**ATMOSPHERIC EMISSIONS**

- **NOx** (t) **529**
- **CO2** from combustion (t) **772,136**

**Water for industrial use**

- **TOTAL CONSUMPTION:** 71,147 m³
- **TOTAL FRESH WATER DRAWN OFF:** 71,147 m³

**Waste waters**

- **DISCHARGED (m³):** 446,867

Waste waters include rain water which flows into treatment plants if it comes from areas where it might have been polluted.

**THE NUMBERS**

- **POWER PLANTS:** 1
- **NET POWER:** 314 MW
- **PRODUCTION:** 2,342 billions of kWh

**TYPE OF PLANT**

- **With back-up gas turbines**
  - 1 Power plants, 1 Sections
  - Net maximum capacity MW 108

- **With gas turbines in combined cycle**
  - 1 Power plants, 2 Sections
  - Net maximum capacity MW 206

**Total**

- **1 Power plants, 3 Sections, 314 Net maximum capacity MW**
**Production from renewables**

**BRAZIL**

**Total nets electricity production**

TOTAL: 3,348 million kWh

- **Wind:** 2,038
- **Photovoltaic:** 584
- **Hydro from natural sources:** 3,340

**Emissions of CO₂ avoided (t)**

TOTAL: 1,937,904

- **Wind:** 472,794
- **Photovoltaic:** 4,125
- **Hydro from natural sources:** 1,460,985

**Equivalent annual hours of use**

TOTAL: 5,962

**THE NUMBERS**

**Power plants:** 38

**Net power:** 1,168 MW

**Production:** 3,348 millions of kWh

**TYPE OF PLANT**

<table>
<thead>
<tr>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-of-the-river</td>
<td>11</td>
<td>756</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>756</td>
</tr>
<tr>
<td>Wind</td>
<td>14</td>
<td>400</td>
</tr>
<tr>
<td>Photovoltaic</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>1,168</td>
</tr>
</tbody>
</table>
**BRAZIL**

**Electricity distribution**

**THE NUMBERS**

- **CABINS**: 252,932
- **POWER (MVA)**: 15,456
- **TOTAL LINES (KM)**: 196,594

**TYPE OF PLANT**

- **Cabins**
  - Primary: 226 (P), 7,559 MVA
  - MV/LV secondary: 252,706 (P), 7,897 MVA

**TOTAL**

- 252,932 (P), 15,456 MVA, 196,594 (P)

**Power lines (length in kilometers)**

- **Overhead lines**
  - With bare conductors: 8,870 (P)
  - Overhead lines: 119,141 (P), 19 (P), 81 (P)
- **Underground lines**: 63,988 (P), 4,459 (P), 25 (P)
- **Total lines**: 192,010 (P), 4,478 (P), 106 (P), 196,594 (P)

**Power lines**

- Overhead lines with bare conductors: 23.0% (P)
- Overhead lines: 97.6% (P)
- Underground lines: 0.1% (P)

**General data**

- **MUNICIPALITIES SERVED**: 181,501
- **SURFACE AREA SERVED (km²)**: 22,311
- **CUSTOMERS CONNECTED TO COMPANY NETWORK**: 6,634,294 (of whom supplied: 6,634,180)
- **TOTAL LINES (KM)**: 196,594

**Electricity (millions of kWh)**

- Distributed in total: 11,726 t
- Total transferred for recovery: 4,439 t

**Atmospheric emissions**

- **SF₆ (kg)**
  - In total: 83 (P)
- **TOTAL GREENHOUSE GAS**: 1,843 t equiv. of CO₂

**Consumption of resources**

- **CONSUMABLES (t)**
  - General data: 1,270 t (100% dielectric oil)

**Non-hazardous waste (t)**

- **PRODUCED**: 9,883 t
- **TRANSFERRED FOR RECOVERY**: 2,611 t
- **TOTAL PRODUCED**: 11,726 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 4,439 t

**Hazardous waste (t)**

- **PRODUCED**: 1,843 t
- **TRANSFERRED FOR RECOVERY**: 1,828 t
- **TOTAL PRODUCED**: 1,843 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 1,828 t
Significant events in 2015

Enel operates in Brazil with Endesa in thermoelectric and hydroelectric production and in electricity distribution and sales, and with Enel Green Power in hydroelectric, wind and solar production.

**G4-EN1**
The fuel mix compared to 2014 remained effectively stable, with a slight fall in thermoelectric production at the Fortaleza plant.

**G4-EN21**
Specific net thermoelectric emissions of NO\(_x\) remained stable compared to 2014.

**G4-EN15**
Net specific emissions of CO\(_2\) (referring only to thermoelectric production) fell by around 2% due to less intermittent operations throughout the year.

