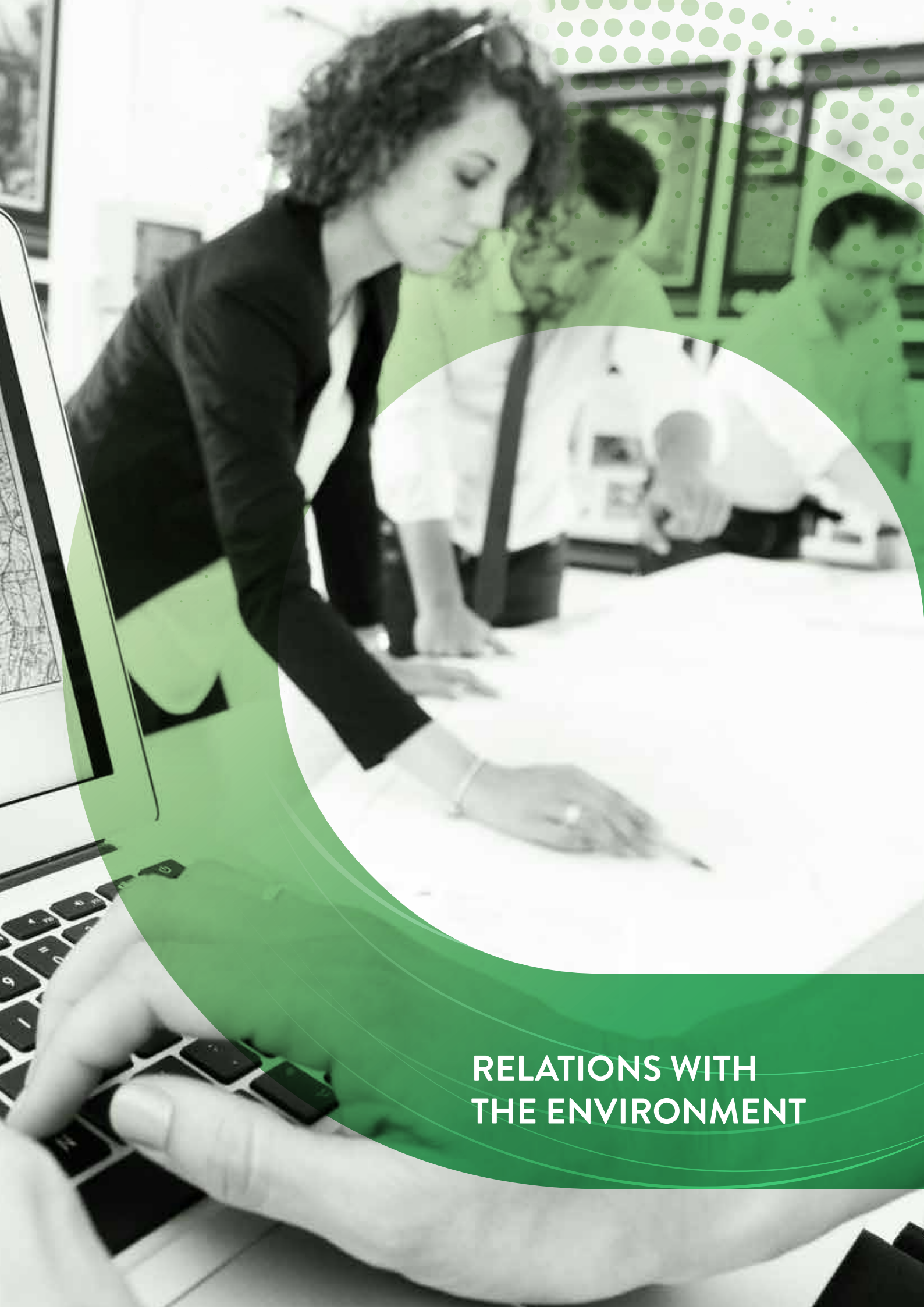


RELATIONS WITH THE ENVIRONMENT

ENVIRONMENTAL SUSTAINABILITY AND THE GREATEST CHALLENGES

The principal challenges for environmental sustainability, in the context in which Acea operates, are focused on three issues: **the climate, water resources and the circular economy**.
In so far as concerns the issue of climate change, Acea, for many years, has undertaken a course of **reducing its own climate-altering emissions**. With regard to water, the extraordinary drought which struck Italy in 2017, and in particular the summer, so scorching, have made evident the need to plan and carry out important interventions in relation to infrastructure. In relation to the circular economy Acea has already been investing for some years, pursuing the triple objective of: reducing the waste of the community, increasing the reuse of production waste and obtaining energy recovery.

The national context, with regard to the climate is the following: in February 2017, and following July, on the website of the Ministry of the Environment the **public consultation** was launched to develop the **National Plan for Adaptation to Climate Change**, that has not yet reached the final outcome, which will define the concrete planning of the national strategy of adaptation to climate change[91].

STRATEGY AND NATIONAL PLAN FOR ADAPTATION TO CLIMATE CHANGE

In Italy, the first step to confront the issue of climate change in a systematic manner was, in 2015, the definition and approval of the National Strategy for Adaptation to Climate Change (SNAC), which has identified the principal impacts of climate change on some socio-economic sectors and natural context and has proposed adaptation measures. In May 2016 the development of the **National Plan for Adaptation to Climate Change** (PNACC) was launched, to give impulse to the implementation of the SNAC. In February 2017, and in July the public consultation was launched on the website of the Ministry of the Environment. Indications were collected from the principal stakeholders regarding the perception of the impacts and the vulnerabilities in terms of adaptation and the principal actions were identified. The scheme of the Plan, edited by the Climate-Energy General Directorate of the Ministry of the Environment, is currently in the phase of being shared with the national institutions, the central government departments and the local communitys and the Plan identifies **six climatic macro-regions** and **eighteen sectors particularly vulnerable** to changes in the climate: according to the territorial area to which it belongs and the sector of reference, each user may define which actions, among those envisaged, shall be priorities, assigning a level of relevance to **nine criteria**: effectiveness, economic efficiency, existence of opportunities without elements of conflict with other public policy objectives, existence of "win-win" opportunities, robustness, flexibility, socio-institutional feasibility, multidimensionality and urgency.
The PNACC proposes to:

- identify the **priority actions in terms of adaptation** for the key sectors identified in the SNAC, specifying the timescales and the parties responsible for the implementation of the actions;
- provide indications to improve the use of possible **opportunities**;
- favour the **coordination** of actions at various levels.

Source: http://www.pdc.minambiente.it/news-ed-eventi/piano-nazionale-di-adattamento-ai-cambiamenti-climatici-consultazione-pubblica
piano-nazionale-di-adattamento-ai-cambiamenti-climatici-consultazione-pubblica

At international level, after the UN's twenty second conference on the climate, which was held at Marrakesh in 2016, in **November 2017 COP23** was held **at Bonn**, in order to discuss the technical aspects of application of the 2015 Paris Agreement. Resounding results were not achieved, but **procedures** were defined to arrive at the **revision of the commitments of States** (*National Determined Contributions*) **to cut the emissions** of greenhouse gases. The commitments made at Paris two years ago, indeed, have proven to be

[91] See http://www.minambiente.it/notizie/strategia-nazionale-di-adattamento-ai-cambiamenti-climatici-0.

insufficient to reach the objective of the said Agreement (keeping global working within 2 degrees - possibly within 1.5 degrees - of pre-industrial levels) and require to be updated. The revision shall be the objective of the next UN Conference on the climate, COP24 at Katowice, in Poland, in November 2018.
In this context, **Acea**, recognising the centrality of environmental protection and of the conflict with climate change, and in line with the Paris Agreement, **has included in its own strategy both adaptation measures to climate change and mitigation measures** (see the *Sustainability Plan 2018-2022 and the operational objectives* in the *Corporate Identity*).

MITIGATION AND ADAPTATION TO CLIMATE CHANGE

As mentioned, Acea confronts the challenges of climate change on two fronts. Firstly, the business has taken note of the disadvantages that the meteorological trend linked to climate change is determining in the Country and in the water and energy sectors in which it operates and, for example, it has become a member, together with 36 other organisations, of the **Alliance of Italian companies for water and climate change**, (see the dedicated box in *Corporate Identity* - paragraph *Strategy and Sustainability*), aimed at the commitment in: "innovative actions and instruments that we know to involve, at the end of the planning phase, various stakeholders (citizens, institutions, both public and private, associations, technicians and experts) in order to pursue the objective of making savings in use and in consumption and at the same time to reducing polluting cargoes". The Pact highlights the importance of collaboration with the institutions underlining how: "we, representatives of companies and associations, the majority of which have already for some time been committed to combating climate change and improving the management of water, support and share the commitments assumed by the Italian Government and by the international institutions at the conclusion of the COP 21 at Paris in November 2015, aimed at containing and adapting to the effects of climate change". On this topic see also the *Sustainability Plan 2018-2022*, which defines precise objectives for the Companies of the Group up until 2022.
Secondly, Acea continues to **implement a policy of containing greenhouse gas emissions** and, in particular, emissions of carbon dioxide (CO_2) and gives evidence of its commitment **by participating in the international CDP project (formerly Carbon Disclosure Project)**, considering it to be, right from its beginnings, an important stimulus, at international level, on the issue of actions to reduce/mitigate emissions.

ACEA CONFIRMS THE POSITION IN THE LEADER CLASS OF CDP

Again in 2017, confirming the excellent performance of the previous year, Acea was awarded the **score A-**. In this manner, notwithstanding the assignment of ever more challenging objectives to participating companies, Acea has guaranteed its **permanent position in the leadership class**, according to the scoring methodology of CDP, as recognition of the commitment brought into being in order to combat climate change.
The initiative, which for more than ten years has been supported by a pool of international investors, currently more than 800, with assets under management equalling 100 thousand billion dollars, analyses about 2,000 companies in the world on performance linked to measures to combat climate change, endorsing the best in class in the strategic and operational management of risks and impacts inherent in the "climate" issue.
The Utilities division is confirmed as the industrial sector with the best CDP evaluations. More information can be found on the website: https://www.cdp.net.

For a number of years Acea has initiated **an investigation regarding emissions along its own supply chain**, with the objective of making suppliers aware of the issue. In 2017 **it has, therefore, afresh distributed an ad hoc questionnaire to a panel of suppliers**[92] of "goods and services" and of "works", requesting quantitative information: fuels consumed for ordinary uses and processes, energy consumed, fuels consumed for transport (see the paragraphs *Energy Consumed Outside the Group* and *Emission of Greenhouse Gases*).
Furthermore, the suppliers who intend to enrol in the Qualification Systems active in Acea are bound, as a mandatory requirement, to fill out self-evaluation questionnaires which include questions of an environmental and social type (see also the chapter *Suppliers* for the details).

Over the time frame of the last ten years, after having undertaken initiatives such as increasing the **production from renewable energy sources**, increasing the **efficiency in internal end use of energy** and **modernising the service vehicle fleet, Acea has achieved values of carbon intensity** (tCO_2/k€ of added value; gCO_2/kWh products, etc.) **among the lowest in Italy in the Utilities industry** (see the box *Acea confirms the position among CDP's Leader Class* and table no. 60 regarding the energy intensity indexes).

PROTECTION OF THE LAND

Among the principal activities of safeguarding of the land and of biodiversity in the locations in which the Group operates, there are recalled, by way of example, the **protection of the areas around the water sources and the modernisation of the electricity distribution networks**, described later. Furthermore, the Group contemplate the protection of biodiversity in the procedures of the **Environmental Management Systems**, in the context of the planning and construction of installations, as well as during the very management of the relevant areas. This applies, for example, for the planning, construction and maintenance of overhead installations in High Voltage/Medium Voltag and Low Voltage, under Areti's responsibility, and for the protection of the basins of Acea Produzione's hydroelectric power stations, which improve the living conditions of the "migratory" and "non-migratory" bird life: the aforesaid bird life, indeed, recognises these sites as points of reference for the breeding/feeding and during the phases of migration.

SOURCES AND PROTECTED AREAS

For water supplies the Group predominantly uses **sources situated in uncontaminated zones**. Rome, for example, is currently one of the few metropoles around the world which can boast of a **water**

[92] The suppliers to whom the form was sent requesting data concerning the consumption of electricity and CO_2 emissions (in order to quantify the Group's Scope 3 type emissions) were identified, as was already done for 2016, among the most relevant in terms of turnover.

resource that for the most part does not require **preliminary purifying treatment to make it drinkable**, since it is of **excellent quality** from its origin.

The supply system for the whole province of **Rome** is based principally on **eighteen large water pipelines** which transport the water derived from **92 sources** and 120 well fields, for a total development of **more than 720 km of network**[93], to which are added a further **1,176 km of conveyance network** and **9,442 km of distribution network** of drinking water, for a flow that reaches 20,000 litres/second. To supplement this asset of inestimable value the reserve constituted by the lake of Bracciano is available, used in the event of necessity, following it being transformed into drinking water with a process of sedimentation/filtration and final disinfection.

The drinking water system of the land of Ato 5 Southern Lazio – **Frosinone** is constituted by installations and networks, of conveyance and distribution, which are in charge of **7 principal sources** from which **likewise water pipeline systems** have their origin, for a total of 4,330 km; finally, the drinking water system of the province of **Benevento** also boasts a plurality of sources from which originates the water network of about 119 km of pipelines and conveyance and about 1,270 km of network of distribution.

Each year Acea places maximum attention on the **protection** and **safeguarding of water resources**, also in observance of the provisions of Legislative Decree no. 152/2006, which at art. 94 governs the arrangement for **protection of areas in which water destined for human consumption is present above and below the surface of the ground**. In tables nos. 44, 45 and 46 are described the location and surface areas in square metres of the **areas subject to absolute protection**[94] respectively in the province of Rome, in the province of Frosinone and in that of Benevento.