**G4-EN19**
Emissions of CO\(_2\) avoided due to production from renewables (hydroelectric, wind and solar) totaled 1,937,904 t.

**G4-EN24**
Total and volume of significant spills. Ampla: 3 spills for a total of 33 m\(^3\).

**G4-EN27**
Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of these impacts.

**Materials**
Ampla: in-house and external awareness raising campaign on energy saving.
### Thermoelectric Production

#### Type of Plant

<table>
<thead>
<tr>
<th>Power Plants</th>
<th>Sections</th>
<th>Net Maximum Capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam</td>
<td>3</td>
<td>459</td>
</tr>
<tr>
<td>With back-up gas turbines</td>
<td>2</td>
<td>276</td>
</tr>
<tr>
<td>Combined cycle</td>
<td>6</td>
<td>1,532</td>
</tr>
<tr>
<td>With gas turbines in simple cycle</td>
<td>9</td>
<td>485</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>2,752</td>
</tr>
</tbody>
</table>

#### Fuel Consumption

- Steam: 17.2% (12.7% oil equivalent)
- Gas oil: 31.1%
- Natural gas: 17.2%
- Coal: 5.1%
- Oil: 10.0%

#### Consumables

- Lime: 50.8%
- Ferric chloride: 5.1%
- Caustic soda: 3.1%
- Sulfuric acid and hydrochloric acid: 2.5%
- Sodium hypochlorite: 0.8%
- Lubricant: 0.4%
- Other: 0.8%

#### Water for Industrial Use

- Total Requirement: 1,978,941 m³
- Total Fresh Water Drawn Off: 1,159,749 m³

#### Waste Waters

- Discharged: 1,494,623 m³
- Waste waters include rain water which flows into treatment plants if it comes from areas where it might have been polluted.

#### Atmospheric Emissions

- CO₂ from combustion: 4,091,749 t
- NOₓ: 8,972 t
- SO₂: 4,706 t
- Particulate matter: 170 t

#### Special Waste

- Non-hazardous waste: 112,593 t
- Hazardous waste: 1,060 t

#### Special Waste

- Producers: 0 t
- Transferred for Recovery: 0 t
CHILE

Production from renewables

THE NUMBERS

POWER PLANTS

NET POWER 4,140 MW

PRODUCTION 13,508 millions of kWh

TYPE OF PLANT

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Sections</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-of-the-river</td>
<td>13</td>
<td>26</td>
<td>887</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>6</td>
<td>14</td>
<td>2,661</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>40</td>
<td>3,548</td>
</tr>
<tr>
<td>WIND</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind plant</td>
<td>9</td>
<td></td>
<td>418</td>
</tr>
<tr>
<td>PHOTOVOLTAIC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar plant</td>
<td>3</td>
<td></td>
<td>174</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>40</td>
<td>4,062</td>
</tr>
</tbody>
</table>

Net maximum capacity

TOTAL 4,062 MW

Net electricity production

TOTAL 13,508 million kWh

Emissions of CO2 avoided (t)

TOTAL: 9,695,298.3

For production:

- Hydroelectric from natural sources 8,806,446
- Hydroelectric from wind 701,225
- Solar (photovoltaic) 701,225

Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary:

- Wind 2,876
- Solar (photovoltaic) 1,501
- Photovoltaic 1,501
- Hydro 3,148

TOTAL: 7,935

Equivalent annual hours of use*

For production:

- Wind 2,876
- Solar (photovoltaic) 1,501
- Photovoltaic 1,501
- Hydro 3,148

*Annual production/power ratio.
Significant events in 2015

Enel operates in Chile with Endesa in thermoelectric, wind and hydroelectric production and in electricity distribution and sales, and with Enel Green Power in hydroelectric, wind and photovoltaic production.

Compared to 2014 thermoelectric production remained stable, and production from renewable increased with the coming into full operation of the new wind plant.

The fuel mix compared to 2014 changed as regards fossil fuels with an increase in gas oil, which went from 1.4% to 17.2%. Production from renewable increased by around 5.5% compared to 2014.

In relation to the fossil fuels used, there was an increase in emissions of NOx (+50%) compared to 2014. Emissions of SO2 and particulates fell respectively by 16% and 25% compared to the previous year.

Net specific emissions of CO2 (referring only to thermoelectric production) rose by 35% owing to the greater use of gas oil and coal during the year.

Emissions of CO2 avoided due to hydroelectric, wind and photovoltaic production totaled 9,695,298.3 t.

Total and volume of significant spills.

Chilectra: there were 19 leaks from transformers in various locations for an overall total of around 0.5 m³ of oil.

Endesa: oil spills totaling 2.8 m³.
Biodiversity

Main projects

Huinay (Chile)

Huinay in Chile, extends approximately 34,000 hectares from the Comau or Leptepu Fjord, in the province of Palena, up to Argentina and constitutes a privileged area in terms of biodiversity. This characteristic has made it a full-fledged research laboratory for a specific science foundation, Fundación San Ignacio del Huinay supported by Enel and its subsidiary Endesa. Active since 1998, the Foundation has contributed to the discovery of 50 new species including one, Endesa Tethocyathus, which is the first species to be named after a company.
**COLOMBIA**

**Thermoelectric production**

**ATMOSPHERIC EMISSIONS**

<table>
<thead>
<tr>
<th>Emission</th>
<th>Quantity (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO₂</td>
<td>3,908</td>
</tr>
<tr>
<td>SO₂</td>
<td>12,485</td>
</tr>
<tr>
<td>Particulate matter</td>
<td>629</td>
</tr>
<tr>
<td>CO₂ from combustion</td>
<td>1,418,338</td>
</tr>
</tbody>
</table>

**Special waste**

**Water for industrial use**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total produced</td>
<td>73,709</td>
</tr>
<tr>
<td>Total transferred for recovery</td>
<td>336</td>
</tr>
<tr>
<td>Total consumption:</td>
<td>280,307 m³</td>
</tr>
<tr>
<td>Total fresh water drawn off:</td>
<td>280,307 m³</td>
</tr>
</tbody>
</table>

**Consumables**

**Fuel consumption**

**Non-hazardous waste**

**Waste waters**

- **DISCHARGED (m³)**: 70,790
- Waste waters include rain water which flows into treatment plants if it comes from areas where it might have been polluted.

**COLOMBIA**

**Thermoelectric production**

**Power plants**

**Sections**

**Net maximum capacity MW**

**Type of plant**

- **Steam (condensing)**
  - Power plants: 2
  - Sections: 7
  - Net maximum capacity MW: 411

**TOTAL TRANSFERRED FOR RECOVERY (t)**

**TOTAL PRODUCED (t)**

**Special waste**

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal ash</td>
<td>66,707</td>
</tr>
<tr>
<td>Oil bottom ash</td>
<td>101</td>
</tr>
<tr>
<td>Other</td>
<td>1,050</td>
</tr>
</tbody>
</table>

**Water for industrial use**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity (t)</th>
</tr>
</thead>
<tbody>
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<tr>
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</tr>
<tr>
<td>Total fresh water drawn off:</td>
<td>280,307 m³</td>
</tr>
</tbody>
</table>

**Consumables**

**Fuel consumption**

**Non-hazardous waste**

**Waste waters**

- **DISCHARGED (m³)**: 70,790
- Waste waters include rain water which flows into treatment plants if it comes from areas where it might have been polluted.
**The Numbers**

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>POWER PLANTS</th>
<th>NET POWER</th>
<th>PRODUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11</td>
<td>2,996 MW</td>
<td>12,223 MW</td>
</tr>
<tr>
<td>HYDRO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-of-the-river</td>
<td>7</td>
<td>12</td>
<td>1,101</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>3</td>
<td>10</td>
<td>1,185</td>
</tr>
<tr>
<td>Pure/mixed pumping</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>22</td>
<td>2,996</td>
</tr>
</tbody>
</table>

**Emissions of CO₂ avoided (t)**

Total: 7,432,966

Hydro: 4,080

Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.

*Equivalent annual hours of use*:

Total: 4,080

*Annual production/power ratio.
Significant events in 2015

Enel operates in Colombia with Endesa in thermoelectric and hydroelectric production and in electricity distribution and sales.

Compared to 2014 thermoelectric production rose by 59% with contributions from both the Termozipa plant and that at Cartagena. Hydroelectric production fell overall by 3%.

In October 2015 Enel, through its Colombian subsidiary Emgesa, started production at the hydroelectric plant of El Quimbo, in Colombia. With installed power of 400 MW, the plant is located in the region of Huila, around 350 km south-west of Bogotá. The plant, which is fed by the Magdalena, the country’s biggest river, covers 6 municipalities (Gigante, Garzón, Altamira, El Agrado, Paicol and Tesalia).

G4-EN1 G4-EN3
The fuel mix compared to 2014 changed as regards fossil fuels with an increase in the consumption of oil, which went from 8.5% in the previous year to 26% in 2015, and fell in regard to the consumption of coal. Production from renewable rose by around 5.5% compared to 2014.

G4-EN8
There was a fall of around 12% in the net specific water requirement for industrial use in thermoelectric production.

G4-EN21
Compared to 2014 there was a fall in specific emissions of SO2 (-9%) and an increase in specific emissions of NO2 and particulates.

G4-EN18
Emissions of CO2 avoided due to hydroelectric production totaled around 7.4 million tons.