TABLE NO. 44 - THE PRINCIPAL SOURCES UNDER PROTECTION IN ATO 2 – CENTRAL LAZIO

sensitive area	location	surface area (m^2)
Peschiera sources	municipality of Cittaducale (Rieti, Lazio)	375,322
Le Capore sources	municipality of Frasso and Casaprota (Rieti, Lazio)	997,848
Acqua Marcia source	municipalities of Agosta-Arsoli-Marano Equo (Rome)	1,181,979
Acquoria source	municipality of Tivoli (Rome)	17,724
Acqua Felice - Pantano source	municipality of Zagarolo (Rome)	779,143
Pertuso sources	municipality of Trevi – Filettino (Lazio)	133,711
Doganella sources	municipality of Rocca Priora (Rome)	350,000
Acqua Vergine sources	municipality of Rome	500,000
Torre Angela wells	municipality of Rome	70,829
Finocchio wells	municipality of Rome	64,166
Lake of Bracciano	municipality of Rome	169,200

TABLE NO. 45 - THE PRINCIPAL SOURCES UNDER PROTECTION IN ATO 5 – SOUTHERN LAZIO

sensitive area	location	surface area (m^2) (*)
Posta Fibreno wells	municipality of Posta Fibreno (Frosinone)	20,000
Tufano wells	municipality of Anagni (Frosinone)	18,000
Capofiume source	municipality of Collepardo (Frosinone)	10,000
Madonna di Canneto source	municipality of Settefrati (Frosinone)	10,000
Forma d'Aquino wells	municipality of Castrocielo (Frosinone)	20,000
Carpello wells	municipality of Campoli Appennino (Frosinone)	15,000
Mola dei Frati wells	municipality of Frosinone	5,000

(*) The surface area data is estimated.

TABLE NO. 46 - THE PRINCIPAL SOURCES UNDER PROTECTION IN THE PROVINCE OF BENEVENTO – ATO - CALORE IRPINO

sensitive area	location	surface area (m^2)
12 wells	municipalities of Benevento, Telese Terme, Castelpagano, Vitulano, Melizzano, Sant'Agata de' Goti, Cautano and Forchia	9,110
Ciesco source	Castelpoto	307

[93] During 2017 kilometres of water pipes were digitised, thus updating the estimates of past years.

[94] The areas of absolute protection are the areas immediately surrounding the catchments or off-springs, as defined in Legislative Decree no. 152/2006.

sensitive area	location	surface area (m^2)
Faitillo and Orto dei Ciuffi source	San Giorgio La Molara	2,412
Gradola source	Tocco Caudio	707
Monticelli source	Castelpagano	358
Pietrafitta and Ruggiero source	Torrecuso	2,242
San Vito source	Frasso Telesino	249
Voneventa source	Molinara	516

The activities performed to safeguard the areas around the sources contribute furthermore to the protection of the ecosystemic services concerned and biodiversity as a whole. The **monitoring of the land** has been performed, for some time, also with the assistance of a **"satellite project"**. In order to make the surveillance action more efficient, this has been concentrated in the places in which there has been noted – on the basis of the comparison between two images taken from space at a distance of several months – an unjustified or in any event suspect morphological variation, such as new, unsurveyed constructions, earth movements, small landfills. The staff of Acea Ato 2 have been invited to the site in order to ascertain the existence of real threats to the water resource, allowing a **precise and effective defence action**. In the second year of application of the new satellite control model, the **area monitored was about 200 km²** and **31 "suspect variations"** were observed, which have likewise lead to targeted inspections. This has allowed an abusive landfill to be identified in a stratum protection zone.

The protection of the natural environment by Acea takes place, as already mentioned, also **during the phase of distribution of electricity**. The company Areti, which manages this activity, attends to the **mitigation of the risk of impact to the bird life on account of the presence of high and medium voltage overhead cables**. For this purpose, the Company, in collaboration with the competent Authorities, places in the field the best technological response to the problems which can be determined in sensitive areas or areas of particular natural value (see the *Memorandum of Understanding for the Rearrangement of the Electricity Networks* in the paragraph *Energy Distribution*).

ENVIRONMENTAL MANAGEMENT

The **Management Systems** integrated and certified according to the UNI EN ISO standards are implemented, or in the process of implementation in the majority by the company (see the dedicated paragraph in *Corporate Identity*).
The Holding Company has an **Integrated Management System for Quality, Environment, Safety/Security and Energy**, as a foundation of an organisational and management model which, in synergy with the Environmental Legislation Unit of the Parent Company's Corporate and Legal Affairs Function, has the tasks of guaranteeing the environmental *compliance* and providing general guidelines for the companies of the Group, in order that their approach to the protection of the environment shall be conform to the principles expressed in the *Code of Ethics*.
The planning process, envisaged by the ISO Systems ISO 9001, 14001 and 50001, fixes, at each cycle, new **efficiency objectives** in environmental and energy management. The **control of performance indicators**, including that envisaged by the Systems and put into effect, allows the correctness of the direction undertaken to be evaluated or signals of anomalies to be identified prematurely, which can be corrected timeously, in application of the **principle of continuous improvement**, point of management strength, which leads to the reduction of costs and risks.

Each year the commitment of the operational companies to keep the system of management of environmental issues efficient is very high; notwithstanding these situation can occur, usually provoked by contingent circumstances, which generate non-conformity liable to be questioned by the **Competent Control Bodies**.
During the course of 2017 there were recorded, **in the consolidated area**, **about 300 environmental disputes**. Included in this number are both those that arose during the year, which however cannot be connected to the fines paid and those which have instead given rise to the fines paid in 2017 (about 150), **for an amount of about €326,000**.
Still with reference to the year under examination there are to be reported **two cases of criminal significance in environmental matters** which have concerned the companies Acea Ato 2 and Acea Ambiente.
Relative to the first, which sees the joint involvement of Acea Ato 2 and of its directors for the presumed hypotheses of the crime of negligent environmental pollution of the Lake of Bracciano, the process is currently still in the investigation phase. For the second episode, entailing the spillage of sludge deriving from the purification process at the Orvieto landfill site of Acea Ambiente, considering that the presumed offence **has not lead to any environmental impact**, the company has been to the oblation for the prescription of the crime.
Finally it is reported that in the month of December the composting installation of Aprilia was concerned by a measure of urgent preventive confiscation, justified by the persistent presence of odorigenous emissions.

The **environmental complaints of individual users** are not systematically monitored, except in an indirect manner. The majority of the Companies of the Group (such as for example Acea Ato 2, Acea Ato 5, Gesesa and the companies of the Environment Area), indeed, **receive reports principally from the Control Bodies or Relevant Bodies**, to which individual citizens address themselves. The Bodies, therefore, act autonomously with checks on site and, at times, they initiate proceedings and impose penalties, as mentioned above. Exceptionally, it may happen that the Company receives significant reports from individual persons; in this case they will be checked and, where opportune, it will intervene to resolve them.
For the Company which is responsible for **the distribution of energy**, furthermore, observations may be presented entailing presumed environmental harm, which, however, often conceal interests of a town planning nature linked to the reduction of value of the immoveable property assets owned which host electrical installations. Indeed, this concerns **installations indispensable for the correct exercise of the electricity distribution network**, created by Areti following **authorisations granted by Bodies which are custodians of the land** and therefore fully compliant with the legislation of reference, including both town planning and environmental

legislation[95]. The issues/reports will be dealt with by the Assets Unit, which operates in defence of the corporate assets. The Assets Unit receives the notes of dispute from the owners of the immoveable properties which host the **power lines/transformer substations**, and, subsequently, the **Safety/Security Unit carries out the instrumental checks** in response to the disputes. During 2017 **5 environmental checks were processed and closed with a positive outcome** (concerning electromagnetic fields and transformer substations).

THE MANAGEMENT AND CONTROL OF ACTIVITY WITH ENVIRONMENTAL IMPACTS

The Group monitors the processes which have the **potential capacity to generate environmental impacts** and in particular the activities which necessitate the use, or envisage the presence in installations, of materials which are intrinsically dangerous, such as for example sulphur hexafluoride, radon and dielectric oil (see the box *Potentially Dangerous Materials – Sustainable Management*).

POTENTIALLY DANGEROUS MATERIALS – SUSTAINABLE MANAGEMENT

Among the intrinsically dangerous materials managed with awareness and knowledge we recall:

- **sulphur hexafluoride**, present as an isolating fluid in High Voltage electric installations. The management of the gas SF_6 takes place with maximum attention to avoid losses uncontrolled emissions into the atmosphere. The use of adequate sensors and the attentive monitoring of the maintenance operations is envisaged;
- **radon**, a gas deriving from the radioactive decay of the uranium naturally present in the soil, which, in enclosed places, may reach elevated concentrations and be harmful for human health. Acea regularly monitors concentrations of it; the results of the monitoring have highlighted average concentrations always very much below the values set by law;
- **dielectric oil**, a substance used as an isolating and cooling fluid in power transformers. Since the beneficial technological characteristics, but also some environmental critical issues linked to its chemical nature as a derivative of petroleum are known, Acea initiated, already at the end of 2014, an experimentation which uses an **isolating liquid of plant origin**, with technological characteristics that are altogether similar to the mineral oil but with the advantage of being totally **biodegradable and reusable** at the end of their life. The experimentation concerns **three High Voltage/Low Voltage transformers: two with a power equal to 400 kVA and the third with a power equal to 630 kVA**. The transformers were designed and constructed for this experimentation, therefore filled with the new plant oil, and placed into use in 2015. **In 2017**, as already in 2016, **the experimentation**, which includes the monitoring of the performance of the dielectric oil of plant origin, **was pursued**, with the precautionary objective of maximizing trust in this new product reducing to the minimum the possible risks and/or defects connected with its use.

ENERGY AREA

PERIMETER OF REFERENCE

The chapter *Energy Area* includes Areti, Acea Produzione and Acea Ambiente's waste to energy plants. For the first time some of Ecogena's production data has been inserted in a table in the chapter *The use of energy and water*; it is not included in the general data of this chapter. The waste to energy activities are described in detail in the chapter *Environment Area- Waste Management*.

838 GWh
TOTAL PRODUCED ENERGY:
73% FROM RENEWABLE SOURCES
(**608** GWh)

114 TOE/ **1,000**
SAVED FROM CONVENTIONAL
SOURCE AND **360,000**
TONS OF CO_2.

FULL RECONVERSION OF THE
Tor di Valle Power Station
INTO A HIGH EFFICIENCY
COGENERATION PLANT, WITH
CONSIDERABLE ENVIRONMENTAL
BENEFITS EXPECTED

[95] The environmental legislation of reference is in this case the Prime Ministerial Decree of 8 July 2003.

The Acea Group, by means of the operations of companies which are independent of each other, as envisaged by the regulation governing the electricity market, **controls the entire electricity supply chain**. In particular the activities developed by the Group are: the **production** of electricity and heat; the **distribution** of electricity in the area of Rome, where the management of public lighting is included, and Formello; the **sale** of electricity, heat and gas.

At this historic moment the classic electricity supply chain, in Italy, which envisages that a consumer receives the supply of electricity as the result of the contribution of four distinct segments, managed by various parties – producer, grid dispatcher, distributor and vendor –, which operate a separate, albeit integrated, manner, in the value creation chain, is starting to be integrated with a new energy system in which one of the principal players is the **prosumer**. These, by their nature, at the same time, of producer and consumer of energy, are in a position to partially or totally provide their own energy needs and to sell any production surplus to the network, thus establishing new relations both with the distributor and with the party in charge of the sale/collection of energy.

Acea, as well as being engaged in almost all the segments of the supply chain, in the capacity of **producer** of electricity, **distributor** at Rome and Formello and **vendor** across the national territory, has pressed ahead with research in the **smart city** sector and requires to manage also the prosumers connected to its energy distribution network, whose flows of generation and consumption of electricity are no longer unidirectional (see also the box *"Prosumers" Connected to Acea's Network* in the chapter *Customers and Community* and the paragraph *The Commitment to Research and Innovation* in *Institutions and the Company*).

ENERGY GENERATION: FOSSIL AND RENEWABLE ENERGY SOURCES

THE GROUP'S INSTALLATIONS

Acea produces electricity predominantly thanks to **hydroelectric power plants** and also by means of **waste to energy** of **pulpers and Refuse Derived Fuel** (RDF), a primary energy source, derived from waste and in part (about 50%) **renewable**.

The generation from hydroelectric sources (renewable) and thermoelectric from fossil sources – this latter principally by means of a **new hight efficiency cogeneration plant** - is entrusted **to Acea Produzione**; the inventory of generators available to the company is comprised in detail by:

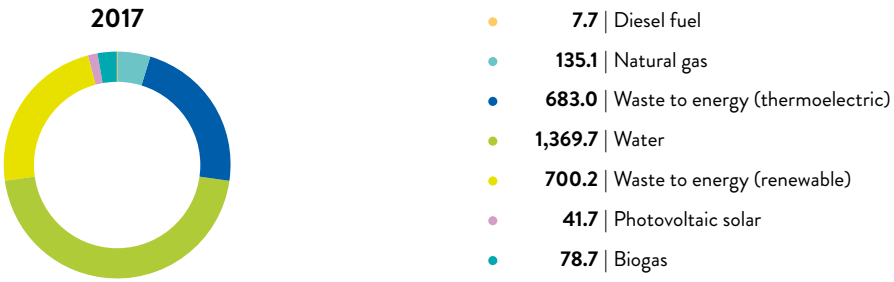
- **7 hydroelectric power stations** located in the Lazio and Abruzzo regions (**122 MW**),
- **2 thermoelectric power stations** located in the territory of the Municipality of Rome: Montemartini (78.3 MW) and Tor Di Valle (19.0 MW)[96], for **97.3 MW_e total installed power available**.

The generation from waste to energy is entrusted to the **company Acea Ambiente**, which assures it by means of **two waste to energy plants** located, respectively, at San Vittore del Lazio and at Terni. The total gross electrical power currently available is equal to about **41 MW_e**.
The installed power generation framework is completed by a small **photovoltaic farm** of about **8.5 MW_e** (see chart no. 43).

ELECTRICITY PRODUCED

The **gross total production of electricity, in 2017**, was about **838 GWh, a slight increase** with respect to the previous year (+14% compared to the 734 GWh of 2016). The increase is due to both to the use, now in place, of all three of the lines of the waste to energy power plant of San Vittore (line one was being revamped up until September 2016), and the entry into use of the high efficiency cogenerative module of Tor di Valle (from August 2017).
The share of electricity generated **by renewable sources**, about **608 GWh**, has proven to be **clearly predominant** and equal to **about 73% of the total**, with a contribution of 380 GWh from hydroelectric, 194.5 GWh from waste to energy, 22 GWh from biogas (Orvieto plant) and 12 GWh from photovoltaic (see graph no. 42 and table no. 49).
With regard to the **share of green energy from waste to energy, about 50%** of the production from this type of plant **is renewable**, being associated to the combustion of the **biodegradable fraction of waste** used as a primary source. In particular, **the renewable share of the fuel** (RDF) entering the **San Vittore del Lazio plant** proves to be equal to **53%** of the total of waste to energy, while in **the Terni plant** this share proves to be around **42%**.

CHART NO. 42 – ELECTRICITY PRODUCED SUBDIVIDED BY PRIMARY ENERGY SOURCE (TJ) (2017)



NB The values reported in the chart are expressed in TJ (1 GWh=3.6TJ).

[96] The Tor Di Valle power station, historically constituted by a cogeneration plant (19.3 MW) and a combined cycle plant (126 MW), has taken the combined cycle plant out of action, whilst it has renovated the cogeneration plant. Tor Di Valle is currently constituted by a single High Efficiency Cogeneration plant.

THERMAL ENERGY PRODUCED

During the course of 2017 the project of extending the district heating network of Mezzocammino district in the zone South of Rome was pursued, which will see Acea Produzione committed for the coming years.
At the Tor di Valle thermoelectric power station about 96 GWh of thermal energy was generated, obtained with the gas turbine group in cogeneration and by means of traditional furnaces.

TABLE NO. 47 - GROSS HEAT PRODUCED BY THE TOR DI VALLE POWER STATION (2015-2017)

gross heat produced (kWh_t)	2015	2016	2017
Tor di Valle Thermoelectric Power Station	80,195,695	90,027,823	96,187,780
Gas Turbine Group in Cogeneration (January-August 2017)	*17,155,344*	*13,172,350*	*11,946,893* (*)
Auxiliary furnaces (Galleri) (January-August 2017)	*63,040,351*	*76,855,473*	*49,323,157* (*)
High Efficiency Cogeneration module (September-December 2017)	*Not stated*	*Not stated*	*34,917,430*

(*) The old plant was in production up until August 2017. The data is relative to the period January – August 2017.

The heat generated is used to serve a basin of about **39,155 inhabitants in the zone South of Rome** (Mostacciano, Torrino, Mezzo Cammino) by means of a district heating network which sever a volume equal to about 3,565,600 cubic metres.

TABLE NO. 48 – THE ELECTRIC POWER STATIONS OF ACEA PRODUZIONE

hydroelectric power stations	thermoelectric power stations
A. Volta di Castel Madama Power Station (Rome) gross power **9.4 MW**	Tor di Valle Power Station: high efficiency cogeneration section (*) (Rome) methane fuel - gross power **19.0 MW**
G. Ferraris di Mandela Power Station (Rome) gross power **8.5 MW**	Montemartini Power Station (Rome) diesel fuel - gross power **78.3 MW**
Salisano Power Station (Rieti) gross power **24.6 MW**	
G. Marconi di Orte Power Station (Viterbo) gross power **20.0 MW**	
Sant'Angelo Power Station (Chieti) gross power **58.4 MW**	
Cecchina Power Station (Rome) gross power **0.4 MW**	
Madonna del Rosario Power Station (Rome) gross power **0.4 MW**	
GENERAL TOTAL: GROSS POWER 219 MW	

(*) The High Efficiency Cogeneration Plant of Tor Di Valle provides the district heating service to the districts of Rome Torrino Sud (South), Torrino 1, Mezzocammino and Mostacciano, for a total of 39,155 inhabitants; it replaces the old cogeneration and combined cycle sections.

In November 2017, the realisation of the modernization project for the Tor di Valle Power Station was completed, which provided for the installation of two high efficiency internal combustion engines of 9.5 MW each, set up in **high efficiency cogeneration** (see the boxes for in depth information).

THE THERMOELECTRIC AND HYDROELECTRIC PLANTS UNDERGOING MODERNISATION

The electricity production system, managed by Acea Produzione, is currently constituted by a set of generation plants, with a total installed power of 227 MW, composed of five hydroelectric power stations (three of which are situated in Lazio, one in Umbria and one in Abruzzo), two "mini hydro" plants, Cecchina and Madonna del Rosario, two thermoelectric plants, Montemartini and Tor di Valle, recently the object of an important repowering completed at the end of 2017.
To this equipment shall be added the photovoltaic plants, for an installed power equal to 8.5 MW.
With regards to the district heating activity, the cogeneration module of the Tor di Valle power station has allowed heat to be supplied to the districts Torrino Sud (South) and Mostacciano (located in the zone South of Rome) for a total of 2,852 users served (251 blocks of flats and 2,601 real estate units).
The productive composition managed originates predominantly from renewable sources with a "green" production equal to 91%.

THE NEW TOR DI VALLE POWER STATION – HIGH EFFICIENCY COGENERATION PLANT (CAR)

With reference to the thermoelectric power stations, in 2017 the decommissioning of the combined cycle section of the Tor di Valle Power Station was brought to an end. In continuity with the decommissioning phase works of **reconversion into a high efficiency cogeneration plant** were initiated. In particular the reconversion of two historic plants has been brought to a conclusion, a combined cycle (CCGT- Combined Cycle Gas Turbine) and a cogeneration plant (CHP- Combined Heat and Power), **in a single high efficiency cogeneration plant**, equipped with two engines in a high efficiency cogeneration set-up, each one with electrical power of 9.5 MW, for a total of 19 MW, as well as three integration furnaces and 8 storage tanks, functional both to the supply of thermal energy to the districts of Roma in the South zone - Torrino Sud (South), Mostacciano and Mezzocammino - and to the supply of electricity to all of the electricity users of the Rome South Purifier. Among the benefits which shall be pursued there are highlighted: **the optimization of the consumptions** of fuel, the **greater yield** of the machine and the **reduction of emissions** into the atmosphere thanks to the adoption of the Best Available Technologies (BAT) which intervene in relation to the fume lines of the engines and the type of furnace burners used, as well as the system of monitoring of the emissions into the atmosphere.
After the completion of the construction of the plant, which occurred in November 2017, it was proceeded to initiate the decommissioning of the old cogeneration module constituted by an open cycle gas turbine of 19 MW of electricity, in use from the early 80's.
The **calculation of the environmental benefits**, carried out in the basis of the exercise envisaged for 2018, leads to a **reduction of 12.8% of the emissions of CO_2**, equal to a saving of about 5,500 tonnes[97].

The installed capacities, which **overall amount to about 278 MW**, are represented in chart no. 43, distinguished by energy source.

CHART NO. 43 – INSTALLED ELECTRICAL POWER OF THE GROUP SUBDIVIDED BY ENERGY SOURCE (MW) (2017)

(*) There are photovoltaic MW under the responsibility of Acea Produzione.

The activity of **modernizing Acea's Produzione's hydroelectric plants and making them more efficient** is continued: after the works performed in previous years at the Guglielmo Marconi, Salisano and Alessandro Volta power stations, in February 2017 the works of **revamping the facilities of the Alessandro Volta di Castel Madam Power Station** came to an end.

The set of works will allow, on the basis of the condition of power installed and authorised in concession, **the use of the available water resource to be optimised**. Furthermore the **works of revamping** of the facilities of the **Galileo Ferraris di Mandela Hydroelectric Power Station**, also located in the province of Rome were initiated in November.

TABLE NO. 49 - ELECTRICITY PRODUCED (BY PRIMARY ENERGY SOURCE) (2015-2017)

primary energy source	2015	2016	2017
	TJ (GWh) (*)		
ELECTRICITY PRODUCED (BY PRIMARY ENERGY SOURCE)			
diesel	6.6 (1.84)	4.3 (1.2)	7.7 (2.2)
natural gas (cogeneration)	40.3 (11.2)	32.0 (8.9)	135.2 (37.6)
waste to energy (for 2017: about 49.5% of the total)	565.6 (157.1)	562.3 (156.2)	682.9 (189.7)
thermoelectric total	**612.5 (170.1)**	**601.9 (167.2)**	**825.8 (229.4)**
hydro	1,617.1 (449.2)	1,402.8 (389.7)	1,369.7 (380.5)
waste to energy (for 2017: about 50.5% of the total)	459.3 (149.8)	613.8 (170.5)	700.2 (194.5)
biogas	-	59.8 (16.6)	78.7 (21.9)
solar photovoltaic(**)	50.0 (13.9)	39.2 (10.9)	41.7 (11.6)
renewable total	**2,126.4 (612.9)**	**2,115.7 (587.7)**	**2,190.4 (608.4)**
general total	**2,738.9 (783.0)**	**2,717.6 (754.9)**	**3,016.4 (837.9)**

(*) 1 GWh= 3.6 TJ.
(**) Photovoltaic includes the production at the plants of the water area (Acea Ato 5) and at the waste management plant of Orvieto, for a total of 2.2 GWh produced.

[97] The calculation was made determining the quantity of primary energy saved with respect to the separate production of thermal energy and electricity, using the calculation method in use to determine the energy efficiency certificates.

ENERGY DISTRIBUTION

THE DISTRIBUTION NETWORKS

DISTRIBUTION NETWORK – IN ROME AND FORMELLO: **30,900** KM

APPROXIMATELY **11,000** GWH OF ELECTRICAL POWER DEMAND ON OUR NETWORK

TERRITORIAL PROTECTION INDEX INCREASED (UNDERGROUND AT NETWORK OUT OF TOTAL AT NETWORK): **44%**

EFFICIENCY ENHANCEMENT ACTIONS ENABLED REDUCING CO_2 EMISSION BY **2,600** TONS

Areti manages the **electricity distribution network** at Roma and Formello, extending over **about 30,900 km** and capable of supplying a basin of about 2.8 million resident inhabitants. The company, by volumes of electricity required on the network, equal to about 11,000 GWh/year, is the third Italian operator of the sector. In table no. 50 the principal plant data is described with reference to the primary and secondary substations and to the overhead and underground distribution lines.
The environmental indicator correlated to the **protection of the land** and calculated as a percentage share **of the underground high voltage network** (AT) **in relation to the total of the high voltage lines in use** (overhead and underground) **has improved**. The data, monitored by year, in 2017 has again proven to be higher than the previous years, equal to **44%** (43% in 2016); that is the effect also of the **transformation and modernisation of the** high and very high voltage electricity distribution networks.

With reference to the **electric and magnetic area**, in particular relative to the primary transformer substations, High and Medium Voltage overhead electricity lines and secondary transformer cabins, the possible risks for the health of employees and the community of reference are dealt with, respectively, in the **Risks Evaluation Document and** in the **Corporate Environmental Analyses Document**. Areti conducts **periodic sample checks** in the **company's sites**, carried out also following reports by users/customers or External Bodies. Additional checks are conducted by ARPA Lazio (the local communityal Environment Protection Agency for Lazio)[98], following specific requests by customers.

MEMORANDUM OF UNDERSTANDING FOR THE REARRANGEMENT OF THE ELECTRICITY NETWORK

In 2017 works were continued in the context of the **plan to modernise the high voltage electricity distribution network (150 kV)**, defined in the **Memorandum of Understanding** signed in 2010 among Areti SpA (formerly Acea Distribuzione), the Municipality of Rome and Terna SpA, **which concerned, in particular**:

- the activation of the new 150 kV "Cassia-Flaminia/O" line, of which 4.7 km in overhead line, constructed with green coloured pylons and tubular supports consistently with the requirements of the Veio Park Body, 0.91 km in overhead lines which reuse existing posts and 0.45 km in underground cables;
- the commencement of the demolition of the 150 kV Rome North-Cassia overhead line, for a total of 9.8 km and 39 supports, consequent upon the activation of the high voltage line mentioned in the preceding point;
- the completion of the demolition of the 150 kV Flaminia-Bufalotta overhead lines, for a total of 9.2 km (of which 2.9 km on piling shared with Terna) and 23 supports;
- the commencement of construction works for the new 150 kV "Rome North-San Basilio" line, relative to the stretch to be adjusted for a length of 5.5 km with green coloured pylons and tubular supports, consistently with the requirements of the Rome Nature Body.

The modernisation plan will lead to benefits of a social and environmental nature; indeed, when completed, thanks to lower overall losses of energy, both an improvement in the quality of the electricity services will be obtained and a relevant expected energy saving, **for about 58 million kilowatt hours**, which correspond to the annual consumption of about 20 thousand families.

The management of the electricity distribution network of Rome and is characterised by the **continuous improvement of the performances**, with particular attention to energy efficiency. Indeed, **various initiatives to reduce losses** are pursued, which range from the progressive replacement of the levels of medium voltage from 8.4 kV to 20 kV, to the installation of low loss transformers. The activities performed in the context of the **smart grid** which aim to **improve the performances of the networks** thanks to the evolution and integration of management systems and, in general, the applications of technological innovation in the management of the network, are illustrated in the chapter *Institutions and the Company*.
Also in virtue of the activities recalled, the **losses of energy across the network** during the year have transpired to be equal to **about 6.9% of the total transmitted**.

[98] According to the following legislative references: Legislative Decree no. 81/08; Italian Electro-technical Committee Guide 211-6 first ed. of 01/2001; Prime Ministerial Decree 8/7/2003 "Fixing of the limits of exposure, the values of attention and the quality objectives for the protection of the population from electric and magnetic fields at the network frequency (50Hz) generated by the power lines".

TABLE NO. 50- ENVIRONMENTAL INDICATORS: AMOUNT OF INSTALLATIONS AND OVERHEAD AND UNDERGROUND DISTRIBUTION LINES (2015-2017)

Areti

systems and output	u.m.	2015	2016	2017
High Voltage/High Voltage - High Voltage/Medium Voltage primary sub-stations	no.	71	71	71
High Voltage/High Voltage and High Voltage/Medium Voltage transformers	no.	169	170	169
transformation power	MVA	7,764	7,924	7,921
sub-stations in use	no.	13,124	13,152	13,159
Medium Voltage/Medium Voltage - Medium Voltage/Low Voltage transformers	no.	12,797	12,831	12,832
transformation power	MVA	6,154	6,183	6,203
overhead and underground networks				
high voltage network - overhead lines	km	323	321	310
high voltage network - underground lines	km	239	243	243
medium voltage network - overhead lines	km	440	429	419
medium voltage network - underground lines	km	10,086	10,180	10,137
low voltage network - overhead lines	km	1,648	1,646	1,641
low voltage network - underground lines	km	17,723	17,917	18,147

ENVIRONMENT AREA - WASTE MANAGEMENT

PERIMETER OF REFERENCE

The chapter includes the activities of the waste treatment plant which occupies itself with the collection, recovery, treatment and disposal of waste, the waste to energy plants, the compost production plants, all in Acea Ambiente.