G4-EN15 G4-EN16
Net specific emissions of CO2 (referring only to thermoelectric production) fell by 22% in relation to the different fuel mix used.

G4-EN27
Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of these impacts.

Materials
It is required and checked that the supply sources for resources and materials are from sites authorized by the Environmental Authority.

Waters
Maintenance of an efficient use program in administrative offices through initiatives to promote reduced consumption.

Emissions
A project was undertaken to modernize street lighting with LED technology. For 2015, 10,507 traditional sodium lights were replaced with LED technology in order to achieve a reduction in energy consumption estimated at around 4,602 GJ.

A program of lending electric bicycles to employees was implemented, which enabled a saving of emissions of 25 tons of CO2 and 123,360 kilometers cycled.

A photovoltaic system installed on the roof of the offices at Codensa, the distribution company, with capacity of 42 kWp, meets 5% of energy demand. During 2015 it generated 25 MWh, avoiding the emission of 4.75 tons of CO2.

In addition, a program was maintained to monitor emissions of SF6 and control of vehicle emissions.

Waste
Codensa carries out controls over the whole process, from the generation to the disposal of all industrial and institutional waste. In the same way PCB contaminated material is removed for incineration or use.

Noise
Codensa responds opportunistically to customers’ requests regarding the noise generated by installations by applying specific corrective methods depending on the situation.
COSTA RICA

Production from renewables
> Hydroelectric and wind production

Enel Green Power SpA
### Costa Rica

#### Production from renewables

**The Numbers**

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Power Plants</th>
<th>Derivations</th>
<th>Net Maximum Capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydro</strong></td>
<td>3</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>1</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3</td>
<td>2</td>
<td>55</td>
</tr>
</tbody>
</table>

- **Net Electricity Production**
  - Total: 230 million kWh

- **Net Maximum Capacity**
  - Total: 55 MW

- **Consumables**
  - Total: 0.36 t

#### Emissions of CO₂ avoided (t)

- From wind: 54,955 t
- Hydroelectric from natural sources: 106,738 t

*Annual production/power ratio.

#### Special Waste

- **Total Produced**: 153,894 t
- **Total Transferred for Recovery**: 120,833 t

- **Non-Hazardous Waste (t)**: 120,232 t
- **Hazardous Waste (t)**: 0.601 t

### Costa Rica

#### Production from renewables

**Equivalent annual hours of use**

- Wind: 3,250
- Hydro: 4,893

*Annual production/power ratio.

#### Emissions of CO₂ avoided (t)

- For production:
  - From wind: 54,955 t
  - Hydroelectric from natural sources: 106,738 t

Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.
**COSTA RICA**

**Significant events in 2015**

Enel operates in Costa Rica with Enel Green Power in energy production from hydroelectric and wind.

Total production (hydroelectric and wind) rose by 7% due to a greater contribution from hydroelectric production.

In December 2015 the wind asset (24 MW net power) has been sold.

**Significant events**

Enel Green Power SpA

- Production from renewables
  - Hydroelectric production

Emissions of CO₂ avoided due to production from renewable totaled around 161 thousand tons.
## GUATEMALA

### Production from renewables

#### THE NUMBERS

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Derivations</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-of-the-river</td>
<td>1</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>4</td>
<td>4</td>
<td>150</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>5</td>
<td>164</td>
</tr>
</tbody>
</table>

- **Power plants**: 5
- **Net power**: 164 MW
- **Production**: 579 millions of kWh

---

### Consumables

- **Total**: 0.2 t
- **Equivalent annual hours of use**: TOTAL: 3,535
- **Hydro**: 3,535
- **Emissions of CO₂ avoided**: TOTAL: 339,133
  - **For production**: hydroelectric from natural sources
  - **Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.**

---

### Special waste

- **Total produced**: 1,707 t
- **Total transferred for recovery**: 0 t

---

### THE NUMBERS

- **Equivalent annual hours of use**: TOTAL: 3,535
- **Emissions of CO₂ avoided**: TOTAL: 339,133
  - **For production**: hydroelectric from natural sources
  - **Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.**

---

### Consumables

- **Total**: 0.2 t
- **Equivalent annual hours of use**: TOTAL: 3,535
- **Hydro**: 3,535
- **Emissions of CO₂ avoided**: TOTAL: 339,133
  - **For production**: hydroelectric from natural sources
  - **Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.**
**GUATEMALA**

**Significant events in 2015**

Enel operates in Guatemala with Enel Green Power producing hydroelectric energy. Total hydroelectric production fell by 20% compared to 2014.

**G4-EN19**

Emissions of CO₂ avoided due to production from renewables totaled around 339 thousand tons.

**G4-EN24**

Total and volume of significant spills.

There was a significant spill at the hydroelectric plant of Palo Viejo for a total of 0.8 m³.