HIGH QUALITY COMPOST PRODUCTION INCREASED: **+27%** AS COMPARED TO 2016 AT THE ORVIETO, APRILIA AND MONTEROTONDO MARITTIMO PLANTS

APPROXIMATELY 12,700 kNm^3 OF BIOGAS PRODUCED AND **22 GWh** OF ENERGY PRODUCED FROM BIOGAS (AT THE ORVIETO PLANT)

384 GWh OF ENERGY PRODUCED BY WASTE INCINERATION: **+17.6%** AS COMPARED TO 2016, DUE TO THE FULL OPERATIVITY OF THE SAN VITTORE LINE 1

APPROXIMATELY **446,000 t** OF INCINERATED WASTE (INPUT) AND APPROXIMATELY **97,000 t** OF WASTE PRODUCED BY WASTE INCINERATION (OUTPUT): **22% (OUTPUT/INPUT)**

Italy, and Europe more generally, are on the eve of an ambitious relaunch of the waste management policies, towards a **greater circularity of resources**. The new and more challenging objectives proposed by the "package on the Circular Economy" will have a strong impact on the Country system as a whole. Acea has as its target contributing to these objectives.

ACEA AT ECOMONDO

The XXI edition of **Ecomondo** at the Rimini Trade Show took place from 7 to 10 November 2017. Also this event was chosen by the Group as an **occasion to disseminate the culture of socio-environmental respect** and to **present the new industrial reality of Acea Ambiente** and the industrial activities and initiatives connected to it.
In the **Acea exhibition space three seminars were held in relation to innovative technologies connected with the recovery of matter and energy** from discards and waste; in particular the general lines of an industrial project for an innovative plant destined for the thermo-chemical treatment of sludge from biological purification were presented. This plant will allow matter to be recovered from sludge, in the form of a product that is usable for subsequent industrial applications, providing an effective operational response to the so called "closure of the sludge cycle".

Acea, has chosen to return new life to the matter managing, since 2006, the waste cycle in such a manner as to recover, recycle and reuse the waste itself as much as possible and, when possible, to recover energy. The Group, in particular, occupies itself with the following phases of the waste cycle:

- **treatment of municipal solid waste** (MSW) and other types of waste (green from differentiated collection, industrial waste, etc.), **with recovery of material** (glass, plastic, iron, other metals, paper and cardboard) and landfill disposal of the leftovers;
- **incineration with recovery of energy;**
- **production of high quality compost** to be directed towards agriculture.

The company **Aquaser**, furthermore, controlled by Acea, collects and manages **the sludge produced from the civil waste water purification cycle**, in order that it shall be treated and disposed of as best as possible, privileging the recovery of matter and energy.
Hereinafter some operational aspects linked to the activities cited are discussed in depth, in order to highlight which are **the advanced technologies, necessary to make waste management modern and efficient**.

INTEGRATED WASTE TREATMENT AT THE ORVIETO PLANT

The company **Acea Ambiente** manages in Umbria, in the municipality of Orvieto, an important facilities pole for the treatment of urban waste. The principal activities performed are the **selection, composting and storage in landfill**, respecting the Certified Management Systems (see *Corporate Identity*, *Management Systems*), seeking to obtain **the maximum recovery of materials** and favouring both the **production of energy from renewable sources** and the **reduction of waste to be disposed of in landfill**. In 2017 the total waste entering the plant was equal to 88,273 tonnes, of which 43,601 tonnes (about 49%) was on the whole disposed of in landfill and almost all of the remainder was sent to the anaerobic digestion section. For more details see *Environmental Accounts*.
The **line** of **anaerobic** treatment of the organic matrix of the waste has allowed the **production of electricity from the biogas fuel** released in the process. In particular, in 2017, **the biogas produced from the anaerobic line** was equal to about **3.5 Mm³**, and about **6.8 GWh of energy produced** was transferred to the electricity grid. The plant **to make efficient use of the biogas from landfill**, furthermore, has **produced about 9.2 Mm³ of biogas** and **has transferred about 13.8 GWh of energy to the grid**.
The pole of Orvieto is also equipped with a **photovoltaic plant**, managed by Acea Produzione, which generated about 560 MWh in 2017, used to cover part of the plant's consumption of electricity. Taken as a whole, the new biogas treatment line, the plant making efficient use of the biogas from landfill and the photovoltaic plant have allowed **a transfer to the electricity grid equal to 3,870 TOE (Tonnes of Oil Equivalent)**.

WASTE TO ENERGY

The recovery of energy from waste, this also being part of the EU's package of the Circular Economy, as well as bringing advantages of an energy–economic type, allows the **notable volumetric reduction and the biological stabilization of waste** to be obtained, avoiding as far as possible the disposal of this waste in landfill as such.

Acea Ambiente manages, in addition to the activities already described, also the waste to energy process, by means of **two plants**, one at San Vittore del Lazio and the other at Terni, which operate according to the Certified Environmental Management Systems ISO 14001:2004 and have obtained the European EMAS (Eco-Management and Audit Scheme) registration; both manage the health and safety aspects according to the OHSAS (Occupational Health and Safety Assessment Series) 18001:2007 (see *Corporate Identity*, *Management Systems*).

The Plant of San Vittore del Lazio is comprised by **three independent lines** of waste to energy designed to be fed with fuel waste-derived fuel (WDF), now called Secondary Solid Fuel (SSF), with these characteristics:

- 52 MWt of thermal power installed for line 1 and 56.7 MWt of thermal power installed for each of the other two lines;
- 12 MWt of electric power installed for line 1 and 14.5 MWt of each of the other two lines;
- about 400,000 t/year of SSF as total capacity processed under the regime[99].

2017 was the first full year of **activity for line 1 after the revamping** (it entered into use on 30.09.2016); the **effective electrical power available is currently 41 MW**, with which about **300 GWh** of electricity has been produced. In 2017 energy from waste has been generated from about **345,600 tonnes of waste**.
The plant of San Vittore performs a significant role in the management of the urban waste of the local community of Lazio, both for the particularly advanced technologies, used for its construction, and for the considerable processing potentiality which it possesses.

[99] In May 2017 the plant was authorised to use the 3 lines of combustion up to a total processing capacity of 397,200 t/year.

TABLE NO. 51 – THE WASTE TO ENERGY PLANT OF SAN VITTORE DEL LAZIO: OPERATING DATA (2015-2017)

	u.m.	2015	2016	2017
fuel converted from waste to energy	t	239,871	281,917	345,639
gross electricity produced	GWh	225.35	243.68	301.15
conversion efficiency (*)	kWh/kg SSF	0.94	0.86	0.87

(*) Relationship between gross electricity produced (GWh) and quantity of SSF converted from waste to energy (t).

NEW CONVEYOR BELTS AT SAN VITTORE

Thanks to the collaboration between Acea and the Magaldi Group, the waste to energy plant of San Vittore del Lazio (Frosinone) has implemented - the **first application of its type in Waste to Energy** (WtE) - an **innovative system for transporting the heavy ash** deriving from the combustion of SSF (Secondary Solid Fuel). The plant application created, which is characterised in the Ecobelt® WA system, comprises two conveyor belts, each with an wheelbase of about 16 metres, replacing the two conveyor chains immersed in a bath of water, in use during the last 6 years. The installation of the Ecobelt® WA system at the plant of San Vittore **has made the use of water superfluous** to cool the heavy ash – water which is therefore now saved – and continues the progressive improvement of operational issues which could have occurred in particular conditions of use of the previous system; furthermore, at the same time the efficiency of the furnace, with the **recovery of energy** from the heat of the heavy ash, and the **reduction of the consumption of electricity** for the operation of the conveyors themselves.

The plant of Terni is comprised of a **single waste to energy line** and has the following characteristics:

- 52 MW_t of thermal power installed;
- 12.33 MW_t of electrical power installed;
- 100,000 t/year of discards from the pulper (discards from the paper mill, deriving from the "pulping" of the waste paper), as total processed capacity.

TABLE NO. 52 – THE WASTE TO ENERGY PLANT OF TERNI: OPERATING DATA (2015-2017)

	u.m.	2015	2016	2017
pulper waste converted to energy	t	99,892	99,768	99,970
gross energy produced	GWh	81.52	83.07	83.10
conversion efficiency (*)	kWh/kg pulper	0.82	0.83	0.83

(*) Relationship between gross electricity produced and quantity of pulper waste converted to energy.

The plant of Terni is also equipped with a **photovoltaic plant**, which in 2017 has generated about 403 MWh of electricity, in part consumed on site and in part transferred to the grid.
For the data regarding the emissions of the waste to energy plants see the chapter *Air emissions*.

HIGH QUALITY COMPOST PRODUCTION

The scope of the activities managed by Acea Ambiente includes also the sector of services which are complementary to the integrated water cycle, with **the recovery and disposal of sludge from biological purification** and of waste deriving from the purification of water.
The **sludge from purification** and the **organic fraction of municipal solid waste (MSW)** are treated by three plants which produce **compost** and are to be found, respectively, at Aprilia and Sabaudia (both in the province of Latina) and at Monterotondo Marittimo (in the province of Grosseto).
In 2017 **Aquaser**, which performs the activity of **transporting and disposal of sludge** from biological purification and waste deriving from the purification of water, of treatment of waste water and liquid waste, **managed**, inter alia, about 163,400 t of sludge from purification coming from the water companies of the Group, of which 117,300 tonnes of sludge from Acea Ato 5 and Acea Ato 2.
The dried out and dehydrated slurry coming from the companies of the Group[100] has followed the following end destinations:

- 76% to material recovery operations (pretreatments aimed at agricultural use - conditioning, composting);
- 7% to recovery of energy (waste to energy).

The remaining 17% has been disposed of. The direct spillage has not been used in agriculture.

In line with a perspective of **sustainable growth**, and in order to act to **combat clime change**, the Environment industrial area has set itself the objective of **transforming the two composting plants** of Aprilia and Sabaudia **into integrated composting and anaerobic digestion plants**, in such a manner as to be able to use the biogas produced and generate energy from renewable sources. At Aprilia the phase of creating the aforesaid plant has been reached[101] and it is hoped to end the works and place the plant into use by 2019.

[100] The sludge of which Aquaser has managed the entire supply chain, from loading to transporting and final disposal have come from the following companies of the Group: Acea Ato 2, Acea Ato 5, Acquedotto del Fiora, Umbra Acque and Publiacqua.

[101] The creation of the first of three lots into which the extension of the site has been subdivided was completed in 2017.

WATER AREA

SCOPE OF REFERENCE

The scope of reference includes the companies Acea Ato 2, Acea Ato 5 and Gesesa.
Acque, Gori, Acquedotto del Fiora, Publiacqua and Umbra Acque, water companies not included in the scope of the consolidated Non-Financial Statement (pursuant to Legislative Decree no. 254/2016). They have been included only in the area of reporting of water graphs, where their contribution is immediately evident, and in a few other global data (water fed into the system and analytical calculations). Specific data concerning these companies are provided in a separate chapter, *Water Company data sheets and overseas activities*.

384 Mm³ OF POTABLE WATER SUPPLIED BY ACEA ATO 2, ACEA ATO 5 AND GESESA

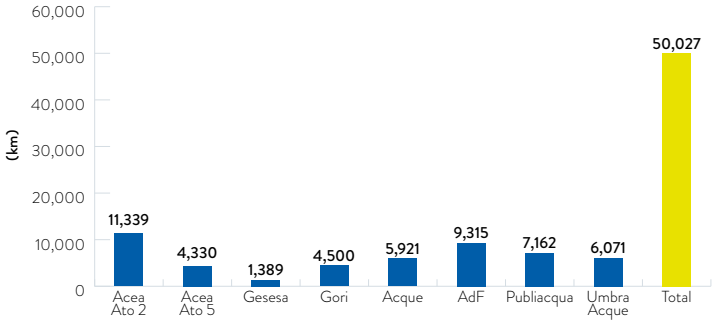
HISTORICAL ROME NETWORK: ACTUAL LEAKS DROPPED BY **41%**

MORE THAN **17,000 km** OF POTABLE WATER NETWORK MANAGED BY ACEA ATO 2, ACEA ATO 5 AND GESESA

MORE THAN **409,300** ANALYTIC CALCULATIONS ON DRINKING WATER (ACEA ATO 2, ACEA ATO 5 AND GESESA)

The **management of the water resource** in all the phases envisaged by the **integrated water service** is one of the Group's **core companies**. Work is carried out with increasing focus on the conservation of water and preserving its quality, which is expressed, for example, in the work to recover losses (see the dedicated box in the paragraph on *Sustainable management of the Water Resource*), in the aforementioned **protection of the sources** (*Protection of the land* paragraph) and possible search for new sources and also in an increasingly accurate **monitoring** of water consumption, with the aim of containing it.
The **total** pool of users served in Italy **by the Group**[102] is about 8.9 million inhabitants, with **volumes of drinking water fed** into the network in 2017 equal to about **1,264 million cubic metres (in 2017)**. The volumes of **drinking water introduced by Acea Ato 2, Acea Ato 5 and Gesesa** amounted to 735 million cubic metres, with a total supply of 384 million cubic metres for **4.6 million inhabitants** served. For specific data on the three companies, see the *Environmental Accounts*.
In **Ato 2-Lazio centrale** alone, comprising the city of Rome and 111 other municipalities - of which 79[103] under management at 31 December 2017 - the **volume of water fed into the network** serving the approximately 4 million inhabitants, was approximately **630 million cubic metres** (of which 477 million cubic metres in the "historical network" of Rome and Fiumicino).[104]

CHART NO. 44 – THE WATER DISTRIBUTION NETWORK OF THE GROUP IN ITALY (2017)



NB The network kilometres include the water systems.

WATER QUALITY

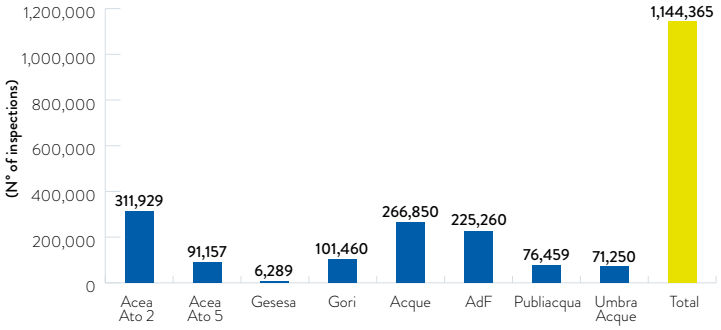
The **checks on the quality of the drinking water** supplied and of effluent returned to the environment, after the process of purification, are performed in a programmed manner by the companies of the water industrial area. The **analyses** on the **drinking water** distributed to users play an **essential role** for the resulting health spin-offs. A summary of the work carried out in this area, by all the water companies, is shown in chart no. 45.

[102] As specified at the start of the chapter, the data of the total inhabitants served by the water business, of the volume fed into the network, and the size of the networks and checks on the water (shown in special graphs) include all the operational companies in the Group, also those not included within the scope of the consolidated Non-Financial Statement.

[103] In 17 other municipalities the integrated water service was managed partially.

[104] The items of the water balance of the past three years were calculated using the calculation criteria supplied by ARERA (formerly AEEGSI).

CHART NO. 45 - ANALYTICAL CHECKS ON DRINKING WATER, TOTAL AND PER COMPANY (2017)



In **Rome**, the water supplied for drinking use comes mainly from **uncontaminated sources**. The quality features of the resource collected and distributed are monitored through **continuous investigations**, with instruments located along the water systems and through daily sampling at the collectors and in the distribution network. In **the Lazio area**, in **territories of volcanic origin**, there are areas where the water has drinkability problems, linked to the natural presence of some substances in greater concentrations compared to those permitted by the relevant legislation. In these areas Acea Ato 2 has performed, over the years, **a number of initiatives aimed at solving these problems**. In particular it built **38 purification (drinking water) plants** able to remove the unwanted substances and returning their values of concentration well below the legal limits.
Regular monitoring of the chemical/biological parameters of the water which circulates in the distribution network of the water system allows the quality safety level to be kept high.
A total of **approximately 312,000 analyses** were carried out in Ato 2 during 2017, in addition to those performed by the Health Authority.

The analytical checks on the water and the relative measurements are performed both by companies in the Group independently and **via laboratories**. The subsidiary **Acea Elabori, accredited pursuant to the ISO/IEC 17025 standard, performs and certifies chemical and physical and bacteriological analyses** in different substrates, including water (see Table no. 53 for the analyses performed for Acea Ato 2 and Acea Ato 5). Gesesa instead uses two outside laboratories (see the *Environmental Accounts* or the Gesesa data and also for the aggregate data).

TABLE NO. 53 - ENVIRONMENTAL INDICATORS: ANALYSES IN ROME AND FROSINONE (2015-2017) AND QUALITY PARAMETERS OF THE DRINKING WATER DISTRIBUTED TO ROME, FROSINONE AND BENEVENTO (2017)

ANALYSES PERFORMED BY ACEA ELABORI - ATO 2-CENTRAL LAZIO AND ATO 5-SOUTHERN LAZIO (2015-2017)

type of water analysed	no. of analyses		
	2015	2016	2017
drinking water Acea Ato 2	320,946	347,886	311,929
drinking water Acea Ato 5	80,440	85,642	91,157
effluent Acea Ato 2	155,355	145,553	199,979
effluent Acea Ato 5	-	-	8,800
surface water Acea Ato 2	40,562	36,922	31,924
total	**597,303**	**616,003**	**643,789**

ANALYSES PERFORMED BY ACEA ELABORI ON DRINKING WATER - ROME HISTORICAL NETWORK (2015-2017)

sampling area	no. of sampling points	no. of samples			no. of analyses		
	2017	2015	2016	2017	2015	2016	2017
collection	45	602	469	423	22,556	21,085	21,636
water system and water feed pipes	26	310	158	183	9,411	6,051	6,599
tanks/water centres	21	274	248	119	10,471	8,974	4,988
distribution networks	320	3,965	4,208	3,381	137,053	135,943	109,838
total	**412**	**5,151**	**5,083**	**4,106**	**179,491**	**173,702**	**143,061**

AVERAGE CHEMICAL AND MICROBIOLOGICAL PROPERTIES OF THE DRINKING WATER DISTRIBUTED AT ROME, THE MUNICIPALITIES OF ACEA ATO 5 AND BENEVENTO (2017)

parameters	unit of measurement	average value Rome	average value Acea Ato 5 municipalities	average value Gesesa (Pezzapiana site)	legal parametric value (Legislative Decree no. 31/01)
turbidity	NTU	<0.5	1.1	0.99	no anomalous changes
temperature	°C	12.7	13.5	exempted (*)	n.a.
hydrogen ions concentration	pH unit	7.5	7.6	7.5	>6.5 and <9.5
electrical conductivity	µS/cm at 20°C	577	482	870	<2,500
chlorides	mg/L Cl	9.2	7.9	45	<250
sulfates	mg/L SO_4	17.6	9.1	63.4	<250
calcium	mg/L Ca	97.6	85	exempted (*)	n.a.
magnesium	mg/L Mg	19.0	14.8	exempted (*)	n.a.
sodium	mg/L Na	7.96	6.0	31.0	<200
potassium	mg/L K	5.2	2.1	exempted (*)	n.a.
hardness	°F	32.2	27.0	35.6	(**)
free residual chlorine	mg/L Cl_2	0.14	0.18	0.15	(***)
alkalinity	mg/L $CaCO_3$	328	285	exempted (*)	n.a.
calculated fixed residue	mg/L	412	420	635	(****)
nitrates	mg/L NO_3	4.30	5.2	34.4	<50
nitrites	mg/L NO_2	<0.05	0.3	<0.01	<0.50
ammonia	mg/L NH_4	<0.10	0.3	exempted	<0.50
fluorides	mg/L F	0.22	0.17	0.5	<1.50
bicarbonates	mg/L HCO_3	400	347	exempted (*)	n.a.
total organic carbon	mg/L C	0.63	0.63	exempted (*)	no anomalous changes
iron	µg/L Fe	11.7	34.0	<20	<200
copper	mg/L Cu	0.002	0.00	<0.005	<1.0
lead	µg/L Pb	0.45	0.5	<5.0	<10
cadmium	µg/L Cd	<0.2	0.5	<2.0	<5.0
chromium	µg/L Cr	<5.0	<5.0	<5.0	<50
nickel	µg/L Ni	<2.0	3.2	<5.0	<20
manganese	µg/L Mn	0.54	3.6	<5.0	<50
arsenic	µg/L As	1.61	5.0	exempted (*)	<10
vanadium	µg/L V	3.21	3.5	<5.0	<140
total trihalomethanes	µg/L	1.72	2.6	<1.0	<30
trichloroethylene	µg/L	<0.10	<0.10	<1.0	<10
tetrachloroethylene	µg/L	<0.10	<0.14	<1.0	<10
1.2 - dichlorethane	µg/L	<0.30	<0.30	<0.1	<3.0
benzene	µg/L	<0.10	<0.10	exempted (*)	<1.0
benzo(a)pyrene	µg/L	<0.003	<0.004	exempted (*)	<0.010
coliform bacteria at 37°C	MPN/100 ml	0	0	0	0
Escherichia coli	MPN/100 ml	0	0	0	0
Enterococci	CFU/100 ml	0	0	0	0

(*) In accordance with Legislative Decree no. 31/01 and in agreement with the health authority, Gesesa is exempted from supplying the parameter.

(**) Recommended values: 15-50 °F - the lower limit applies to water subjected to softening or desalination treatment.

(***) Recommended value 0.2 mg/l.

(****) Maximum value recommended: 1,500 mg/l.

SEWERAGE SERVICE AND TREATMENT SYSTEM

APPROXIMATELY **118,900 t** OF SLUDGE PRODUCED BY ACEA ATO 2, ACEA ATO 5 AND GESESA, **75%** OF WHICH WAS RECOVERED

APPROXIMATELY **9,300 km** KM OF SEWAGE SYSTEM MANAGED AND **319** PURIFICATION PLANTS (ACEA ATO 2, ACEA ATO 5 AND GESESA)

ROMA EST PURIFICATION PLANT: PRODUCED SLUDGE DROPPED BY MORE THAN **76%**

The integrated water service (IWS) includes management of the **sewer and purification system**. The water resource, after uses for the various civil purposes, is **collected through the sewer pipes** and sent to the purifiers. There **pollutants are removed via physical processes** (filtering, sedimentation, flocculation) and **biological ones** (aerobic and/or anaerobic decomposition of the organic substance with bacteria).
The water in output from the plants, after having undergone the purification treatments described, **has chemical and biological properties compatible with the life of the receiver body of water** and in accordance with the values of the parameters which must not be exceeded in order to guarantee full compatibility, as governed by Legislative Decree no. 152/2006, in its third part.
Thanks to **approximately 850 purification plants** (of which a total of **319** managed by Acea Ato 2, Acea Ato 5 and Gesesa), **the total volumes of water treated by the Group**[105] were, in **2017, approximately 815 million cubic metres**.
The sewers managed are equal to approximately **25,200 km**.

CHART NO. 46 – SEWER NETWORKS OF THE GROUP IN ITALY (2017)

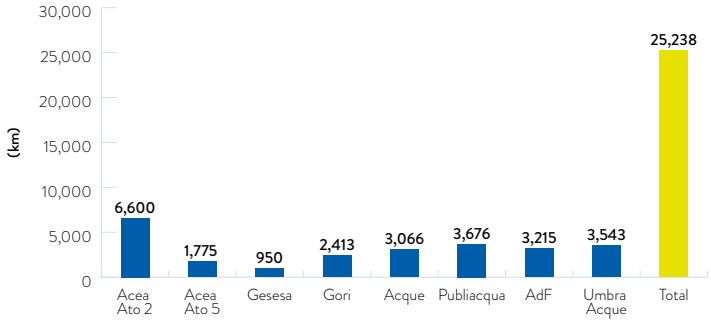
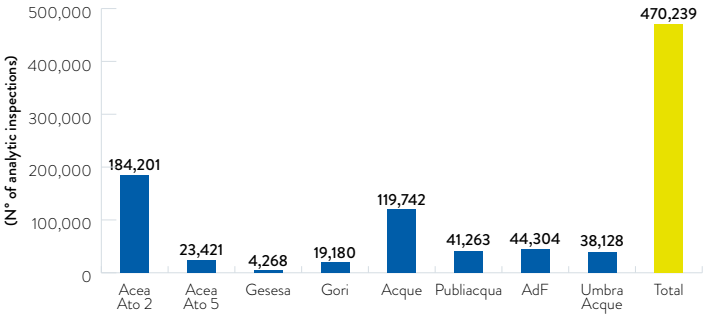


CHART NO. 47 - ANALYTICAL CHECKS ON EFFLUENT, TOTAL AND PER COMPANY (2017)



For the companies operating in the Lazio area and partly in the province of Benevento, the percentage coverage of the sewer and purification services, out of the total users served by the water service, and the volumes of effluent treated are given in Tables nos. 54 and 55.
In particular, for **Acea Ato 2**, the good abatement performances achieved in the purification process, which allowed approximately 550 million cubic metres of sewage to be made compatible with the receiver ecosystem, were confirmed by the over **184,000 calculations** performed **on the water treated** before discharge. A **positive result** was in fact confirmed, i.e. values of the concentrations of the contaminants below legal limits, **in 93% of cases**, moreover in an environmental situation which foresees the observance of some of the strictest regulations in Italy.

[105] In this case too the data relating to the number of purification plants, to the volumes treated, the size of the networks and the checks refer to all the companies in the Group operating in the water sector.

TABLE NO. 54 - PERCENTAGE COVERAGE OF THE SEWER AND PURIFICATION SERVICES OVER THE TOTAL UTILITIES OF THE WATER COMPANIES OPERATING IN LAZIO AND AT BENEVENTO (2015-2017)

company	2015		2016		2017	
	sewer	purification	sewer	purification	sewer	purification
Acea Ato 2	88.5%	84.9%	91.9%	88.7%	91.7%	88.0%
Acea Ato 5	66.5%	54.6%	64.0%	52.5%	67.7%	56.5%
Gesesa	81.0%	25.4%	81.1%	26.2%	81.2%	26.1%

TABLE NO. 55 - VOLUMES OF EFFLUENT TREATED BY WATER COMPANIES OPERATING IN LAZIO AND AT BENEVENTO (2015-2017) (Mm^3)

company	2015	2016	2017
Acea Ato 2	623.1	595.2	553.6
Acea Ato 5	27.0	26.7	21.1
Gesesa (*)	-	-	-

(*) For the time being there are no flow meters at the entry of the purification plants managed by Gesesa. The company intends installing them over the next two years.

In the "historic" area managed by Acea Ato 2, which includes Rome and Fiumicino, the **main purification plants treated in 2017 approximately 467 million of cubic metres of effluent**, a figure showing a downturn (514 million cubic metres of effluent treated in 2016). Considering also the smaller purifiers and the plants of the municipalities acquired in Ato 2 (a total of 170) a **total volume of approximately 554 million cubic metres of effluent treated is obtained**, a decrease of 7% compared to 2016. The cause of this reduction depends substantially on the particularly dry year, since part of the rainwater also flows into the Rome drains system.

The detail of the main output parameters of the purifiers of Acea Ato 2 and of Acea Ato 5 is given no. 37 - Social indicators: staff movements (2016-2017) in Tables nos. 56 and 57.
Other indicators of the efficiency of purification are described in the section *Key environmental performance indicators - Water Area* of the *Environmental Accounts*.
Gesesa, considerably smaller in size than the other two companies, has in any case programmed an investments plan which includes the installation of meters of flow entering the purification plants in the next two years.