**MEXICO**

**Production from renewables**

> Hydroelectric and wind production

Enel Green Power SpA
**Production from renewables**

**MEXICO**

**THE NUMBERS**

- **Power Plants**: 9
- **Net Power**: 499 MW
- **Production**: 1,372 TWh

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Power plants</th>
<th>Derivations</th>
<th>Net Maximum Capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydro</strong></td>
<td>3</td>
<td>3</td>
<td>53</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>5</td>
<td></td>
<td>446</td>
</tr>
<tr>
<td><strong>Photovoltaic</strong></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total**: 9 3 499

**Net Electricity Production**
- Total: 1,372 million kWh

**Net Maximum Capacity**
- Total: 499 MW

**Consumables**
- Total: 0.8 t

- Hydro from natural sources: 0.8 t (100%)
- Wind: 0 t

**Equivalent Annual Hours of Use**
- Total: 6,388

**Emissions of CO₂ Avoided (t)**
- Total: 796,493

- From hydroelectric from natural sources: 130,476
- From wind: 666,017

*Annual production/power ratio.

**Special Waste**
- Total Produced: 8.2 t
- Total Transferred for Recovery: 0 t

<table>
<thead>
<tr>
<th>Non-hazardous Waste (t)</th>
<th>Hazardous Waste (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>5.9</td>
</tr>
</tbody>
</table>

**Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.**

**Non-hazardous Waste (t)**
- 2.3

**Hazardous Waste (t)**
- 5.9

**Total Produced**: 8.2 t

**Total Transferred for Recovery**: 0 t
Significant events in 2015
Enel operates in Mexico with Enel Green Power, producing hydroelectric and wind energy.
Total hydroelectric production rose by 62% compared to 2014 due to the greater contribution from wind (+93% compared to the previous year owing to increased capacity of 83% due to the construction of the new wind farm).

Enel Green Power completed and linked to the grid the new Dominica II wind farm in Mexico, in the State of San Luis Potosi. The plant adds 100 MW to the Dominica I plant which is already operational, thus taking total installed capacity from the wind farm to 200 MW.
The farm, which is located in the municipality of Charcas, consists of 50 turbines of 2 MW each and can generate over 250 GWh per annum, equivalent to the annual requirement of around 143 thousand Mexican families, avoiding the atmospheric emission of around 140 thousand tons of CO₂ per annum. The two farms together will be able to produce over 510 GWh annually.

Emissions of CO₂ avoided due to production from renewables totaled around 796 thousand tons.
**Production from renewables**

**PANAMA**

**THE NUMBERS**

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>POWER PLANTS</th>
<th>NET POWER</th>
<th>PRODUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>2</td>
<td>312 MW</td>
<td>1,661 million kWh</td>
</tr>
<tr>
<td>Solar</td>
<td>1</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**Net electricity production**

<table>
<thead>
<tr>
<th>TYPE OF PLANT</th>
<th>Power plants</th>
<th>Derivations</th>
<th>Net maximum capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>1</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>Solar</td>
<td>1</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

**Total**

- 2 Power plants
- 1 Derivation
- 312 MW

**THE NUMBERS**

- **Net maximum capacity**: 312 MW
- **Net electricity production**: 1,661 million kWh

**Consumables**

- **TOTAL PRODUCED**: 8.4 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 0 t

**Emissions avoided**

- **TOTAL**: 1,447 t

**Type of avoided emissions**

- **Hydroelectric from natural sources**: 1,439 t
- **From solar**: 8 t

**Emitted annual hours of use**

- **TOTAL**: 6,245 t

**Special waste**

- **TOTAL PRODUCED**: 24.7 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 0 t

**Non-hazardous waste**

- **Produced**: 19.4 t
- **Transferred for recovery**: 0 t

**Hazardous waste**

- **Produced**: 5.3 t
- **Transferred for recovery**: 0 t

*Annual production/power ratio.*
Significant events in 2015

Enel operates in Panama with Enel Green Power in producing hydroelectric and solar energy.

Total energy production rose by around 48% compared to 2014 due to the greater contribution from hydroelectric (+47% in production compared to the previous year).

Enel Green Power completed and connected the Chiriquí plant to the grid. It is the first photovoltaic plant built by the Italian company in Panama.

With total installed capacity of 12 MW, the plant can generate over 19 GWh annually, equivalent to the annual consumption requirement of more than 16 thousand local families.

The energy generated by Chiriquí will be bought by the hydroelectric plant of Fortuna, which is also owned by Enel Green Power and is 90 km away.

The Chiriquí photovoltaic plant consists of 39,640 photovoltaic modules distributed over a surface area of 23,000 hectares.

G4-EN19

Emissions of CO₂ avoided due to production from renewables totaled around 1,447,000 tons.