TABLE NO. 56 - OUTPUT PARAMETERS OF THE MAIN PURIFIERS MANAGED BY ACEA ATO 2 SPA – MUNICIPALITY OF ROME (2017)

	Roma Sud purifier	Roma Nord purifier	Roma Est (*) purifier	Ostia purifier	limits of concentration in surface water (Legislative Decree no. 152/06)
parameter			average of values (mg/L)		
BOD_5	14	6	14	3	≤ 25
COD	49	15	43	18	≤ 125
TSS	18	9	20	5	≤ 35
nitrogen (ammoniacal, nitric and nitrous)	8	7	13	8	-
phosphorus	1	1	2	1	-
			quantities removed (t)		
COD	13,534	1,128	3,584	368	-
TSS	5,035	682	1,672	111	-

(*) The data of the Roma Est purifier are in part influenced by the various maintenance works carried out at the plant during the year.

TABLE NO. 57 - OUTPUT PARAMETERS OF THE MAIN PURIFIERS MANAGED BY ACEA ATO 5 SPA – MUNICIPALITY OF FROSINONE (2017)

parameter	average of values (mg/L)	limits of concentration in surface water (Legislative Decree no. 152/06)
BOD_5	7.8	≤ 25
COD	44.7	≤ 125
TSS	13.1	≤ 35
NH_4^+	2.5	-
phosphorus	1.1	-
	quantities removed (t)	
COD	1,930	
TSS	780	

The sludge produced during the purification process **is mostly** sent for recovery of material (see in *Environment Area*, the paragraph *High quality compost production*). In 2017 the **anaerobic digester** of the Roma Est purifier, managed by Acea Ato 2, worked in continuous mode. This led to a **reduction of over 76% in the production of sludge** (see the box with further details).

THE ROMA EST PURIFIER AND THE ANAEROBIC DIGESTER ON THE SLUDGE LINE

The Roma Est purification plant is located on the left bank of the Aniene river, near Via Tiburtina, and collects the sewage from the densely populated areas of **Tiburtina, Casilina and Tuscolana**. It is **able to treat over 90 million m³/year of sewage**, equal to the purification requirement of over 900,000 equivalent inhabitants.

Like every urban effluent treatment plant, the Roma Est purifier, one of the largest among those managed by Acea Ato 2, operates according to an industrial process divided into two parts in design terms - the "water line" and the "sludge line". The latter underwent **major technological upgrading work** which involved its radical reconstruction.

The **"water line"** starts from the inlet point of the sewage into the plant and continues in the various purification compartments where the gradual removal of typical pollutants takes place, such as coarse solids, sand, oils and fats, suspended solids and finally dissolved solids. The result of this complex process is the production of purified water together with large quantities of semi-liquid waste, i.e. the sludge, made up of a mix of solid substances, with approximately 3% water. They are constantly removed from the "water line" and treated in the appropriate **"sludge line"**, where it is aimed to **reduce their quantity to a maximum** for financial and social and environmental reasons. The aim is achieved through two operations performed in sequence:

- **anaerobic digestion**, that is the gasification of a large part of the organic substances present in the sludge, thanks to the action of anaerobic bacteria in controlled conditions of acidity (pH > 6.5) and temperature (32°C<T<38°C), without air. In the time span of a few weeks the organic matter undergoes extreme decomposition which transforms it into biogas (60-70% methane, 25-30% carbon dioxide);
- the **subsequent dehydration**, first through centrifuging of the digested sludge (a product is obtained of which 25% is made up of solid substance and 75% water), then through evaporation by heating in appropriate **drying** ovens, until obtaining a material similar to soil which has a residual water content of around 20%.

The results achieved were considerable, with a **reduction in the production of sludge of over 76%** with respect to the preceding plant set-up, without anaerobic digestion and without final drying. There was a drop **from approximately 30,000 t/year of sludge** produced **to the current approximate 7,000 t/year**, with considerable advantages in environmental and economic terms;

- **reduction in transport** for final transport with consequent reduction in relative impact;
- fewer hygiene problems during movement of the sludge, thanks to its stabilisation;
- almost total **zeroing of the odour-causing emissions**.

As regards **the biogas** produced in the anaerobic digester, it is accumulated in large tanks which can contain 7,000 m³ of it, to be subsequently purified and then **used as fuel** in a boiler to produce the heat necessary to maintain the process of anaerobic digestion at the proper working temperature (approximately 35°C).

In the case of over-production compared to the plant needs, the biogas surplus is currently burnt in a flare and therefore a project is being studied, at Acea Elabori, to reduce to a maximum the imbalances between production of biogas and its beneficial uses.

THE USE OF ENERGY AND WATER

ENERGY EFFICIENCY ENHANCEMENT: APPROXIMATELY **7.1 GWh** OF SAVING/YEAR AND A **2,600 t** CO_2 EMISSION DROP IN ARETI WHEREAS APPROXIMATELY **2.3 GWh** OF SAVING/YEAR AND AN **800 t** CO_2 EMISSION DROP WAS OBSERVED IN ACEA ATO 2

APPROXIMATELY **475,000 GWh of electrical consumption** OF THE GROUP'S MEMBER COMPANIES FROM G.O. CERTIFIED **renewable energy**

MAJOR **leak detection campaign: 5,400 km** OF THE WATER DISTRIBUTION NETWORK ANALYSED IN ROME

ENERGY CONSUMPTION

ENERGY CONSUMPTION OF THE GROUP

The **direct energy consumption** of the main companies in the Group, which involves **the use of primary sources for the functioning of the production system, including consumption for the generation** of electrical and thermal energy (Table no. 58), and the **indirect energy consumption, which includes the losses** occurring in Rome's electricity distribution network and can be attributed to the phases of transformation and transport (Table no. 59), are illustrated below.

The **total consumption** of energy, **direct and indirect**, amounts to **approximately 11,975 TJ** (in 2016 equal to approximately 10,747 TJ). The increase is due **to the increase in direct consumption**, in particular in the Waste to Energy compartment. In 2017, in fact, line 1 of the San Vittore waste-to-energy plant was operational for 12 months while, in 2016, while still undergoing revamping, it was in action for only four months. The increase is in line with the increase in the production of energy by the same waste-to-energy plant (Table no. 58).

The **indirect** consumption, on the contrary, had a **slight decrease**, thanks above all to the lower consumption of public lighting due to the numerous replacements of traditional lamps with LED systems.

It should also be pointed out that, during the year, **the electricity consumption of the main companies**, and in particular consumption linked to waste management plants, the distribution of drinking and non-drinking water, purification and consumption for the work sites, **for a total of approximately 475,000 GWh, was certified as coming from renewable sources** (certification by means of the Guarantees of Origin - GOs) (Table no. 59).

The trends in the **indices of energy consumption intensity** are given in Table no. 60.

TABLE NO. 58 - DIRECT ENERGY CONSUMPTION OF THE MAIN COMPANIES IN THE GROUP (2015-2017)

	2015	2016	2017
ENERGY PER SOURCE		TJ (GWh)	
RDF/SSF and pulper (waste to energy)	2,766.8	3,198.9	3,638.2
- renewable share	(768.6)	(888.6)	(1,010.6)
biogas (100% renewable)	-	169.9	207.2
		(47.2)	(57.6)
RDF/SSF and pulper (waste to energy)	2,879.7	2,952.8	3,584.5
- non-renewable share	(799.9)	(820.2)	(995.7)
methane (for electricity generation, district heating,	577.5	566.2	732.0
water area dryers and heating for offices)	(160.4)	(157.3)	(203.3)
fuel oil	40.6	34.5	48.2
(for electricity generation and for heating offices)	(11.3)	(9.6)	(13.4)
petrol	9.1	4.9	2.9
(road haulage) (*)	(2.5)	(1.4)	(0.8)
diesel	42.8	61.6	97.2
(road haulage) (*)	(11.9)	(17.1)	(27.0)
LPG	0.8	0.8	0.8
(heating)	(0.2)	(0.2)	(0.2)
total	**6,317.4**	**6,989.6**	**8,311.0**
	(1,754.8)	**(1,941.6)**	**(2,308.6)**

(*) The 2017 road haulage data include Aquaser data not included in the years 2015-2016.

NB The energy produced by the Group plants and fed into the network is illustrated in the *Environmental Accounts* (Products - Energy Area). Approximately 12.5 GWh of energy produced by the Tor di Valle plant and consumed by the Roma Sud purifier from August 2017 should be subtracted (see *The New Tor di Valle Plant box*).

TABLE NO. 59 - INDIRECT ENERGY CONSUMPTION OF THE MAIN COMPANIES IN THE GROUP (2015-2017)

	2015	2016	2017
ENERGY PER SOURCE		TJ (GWh)	
electrical energy losses on the distribution networks and transport	1,341.8 (373.0)	1,283.8 (356.6)	1,244.9 (345.8)
losses and self-consumption in the production of electrical energy	198.0 (55.0)	200.0 (55.5)	221.6 (61.6)
losses of heat in the district heating network	28.8 (8.0)	86.4 (24.0)	72.5 (20.1)
consumption for public lighting	602.4 (167.3)	604.3 (167.8)	416.3 (115.6)
electrical consumption for waste management plants (*)	7.9 (2.2)	19.8 (5.5)	27.5 (7.7)
electricity consumption for distribution of drinking and non-drinking water (*)	797.4 (221.5)	846.0 (235.0)	1,001.7 (278.3)
electricity consumption for effluent purification (*) (**)	695.5 (193.2)	681.8 (189.4)	643.7 (178.8)
consumption of electrical energy for the offices (*)	36.7 (10.2)	35.6 (9.9)	36.1 (10.0)
total indirect energy consumption	**3,708.5 (1,030.4)**	**3,757.7 (1,043.8)**	**3,664.3 (1,017.9)**

(*) GO (Guarantee of Origin) certified energy

(**) Following adjustments, the 2015 and 2016 data were rectified.The 2017 item of data decreased due to various maintenance works at the Roma Est and Roma Sud purification plants of Acea Ato 2.

TABLE NO. 60 ENERGY INTENSITY INDICES (2015-2017)

ENERGY CONSUMPTION INTENSITY INDEX	u.m.	2015	2016	2017
electrical energy consumed for public lighting per lamp	TJ/lamp	0.0027	0.0027	0.0019
total electrical energy consumed by Acea Ato 2, Acea Ato 5 and Gesesa for water supplied (*)	TJ/Mm^3	3.8300	3.9005	4.2898
electrical energy consumed by Acea Ato 2, Acea Ato 5 and Gesesa for sewer service per km of sewer network	TJ/km	0.0204	0.0193	0.0163

(*) The trend in the increase in the consumption of electrical energy for water supplied depends mainly on an increase in energy consumption due to another very dry year.

ENERGY CONSUMPTION OUTSIDE OF THE GROUP

In 2015 Acea launched monitoring via specific questionnaires of the **energy consumption outside of the Group**, along the supply chain. In December 2017 the questionnaire was sent to around one hundred suppliers, the most representative in relation to the orders value for the year. Thanks to the results from 55 of those contacted (equal to 16% of the total Acea expenditure for the procurement of goods/services and works), their total energy consumption was estimated at approximately 273,349 GN[106].

ENERGY SAVING

In 2017 **Ecogena** retained the quality certification of ESCo (energy services company) pursuant to the standard UNI CEI 11352. It is therefore suitable for developing **initiatives of energy efficiency of the companies in the Group** and to report on the results to the Energy Services Operator (ESO) for **the obtaining of the energy efficiency titles** (EET).

The activities assigned to Ecogena include also the design and building of **trigeneration plants**[107] for the production, in combined mode, of **electrical, heat and cooling energy. In 2017 cogeneration plants were managed**, combined with **district heating networks for a total of 6.6 MW of electrical power**[108].
Total energy productions are in line with the previous year.
As is customary, the company applied for and obtained, also for 2017, the HEC (high-efficiency cogeneration) nomenclature for all the plants managed, achieving also issue of the EETs relating to 2016.
At **31.12.2017** the plants managed by Ecogena received **5,324 EETs** pursuant to Ministerial Decree of 5 September 2011.
In order to achieve the aim of energy saving, as regards Areti, actions concentrated on acquiring EETs on the market managed

[106] In 2016 it was possible to consider a more restricted scope (30 suppliers) for an estimate of consumption equal to 225,245 GN.

[107] Cogeneration, i.e. the combined production of electrical and thermal energy, allows high efficiencies to be achieved, between 80 and 90%. Trigeneration, which is a special application of cogeneration, allows use of a part of the thermal energy recovered in order to produce cooling energy in the form of cooled water for air conditioning in rooms or for industrial processes.

[108] The 6.6 MW includes 1 MW relating to management of the Prepo power plant, in the municipality of Perugia, not owned by Ecogena.

by the electricity market authority (EMA). The residual obligation relating to 2017 is equal to **109,418 EETs** with respect to the initial 111,460 EETs, to which the residual part of the 2016 obligation, equal to **97,169 EETs**, should be added. In November 2017 the residual relating to 2015, equal to 80,088 EETs, was annulled.
Finally it is pointed out that, during the year, Ecogena signed with Acea an Energy Performance Contract for the lighting efficiency project for the Piazzale Ostiense location.

TABLE N. 61 – ENERGY EFFICIENCY TITLES AND THE PRODUCTION OF ENERGY BY ECOGENA PLANTS (2015-2017)

	2015	2016	2017
ENERGY PRODUCED		TJ (GWh)	
electrical energy	61.6 (17.1)	64.8 (18.0)	60.8 (16.9)
thermal energy	66.2 (18.4)	77.0 (21.4)	83.2 (23.1)
cooling energy	3.2 (0.9)	14.8 (4.1)	14.8 (4.1)
EET		unit	
	1,170	1,203	1,039

ENERGY EFFICIENCY ACTIONS

Acea, during the year in question, carried out various schemes for the **recovery of energy efficiency in the processes managed**, in particular in the **companies in the water, energy infrastructure and environment areas**.
For the **water area**[109], despite the increase in consumption in absolute value (+5.6% compared to 2016), due to the improvement in the purification capacities of the systems managed and, above all, to dry weather conditions, which entailed the **use of standby pumping plants**, essential for integrated the gravity flow, with consequent worsening in energy consumption, **the companies improved, where possible, their own specific energy efficiency**.
In **Acea Ato 5** the increase in consumption, as mentioned, is to be correlated to the so-called "water crisis". We only have to consider that in the territory served the average rainfall in 2017 decreased by 51% compared to 2014-2015 and by 43% compared to 2016. In this situation some water systems, traditionally fed by gravity, are now fed from wells and energy has to be used in order to be able to feed the water resource into the distribution networks (for example in the Settefrati-Canneto and Anagni-Tufano systems). The lack of water also entails a lowering of the water levels for the systems fed ordinarily from wells, making pumping more difficult with a temporary functioning of the pumps "off the performance curve" and consequent lowering of the specific curve.
From the specific efficiency viewpoint, **Acea Ato 2** obtained in 2017 **energy savings for approximately 8.3 TJ/year**, compared to 2016, (with a saving of approximately 800 tonnes of emissions of CO_2), thanks to optimisation of **management of the pressures** (in the Eur, Montemario and Spinaceto water centres), associated with an achieved efficiency of approximately 0.7 TJ, recovery of water losses, associated with an estimated efficiency of approximately 7.2 TJ and the installation of lighting with LED on the outside yards (Torrenova, Casilino, Ottavia, Ostia, Eur) associated with an estimated efficiency of approximately 0.4 TJ.
Consumption by **Gesesa**, finally, increased in absolute value, due to the known climate clauses, which forced the company to increase use of the well fields for integrating the low availability of the water of the Campania region and also to the inclusion, in 2017, of the municipality of Tocco Caudio in the management of the service, which influenced the consumption of the Santo Stefano pumping station and the coming into operation of a new well field at S. Agata dei Goti.
As confirmation of their commitment towards energy efficiency and environmental sustainability, Acea Ato 2 and Acea Ato 5 have already obtained UNI EN ISO 50001 energy certification and Gesesa has already launched preparatory actions to obtain it.

For the **energy infrastructure** area, the company **Areti**, which manages electrical energy distribution, continued the **efficiency raising schemes** set up following the **energy diagnoses performed at some company locations**, as part of the UNI EN ISO 50001 energy management system and according to Legislative Decree no. 102/2014.
More particularly, one of the schemes of 2017 concerned modernisation of the outside public lighting system of the Casaletto primary station (PS), with a consequent saving of approximately 15 MWh.
Also important are **the works on the distribution network** aimed at energy saving. This involves, in particular, optimisation of the set-up of the MV network and gradual transformation of the voltage level from 8.4 to 20 kV and other adjustments for the HV and LV lines and the use of **167 MV/LV transformers with very low losses**. Table no. 62 shows the type of work and the relative energy savings of the last three years. These efficiency schemes led, **in 2017**, compared to 2016, to a **"reduction in emissions"** equal to approximately **2,600 t of CO_2**. Of these, approximately 720 tonnes relate to a (non-quantitative) legal obligation. The remaining reductions correspond to voluntary interventions.

Finally, for the **Environment** area, the installation of modern conveyor belts for the heavy ash at the San Vittore plant in Lazio involved recovery of energy from the heat of the heavy ash and will involve, at normal capacity, also the reduction in the consumption of electrical energy of the plant (see the box *New conveyor belts at San Vittore* in the paragraph *Waste to Energy*).

[109] The water companies within the scope are considered: Acea Ato 2, Acea Ato 5 and Gesesa.

TABLE NO. 62 – ENERGY EFFICIENCY IN ARETI (2015-2017)

ENERGY SAVING OBTAINED

action	u.m.	2015	2016	2017
reduction in losses on the network	GJ	15,314	29,365 (*)	24,959 (**)
reduction in losses through the purchase of new transformers	GJ	25	474	662
thermal power plant revamping	GJ	18	61	61
renovation of inside lighting system in one of the locations	GJ	-	5	5
renovation of outside lighting system at CP Casaletto	GJ	-	-	54

(*) Value rectified with respect to the one published after an analytical study of the network.

(**) Value estimated from theoretical valuations while awaiting the network analytical study.

NB Each saving is referred to the previous year with respect to the year of reporting. Almost all involve reductions in electrical energy.

SUSTAINABLE MANAGEMENT OF THE WATER RESOURCE

The **water consumption of the Group**, illustrated in Table no. 63, refers both to **industrial processes** and uses for district heating and **civil uses**. The decrease for civil uses, recorded from 2017, is due mainly to an investigation carried out in Acea Ato 2 which led to a partial review of utilities and attributions of consumption. Specifically, it led to the estimate of approximately 800,000 cubic metres to be attributed to the consumption of drinking water for processes (and not for civil use). This indicates therefore greater focus on the accounting of the actual consumption.

TABLE NO. 63 - WATER CONSUMPTION OF THE MAIN COMPANIES IN THE GROUP (2015-2017)

	2015	2016	2017
		(Mm^3)	
industrial processes: district heating and others for thermal electricity generation (*), Acea Ambiente plants; water companies (source: water system, wells, river, rainfall)	0.12	0.14	0.95
of which rainfall			*0.003*
of which river water		*0.003*	*0.003*
of which recovered wate			*0.002*
civil/sanitary use (**) (source: water system)	2.04	2.12	1.44
total water consumption	**2.16**	**2.26**	**2.39**

(*) They include: the process water used at the Tor di Valle Thermoelectric Plant and the water used at the plants of Acea Ambiente coming mainly from the water system.

(**) The companies and the plants to which the item of data refers are: Acea SpA, Areti, Acea Produzione, Acea Elabori, Acea Ato 2, Acea Ato 5, the waste management plant of Orvieto and the waste-to-energy plants.

Projects aimed at recovering process effluent, to reuse it for industrial applications, have been implemented or are being completed at some plants. In particular, **at the Aprilia composting plant**, the plan was completed for treatment of effluent which can be reused in the industrial cycle, which in 2017 led to the **reuse of approximately 800 cubic metres of water**. At the **San Vittore waste-to-energy plant of Lazio** the rainwater is reused in the process of production of demi water after treatment in a special chemical and physics plant and **came into operation in January 2017**. Thanks to the presence of this technology the volumes of water discharged into a body of water were zero throughout 2017, while **the volumes of water recovered** were equal to **1,089 cubic metres**.

In **Acea Ato 2 a project was launched** for reuse of the water purified directly inside the purification plants. In particular for the preparation of a specific additive, cationic polyelectrolite, used in the process of dehydrating sludge. At normal capacity it should allow industrial use of some hundreds of thousands of cubic metres a year of purified water otherwise destined to be discharged into surface bodies of water.

At the Orvieto installations centre a system is in operation for collection of rainfall coming from the roof of the treatment system building to top up the fire-fighting reserve.

WATER LOSSES

Sustainable management of the water resource also includes the issue of **containment of losses on the distribution networks**, with awareness of the difficulties which this activity involves and the huge resources necessary. 2017 management saw Acea Ato 2 carry out the work to identify losses with a targeted campaign, in order to recover the resource and tackle the summer emergency (see box *Plan for Recovery of Losses in Rome and in the Municipalities of Ato 2*).

PLAN FOR RECOVERY OF LOSSES IN ROME AND IN THE MUNICIPALITIES OF ATO 2

In 2017 systematic campaigns were carried out to identify hidden loses both in Rome and in the municipalities of Ato 2. In Rome the **losses identification campaigns** were carried out **on the 5,400 km of distribution network**, with the aim of tackling the water emergency underway and recover resource.
The emergency action plan foresaw the division of the city of Rome into four areas on which campaigns were carried out to identify points of the network where there were invisible losses. The activity was developed using operations teams at locations in the territory, **supplied with cutting-edge instruments** and a team of experts for processing data and for targeting the repair work. At 31 December a complete campaign was performed for identifying losses over 5,400 km and a further "rerun" of fine tuning on a significant portion of 4,200 km of network, detecting a total of 2,093 losses.
In conjunction with the work for identifying losses and for contributing to the reduction in the input, work was defined to make various areas efficient through schemes or reconfigurations of network layouts, through a check on the perimeter definition of the water districts and optimisation of pressures. During the year **2,700 km of distribution network in Rome were studied**, and **25 measurement districts created**, corresponding to 1,600 km of distribution network, for the control of which **14 new flow meters and 90 pressure gauges** were installed, released for remote management.
The work to increase network efficiency was also carried out on **20 municipalities of Ato 2**. The study focused on 1,000 km of network and structured into work of surveying, flow and pressure measurements, mapping, analysis of utilities and water report, mathematical modelling and specific work to identify losses.

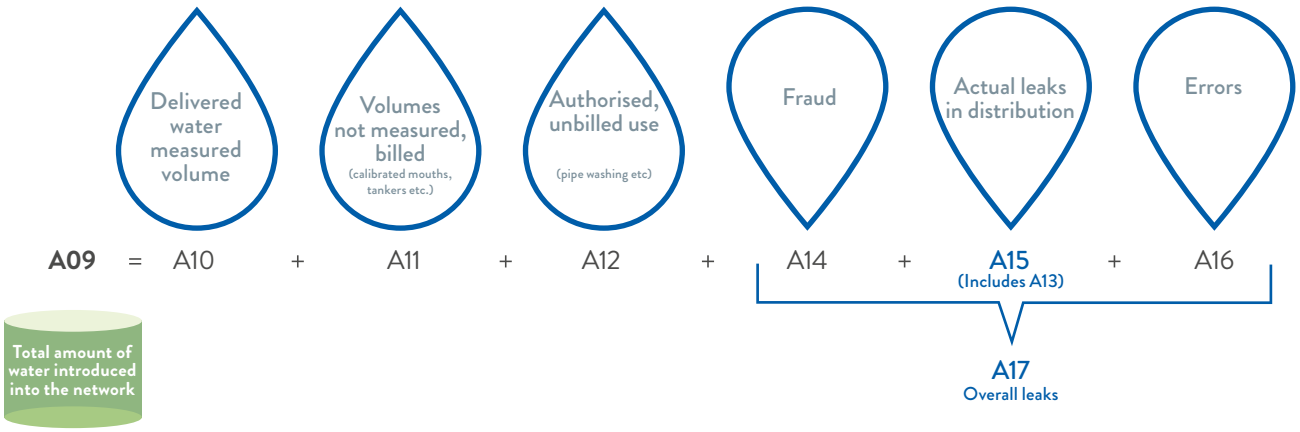
THE 2017 WATER EMERGENCY IN ITALY

The meteorologists at the Centro Epson Meteo calculated that in 2017 **20 billion cubic metres of water were lost** in Italy during the spring months, a volume equal to that of the entire Lake Como (which covers 146 km2, with maximum depth of 425 metres), and **equal to almost 50% of the "reserve capacity" present throughout Italy**. A water emergency which in the summer months involved the whole of the country, from north to south, with orders to reduce the flow rate of intakes from surface sources (lakes and waterways) to ensure as a priority the water needs for drinking water use and therefore also the safeguarding of bodies of water from the ecological and environmental standpoint. An emergency which is documented daily by municipal orders for a ban on the use of water for non-essential purposes (hygiene and domestic) and for a responsible use, dictated by common sense and saving. **In the more critical cases rationing was even organised**, as in the western area of Salerno, at Iglesias, Sassari and neighbouring municipalities, with suspension of the water supply during the night. A situation which also concerned 20 municipalities in the province of Rome, with water supply rotations.
Source: Acqua no. 86 (ref. research laboratory).

In 2017 Acea Ato 5 carried out the analysis of the layouts of the water networks and the work of **identification and recovery of losses**, with approximately **1,932 interventions**, in particular at Sora, Fiuggi, Ceccano and part of Frosinone. **Pilot studies were also completed at the municipality of Sora and Fiuggi**, which allowed the recovery of approximately **35 l/s** and improved the layout of the networks, and a **similar study is being completed in the municipalities of Ceccano and Frosinone**.
Gesesa worked on extending the process of dividing into districts the water networks and the reduction in pressures in eight municipalities acquired in 2015. In 2017 the analysis of the layouts of the water networks and the work on **identification and recovery of losses** involved **295 interventions** and the **repair of approximately 2.8 km** of water network.

As regards the issue of water losses, in order to make the data from different operators comparable and define the quantities that contribute to estimating them, Ministerial Decree no. 99/97 supplies a reference model. In recent years **ARERA** has intervened with a series of measures which have introduced progressive new ideas in the calculation process. The water balance data, illustrated in detail in the ***Environmental Accounts***[110], were processed, ensuring the comparability of the last three years.
Chart no. 48 illustrates **the model indicated in Ministerial Decree no. 99/97**, considering the new features of the regulation of ARERA.

CHART NO. 48 – REAL WATER LOSSES (MODEL OF MINISTERIAL DECREE NO. 99/97, REGULATORY INTEGRATIONS OF ARERA)



[110] The water reports of the companies of Campania, Umbria and Tuscany, with consolidated net worth, can be examined in the chapter *Water Companies and Foreign Activities Prospectuses*.

As already indicated, following in-house input from the new management and outside input due to the water emergency, Acea performed numerous and extensive **interventions to identify and repair losses, above all in the area of Rome**. These interventions meant a **reduction in the losses** which, in percentage terms and according to the calculation method 2016 of ARERA, are based on the entire Ato 2, for 2017, at the value of **45.5%**, given the 2016 value of 48.1%. For **Rome** the result is even more sensitive, having dropped from the value of 45% in 2016 to the value of **41.3% in 2017**. This extraordinary result is even more evident if examined only in relation to the second half of the year in which the average percentage of the losses was 38.8%, with minimum peaks of 37.6%, lower by approximately a percentage point compared to the national average of 38.3% (source ISTAT - year 2015). The strong **downturn in losses**, if evaluated in relation to the input in the Rome network alone, has a produced a reduction in the same in the second half of 2017 equal to 11% on average (-1,800 ls/s over 16,300 l/s) with peaks of **-14% (-2,300 l/s in the autumn of 2017)**. In **Acea Ato 5** (Frosinone) the real losses for 2017 were found to be equal to 65% approximately of the input in the network. Finally, in **Gesesa** they were found to be equal to approximately 44%. See the *Environmental Accounts* for details.