Biodiversity

Fortuna forest reserve

The Fortuna forest reserve is a site of outstanding naturalistic value that extends for about 19,500 hectares near the Pacific coast of Panama. The area is part of the UNESCO “World Biosphere Reserve” network and is considered among the most important in the world for the wealth of its biodiversity. Enel Green Power in cooperation with the Smithsonian Tropical Institute was responsible for reforestation activities in areas particularly important for local communities.
### Thermoelectric Production

#### Net Power
- **MW**: 1,183

#### Production
- **Gigawatt-hours (GWh)**: 4,148

#### Type of Plant
- **Power plants**: 3
- **Sections**: 10
- **Net maximum capacity MW**
  - With gas turbines in combined cycle: 711 MW
  - With gas turbines in simple cycle: 472 MW
- **Total**: 1,183 MW

#### Water for industrial use
- **Total requirement**: 3,293,411 m³
- **Total fresh water drawn off**: 3,293,411 m³

#### Fuel consumption
- **Total**: 628,539 t (of oil equiv.)
- **Non-hazardous waste (t)**
  - Produced: 243
  - Transferred for recovery: 0
- **Hazardous waste (t)**
  - Produced: 339
  - Transferred for recovery: 0

#### Special waste
- **Total produced**: 602 t
- **Total transferred for recovery**: 0 t

#### Consumables
- **TOTAL**: 737 t
  - **Sulfuric acid and hydrochloric acid**: 13.5%
  - **Sodium hypochlorite**: 0.7%
  - **Other**: 94.9%

#### Atmospheric Emissions
- **CO₂ from combustion (t)**: 1,637,947

#### Waste waters
- **DISCHARGED (m³)**: 975,121

---

**Note:** Waste waters include rain water which flows into treatment plants if it comes from areas where it might have been polluted.
**Peru**

**Production from renewables**

**THE NUMBERS**

- **Power Plants:** 7
- **Net Power:** 755 MW
- **Production:** 4,653 TWhs of MWh

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Power Plants</th>
<th>Derivations</th>
<th>Net Maximum Capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-of-the-river</td>
<td>5</td>
<td>12</td>
<td>224</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>2</td>
<td>6</td>
<td>531</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7</td>
<td>18</td>
<td>755</td>
</tr>
</tbody>
</table>

**Consumables**

- **Total:** 1.2 t
  - Lubricant: 23.0%
  - Other: 77.0%

**Equivalent annual hours of use**

- **Total:** 5,942
  - Hydro: 5,942

**Emissions of CO₂ avoided (t)**

- **Total:** 2,820,939
  - Hydroelectric from natural sources: 2,820,939

**Special waste**

- **Total produced:** 490 t
- **Total transferred for recovery:** 0 t

<table>
<thead>
<tr>
<th>Type</th>
<th>Non-hazardous waste (t)</th>
<th>Hazardous waste (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-hazardous waste</td>
<td>476</td>
<td>14</td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Non-hazardous waste (t)**

- **Total produced:** 490 t
- **Total transferred for recovery:** 0 t

**Hazardous waste (t)**

- **Total produced:** 14 t
- **Total transferred for recovery:** 0 t
PERU
Electricity distribution

THE NUMBERS

**Cabins**
- 9,762

**Power (MVA)**
- 3,795

**Total lines (KM)**
- 27,324

**Type of Plant**

- **Primary**
  - 29
  - 1,991

- **MV/LV secondary**
  - 9,729
  - 1,774

- **Other secondary**
  - 4
  - 30

**Power lines**

- **HV**
  - 480
  - 92
  - 573

- **MV**
  - 2,113
  - 2,371
  - 4,484

- **LV**
  - 2,593
  - 10,692
  - 14,038

**Power lines**

- Overhead lines with bare conductors: 51.4%
- Overhead lines: 39.1%
- Underground lines: 9.6%
Significant events in 2015

Enel operates in Peru with Endesa in hydroelectric and thermoelectric production and in electricity distribution and sales.

Compared to 2014 thermoelectric production fell by 10%, while hydroelectric production rose by around 5%. Total annual production fell by around 3%.

G4-EN1
The fuel mix compared to 2014 remained unchanged since it consisted solely of natural gas and gas oil used only in the stages of powering up the plant.

G4-EN8
Specific net consumption of water for industrial use in thermoelectric production rose slightly, going from 0.73 to 0.82 l/kWh.

G4-EN21
Compared to 2014 there was a fall in specific emissions of SO₂ (-14%) and NOₓ (-1%) and an increase in specific emissions of particulates (+22%).

G4-EN15
Net specific emissions of CO₂ (referring only to thermoelectric production) fell from 400 to 388 g/kWh.

G4-EN19
Emissions of CO₂ avoided due to hydroelectric production totaled around 2.8 million tons.

G4-EN27
Initiatives to reduce the environmental impacts of products and services and the extent of the mitigation of these impacts.

Water
In 2015, the national water authority approved the reuse of industrial water for irrigation from the plants of Ventanilla and Santa Rosa.
Significant events in 2015

In Uruguay Enel Green Power operates with a wind farm, Melowind, located in the area of Cerro Largo, around 320 km from the capital Montevideo. The 50 MW wind farm can generate up to 200 GWh of electricity annually, equivalent to the average consumption of 74 thousand homes, avoiding the atmospheric emission of over 62 thousand t of CO₂ per annum.

The electricity is sold to the State electricity company UTE, which manages the transmission, distribution and sale of electricity in Uruguay.

Emissions of CO₂ avoided (t)

<table>
<thead>
<tr>
<th>Source</th>
<th>TOTAL: 29,808</th>
</tr>
</thead>
<tbody>
<tr>
<td>From wind</td>
<td>29,808</td>
</tr>
</tbody>
</table>

Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.

Equivalent annual hours of use*

<table>
<thead>
<tr>
<th>Source</th>
<th>TOTAL: 982</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>982</td>
</tr>
</tbody>
</table>

*Annual production/power ratio.
Production from renewables
> Wind production

Enel Green Power SpA
**CANADA**

**Production from renewables**

---

**THE NUMBERS**

**POWER PLANTS**

- Total: 2
- Net power: 103 MW
- Productions: 305 TWh

**TYPE OF PLANT**

- Wind
  - Power plants: 2
  - Net maximum capacity MW: 103

**Consumables**

- Total: 0.23 t
  - Dielectric oil: 56.5%
  - Other: 43.5%

**Emissions of CO₂ avoided (t)**

- Total: 246,949
  - From wind: 246,949

**Equivalent annual hours of use**

- Total: 2,958

---

**Special waste**

- Total produced: 1.75 t
- Total transferred for recovery: 1.75 t

**Hazardous waste (t)**

- Produced: 0.5 t
- Transferred for recovery: 0.5 t

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**Significant events in 2015**

- Enel operates in Canada with Enel Green Power North America in wind production with a consolidated capacity of 103 MW.

- In 2015 the CO₂ emissions avoided due to “carbon free” production totaled around 247 thousand tons, all from wind production.

**Castle Rock Ridge**

- Municipality: Pincher Creek
- Region: Alberta
- Year of construction: 2012
- Type: wind
- Capacity: 76 MW
- No. of wind generators: 33

**Saint Lawrence**

- Municipality: Newfoundland
- Region: Ontario
- Year of construction: 2012
- Type: wind
- Capacity: 27 MW

---

Enel operates in Canada with Enel Green Power North America in wind production with a consolidated capacity of 103 MW. In 2015 the CO₂ emissions avoided due to “carbon free” production totaled around 247 thousand tons, all from wind production.
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- Municipality: Newfoundland
- Region: Ontario
- Year of construction: 2012
- Type: wind
- Capacity: 27 MW

In 2015 the CO₂ emissions avoided due to “carbon free” production totaled around 247 thousand tons, all from wind production.
**UNITED STATES**

**Production from renewables**

**THE NUMBERS**

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Power Plants</th>
<th>Derivations</th>
<th>Net Maximum Capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>98</td>
<td>62</td>
<td>2,403</td>
</tr>
<tr>
<td>Run-of-the-river</td>
<td>60</td>
<td>60</td>
<td>200</td>
</tr>
<tr>
<td>Basin/reservoir</td>
<td>2</td>
<td>2</td>
<td>116</td>
</tr>
<tr>
<td>Geo</td>
<td>5,543</td>
<td>3</td>
<td>72</td>
</tr>
<tr>
<td>Wind</td>
<td>1,987</td>
<td>30</td>
<td>1,987</td>
</tr>
<tr>
<td>Photovoltaic</td>
<td>29</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL: 7,063 millions kWh**

**Equivalent annual hours of use**

- Wind: 1,951 hours
- Photovoltaic: 32,102 hours

**Geothermal fluid**

- **TOTAL FLUID EXTRACTED**: 59,532,000 t
- **STEAM USED FOR PRODUCTION OF ELECTRICITY**: 59,532,000 t

**Emissions of CO₂ avoided (t)**

- From wind: 4,149,137 t
- From photovoltaic: 32,102 t
- From geothermoelectric: 5,543 t
- From natural sources: 610,292 t

**Atmospheric emissions (t)**

- CO₂ produced from combustion of gas oil in back-up generators: 1,026 t

**Special waste**

- **TOTAL PRODUCED**: 162,710 t
- **TOTAL TRANSFERRED FOR RECOVERY**: 690 t

<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>Non-hazardous Waste (t)</th>
<th>Hazardous Waste (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produced</td>
<td>330</td>
<td>162,380</td>
</tr>
<tr>
<td>Transferred for recovery</td>
<td>307</td>
<td>383</td>
</tr>
</tbody>
</table>
Significant events in 2015

Enel Green Power North America (EGP-NA), which is part of Enel Green Power, is a leading company which owns and manages renewable energy plants in North America with projects in operation and under development in 21 States of the USA. Total production from renewable sources increased compared to the previous year by around 689 GWh (+11%), basically due to the greater contribution from wind.

In 2015 CO₂ emissions avoided due to “carbon free” production totaled around 5 million tons (around 8% more than the previous year).

Main projects

**Safeguarding birds and bats in wind power plants**

Enel Green Power is working with the American Wind and Wildlife Institute (AWWI) to investigate the impacts of wind energy facilities while identifying science based solutions to prevent and minimize those impacts. These solutions include the use of audio or visual deterrents which have proven to be effective especially for bats. Bald and Golden Eagle protection is also a current key focus of AWWI, who is exploring lead shot abatement and road carrion removal programs as ways to prevent eagles mortality.

**By pass systems for migratory fishes in hydroelectric plants**

To enhance understanding of migration conditions and patterns, Enel Green Power cooperates with fishery agencies to monitor the movements and ecology of anadromous and catadromous species such as eels, salmons, alewives. Lits and ladders are built in the Lawrence and Bootts hydroelectric power plants (New England, Massachusetts) to ease the passage of local species of eels and salmons.
Production from renewables

> Wind production

Enel Green Power SpA
Significant events in 2015

In September 2015, Enel Green Power acquired BLP, an Indian company with 35 employees and 170 MW of installed capacity. BLP, one of the most important renewable energy companies in India, currently owns and manages wind farms in the States of Gujarat and Maharashtra.

**The Numbers**

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Power Plants</th>
<th>Net Maximum Capacity MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>3</td>
<td>172</td>
</tr>
</tbody>
</table>

**Total**

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>172</th>
</tr>
</thead>
</table>

**Emissions of CO₂ avoided (t)**

TOTAL: 48,391.5

For production:

from wind: 48,391.5

Emissions from thermoelectric production using fossil fuels which would otherwise have been necessary.
SOUTH AFRICA

Production from renewables

> Solar production

Enel Green Power SpA

SOUTH AFRICA
Significant events in 2015

In June 2015 Enel Green Power was awarded two 20-year contracts for energy supply with the South African utility Eskom for projects totaling a further 280 MW. The two wind projects, Soetwater (142 MW) and Garob (138 MW), which will be built in the Northern Cape province in areas with considerable wind potential, will be completed and come into operation by the end of 2018 and require total investment of around 340 million euro, in line with the strategic growth objectives envisaged by Enel Green Power’s current industrial plan.

Once they are completed the two plants will be able to generate around 1,000 GWh per annum, making an important and environmentally sustainable contribution to the country’s growing energy demand.

The Soetwater and Garob projects, which join the wind farm projects at Oyster Bay (142 MW), Nauba (141 MW) and Karusa (142 MW), will bring the capacity of the Enel Green Power Group to 705 MW.

The new projects will join the 10 MW from the Upington photovoltaic plant which Enel Green Power already operates in the country and the 513 MW of projects for which 20-year energy supply contracts have been signed with Eskom, following their award as part of the third stage of the REIPPPP’s tender of 2013. In particular, these are the photovoltaic plants of Aurora (82.5 MW), Tom Burke (66 MW), Paleisheuwel (82.5 MW), Pulida (82.5 MW) and the wind farms of Gibson Bay (111 MW) and Nojoli (88 MW).
### Biodiversity

**Legend**

- Fauna
  - mammals
  - birds
  - fish
  - flora

- Ecosystem
  - land
  - water
  - wet zones

- GRI Indicator
  - EN11
  - EN12
  - EN13
  - EN14
  - EN15
  - EU13

### IUCN Risk of Extinction

<table>
<thead>
<tr>
<th>CR</th>
<th>EN</th>
<th>VU</th>
<th>NT</th>
<th>LC</th>
<th>EW</th>
<th>EXTINCT</th>
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<tbody>
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<td></td>
<td>LOW RISK</td>
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</tbody>
</table>

The Red List, which is drawn up by the International Union for Conservation of Nature (IUCN), provides information on the conservation status of various species.
SEEDING ENERGIES
There is an energy that is produced every day, which, once generated, belongs to everyone.
This energy is fuelled by ideas, passion and cooperation.
They are small and powerful seeds, from which grow tangible fruits: innovation and progress, in tune with the world around us.
At Enel, that is how we define Sustainability.