EMISSIONS

CONSTANT SAMPLING AND ANALYSIS ON THE EMISSIONS OF THE INCINERATORS THROUGH SME CABINETS

EMISSIONS INTENSITY INDEX (SCOPE 2) FROM NETWORK LEAKS OUT OF THE TOTAL DISTRIBUTED ELECTRICAL POWER IMPROVED:

0.0115 t/MWh

AIR EMISSIONS

The **monitoring of air emissions from Acea plants**, particularly **the waste-to-energy plants**, is carried out using EMS (Emissions Monitoring System) cabins which continuously sample and analyse the fumes coming out of the chimneys, returning the measurement of numerous parameters, periodically checked by internal staff and certified by qualified external laboratories. A highly satisfactory scenario emerged for 2017 too, with **values of main pollutants well below the limits laid down by the law** (see Table no. 64); in any case the **principle of precaution** still applies, as well as attention and seeking out technological solutions with increasing performance from the issue quality viewpoint.
The waste-to-energy plants are also managed according to UNI EN ISO 14001 standards and the European EMAS scheme.

TABLE NO. 64 - AIR EMISSIONS FROM THE SAN VITTORE DEL LAZIO AND TERNI WASTE-TO-ENERGY PLANTS (2015-2017)

		San Vittore del Lazio plant (*)				Terni plant (*)			
pollutant	**u. m.**	**reference parameter (**)**	**2015**	**2016**	**2017**	**reference parameter (**)**	**2015**	**2016**	**2017**
HCl	mg/Nm^3	8	0.185	0.069	0.053	10	3.840	4.221	4.002
NO_x	mg/Nm^3	70	22.105	16.440	18.089	200	139.480	134.445	134.274
SO_2	mg/Nm^3	40	0.035	0.032	0.014	50	0.170	0.297	0.490
HF	mg/Nm^3	1	0.030	0.010	0.011	1	0.220	0.924	0.122
CO	mg/Nm^3	40	1.200	1.065	1.447	25	1.370	0.108	1.018
total dusts (particulate)	mg/Nm^3	3	0.020	0.004	0.006	5	0.350	0.753	0.678
PAH (polycyclic aromatic hydrocarbons)	mg/Nm^3	0.01	0.00003	0.00001	0.00001	0.01	0.00005	<0.001	0.0001
Dioxins and furans (PCDD +PCDF)	mg/Nm^3	0.1	0.0010	0.0044	0.0047	0.1	0.0166	<0.01	0.0173

		San Vittore del Lazio plant (*)				Terni plant (*)			
pollutant	u. m.	reference parameter (**)	2015	2016	2017	reference parameter (**)	2015	2016	2017
Heavy metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V)	mg /mg/ Nm^3	0.5	0.0418	0.0193	0.0262	0.5	0.0501	0.0263	0.1085

(*) The analysis of PAH, dioxins and furans and heavy metals and their composites are four-monthly and discontinuous. The "<" symbol identifies the concentration values that are equal to or below the thresholds that the devices used by the laboratory are capable of measuring.

(**) Reference parameters, Legislative Decree no. 46/2014, 2000/76/EC and AIA, are separate for each waste-to-energy plant.

NB The figures for the San Vittore plant refer to the arithmetic averages on the two operating lines for the two-year period 2015-2016 and three lines for 2017.

Like every year, measures were taken in 2017 at the San Vittore del Lazio waste-to-energy plant to **monitor air quality in the points of greatest accumulation of pollutants emitted by the stacks**. Furthermore, periodic monitoring of the **quality of the terrain and water of the aquifers** surrounding the plant is carried out. In particular, studies were performed on the bioaccumulation of heavy metals in the lichen matrix present in the soils surrounding the plant. In 2017, at the two permanent control boards 4 monitoring campaigns were carried out lasting 15 days each in order to define the heavy metals. The results of **all the monitoring campaigns**, using both fixed and mobile monitoring devices, **did not indicate excessive levels** for the measured parameters.

GREENHOUSE GAS EMISSIONS

According to the international document Greenhouse Gas Protocol (or GHG Protocol), aligned **with the ISO 14064** standards, greenhouse gas emissions are divided up into:

- ***Scope 1* emissions:** direct greenhouse gas emissions;
- ***Scope 2* emissions:** indirect greenhouse gas emissions;
- ***Scope 3* emissions:** other indirect greenhouse gas emissions.

For over ten years Acea has quantified its CO_2 emissions by **evaluating the carbon footprint of the single production macro processes** according to the guidelines set out in the *GHG Protocol* (www.ghgprotocol.org); in fact, it takes part in the CDP (see dedicated box in paragraph *Mitigation and adaptation to climate change*).

Scope 1 greenhouse gas emissions are direct emissions originating from the Group's thermoelectric plants, waste-to-energy plants and include those deriving from the heating process, dryers, motor vehicles in the fleet (with reference to petrol and diesel vehicles) and, lastly, sulphur hexafluoride (SF_6) leaks that may occur from Areti's plants. The greatest contribution comes from the CO_2 emitted by the waste-to-energy plants, which was further increased in 2016 as a result of the fully operational line 1 in San Vittore in the 12 months. By importance, this is followed by the contribution deriving from the Acea Produzione plants which has been more or less constant for the past three years (see Table no. 67 for details).

Scope 2 greenhouse gas emissions are indirect, deriving from the consumption of electricity and also kept under control.

In both cases, they concern emissions which Acea monitors regularly, also disclosing them, as mentioned, by means of the *CDP* (see Table no. 67).

Other details of Carbon Footprint – Scope 2 in the water Area, can be found in the *Environmental Accounts*.

Scope 3 greenhouse gas emissions are represented by **other indirect emissions**: they include emissions deriving from the purchase of goods/services and work, employees travelling for business purposes and employees commuting to and from work.

For the third year running, Acea has monitored its suppliers with a view to heightening their awareness on the topic of possible environmental impacts deriving from the activities carried out (see hereunder, Table no. 67).

Three Group plants, specifically the waste-to-energy plant in Terni and the thermoelectric plants in Montemartini and Tor di Valle, are subject to the Emission Trading Scheme (ETS). The allowances assigned under the NAP (National Allocation Plan) framework, in respect of the actual emissions registered in the three-year period 2015-2017, are shown in Table no. 65.

TABLE NO. 65 – CO_2 EMISSION ALLOWANCES AS PER THE NATIONAL ALLOCATION PLAN (NAP) AND ACTUAL EMISSIONS BY PLANT (2015-2017)

	2015		2016		2017	
plant	t					
	assigned by the NAP	effective	assigned by the NAP	effective	assigned by the NAP	effective
Tor di Valle (*)	9,105	23,466	7,969	23,313	6,869	33,507
Montemartini	0	1,971	0	1,297	0	2,278
Terni waste-to-energy plant (**)	0	120,286	0	112,865	0	113,117

(*) As with previous years, in 2017 the applicable legislative framework allowed the Tor di Valle plant to benefit from free of charge emission allowances (6,869 t) as it serves a remote heating network.

(**) Includes emissions of biogenic CO_2 (equal to 47,684 t for 2017).

INTENSITY INDICES FOR GREENHOUSE GAS EMISSIONS

One of the monitored intensity indices for greenhouse gas emissions (see Table no. 67) concerns ***Scope 2* carbon dioxide emissions, deriving from leaks in the network** for the distribution of electricity, **in respect to the total electricity distributed**. This index has improved further, changing from 0.0119 t/MWh in 2016 to **0.0115 t/MWh** in 2017, in line with the continuous decrease in relative leaks in the network (technical leaks/distributed electricity).

With regard to the other atmospheric emissions, especially the more significant macro-pollutants due to the main production processes of the plants, see the data summarised in Table no. 66.

TABLE NO. 66 - TOTAL EMISSIONS OF ATMOSPHERIC POLLUTANTS FROM ACEA GROUP PLANTS (2015-2017)

emissions	2015	2016	2017
		(t)	
CO	6.75	6.28	6.81
NO_x	190.86	171.13	198.20
SO_x	0.22	0.28	0.42
dusts (particulate)	0.32	0.55	0.55

NB The emissions refer to the following companies: Acea Ambiente – waste-to-energy plant and Acea Produzione.

Monitoring carried out on all the plants at risk[111] demonstrated **the absence of emissions of significant quantities of substances responsible for reducing the ozone layer** (see the *Environmental Accounts - Resources used, for consumption*).

GROUP VEHICLE FLEET: CONSUMPTION AND IMPACT

Consistently with the commitment to cut atmospheric emissions, Acea focuses on the **renewal of the Group vehicle fleet**. However, in 2017, the new system introduced for managing in field intervention processes (Workforce Management), now fully operational, gave rise to an increase in fuel consumption, regardless of more efficient interventions, also due to the higher number of vehicles contemporarily in circulation and the longer routed travelled. The total number of Group vehicles in 2017, including Aquaser and Acea Ambiente, is equal to **about 2,600 means**.

The date regarding CO_2 air emissions for the vehicle fleet, illustrated in Table no. 67, reflect the choice made some years ago to use a fleet of mainly diesel powered vehicles: the **increase in emissions** of carbon dioxide substantially depends both on the mentioned increase in **fuel consumption** and the inclusion of Acea Ambiente and Acquaser vehicles into the boundary (see Table no. 67 and the *Environmental Accounts* for punctual data on consumption and emissions).

TABLE NO. 67 - ENVIRONMENTAL INDICATORS: CO_2 EMISSIONS, INTENSITY INDICES OF THE GREENHOUSE GAS EMISSIONS AND VEHICLE FLEET EMISSIONS (2015-2017)

CO_2 EMISSIONS				
SCOPE 1 EMISSIONS				
FROM ENERGY PRODUCTION PLANTS				
	u. m.	**2015**	**2016**	**2017**
CO_2 emissions from Acea Produzione thermoelectric plants	t	25,440	24,610	33,507
CO_2 emissions from Acea Ambiente waste-to-energy plants	t	220,286	232,865	321,939
FROM WASTE MANAGEMENT, ENERGY DISTRIBUTION, HEATING PLANTS AND VEHICLE FLEET				
CO_2 emissions from waste management plants	t	-	-	932
CO_2 emissions from dryers water plants	t	-	-	2,026
CO_2 emissions from remote heating	t	1,644	1,018	1,008
CO_2 emissions from vehicle fleet (*)	t	3,816	4,891	7,371
CO_2 emissions from Areti plants (SF_6) (**)	t	12,540	14,820	14,100

[111] This is primarily air conditioning equipment using refrigerant gases subject to the 1987 Montreal protocol, particularly chlorofluorocarbons.

TOTAL SCOPE 1 EMISSIONS	t	263,726	278,204	380,883
SCOPE 2 EMISSIONS				
CO_2 emissions from location based consumption of electricity consumption (market based) (***)	t	357,979 (n.a.)	349,718 (422,576)	328,921 (170,051)
SCOPE 3 EMISSIONS				
CO_2 emissions deriving from the purchase of goods/services and works (****)	t	15,464	17,099	20,349
CO_2 emissions from commuting	t	3,800	3,687	3,286
CO_2 emissions from business travel	t	166	197	152
INTENSITY INDICES OF GREENHOUSE GAS EMISSIONS				
intensity indices of the GHG emissions	**u. m.**	**2015**	**2016**	**2017**
CO_2 emissions (Scope 1 + Scope 2)/Acea Group added value	(t/k€)	0.728	0.627	0.677
Scope 1 CO_2 emissions/gross production (*****)	(g/kWh)	324.0	357.2	434.2
Scope 2 CO_2 emissions deriving from losses on the electrical energy distribution network/distributed GWh (******)	(t/MWh)	0.0123	0.0119	0.0115

(*) The value for 2017 underwent a strong increase, mainly due to the inclusion of Acea Ambiente and Aqaser into the scope.

(**) These are the tonnes of equivalent CO_2 corresponding to the emissions of insulating SF_6 present in Areti's HV equipment (1 t di SF_6 equates to 23,500 t of CO_2, GHG Protocol-5th Assessment Report- AR5): 0.60 tonnes in 2017 (0.60x23,500=14,100 t). The value for 2017 cannot therefore be compared to that for the previous years when factor 22,800 of the 4th Assessment Report- AR4 was used.

(***) The indirect emissions (scope 2) include the companies within the scope of the consolidated Non-Financial Statement: Acea Ambiente, Acquaser, Acea Produzione, Areti, Acea SpA and the water companies Acea Ato 2, Acea Ato 5 and Gesesa. The value of 0.36 is used as the emission factor per unit of electrical energy consumed (t CO_2/MWh), calculated adopting the primary energy data of the MISE 2013 energy balance and CO_2 emission factors per single source established by means of EU Decision 2007/589/EC. As from 2016 Score 2 type emissions datum was also calculated using the Market Based method. The Residual Mixes coefficients are, for 2016 and 2017 are 0.435 t/MWh and 0.465 t/MWh respectively.
Considering the whole Group and so also including the other water companies, Gori, Umbra Acque, Acquedotto del Fiora, Publiacqua, Acque, for the sole proprietary quota part of Acea, for the three-year period 2015-2017, di Location based CO_2 emissions are equal to 420,490 t, 409,128 t and 394,660 t respectively, whereas for the Market based emissions, calculated for the two-year period 2016-2017 they are equal to 494,363 t and 235,790 t.

(****) This value, estimated, refers to suppliers of goods, services and works and includes transport emissions.

(*****) Scope 1 emissions in this index exclude emissions deriving from SF_6 leakage in Areti plants. The 2017 figures also exclude the amount of emissions referring to water area dryers and the compost plants, so that the datum is consistent with previous years. The value for 2016 differs from that published for data consolidation. The notable increase of 2017 mainly depends on perfecting the calculus methodology for the San Vittore emissions, which was only used in 2017.

(******) Network leakage considered for Score 2 emissions and for calculating the indicator regarding the three-year period 2015-2017, are as follows: 138,017 t, 128,388 t and 124,479 t (due to the technical leakage of electricity from the network).

NB The emission factors for Scope 1 emissions are taken from the standard parameters-ISPRA 2015 data.

WATER COMPANY DATA SHEETS AND OVERSEAS ACTIVITIES

The first part of the chapter explains the activities, information and environmental accounts data outside of the *Consolidated Non-Financial Statement* regarding the main companies of the Group which operate in the water segment in Campania, Umbria and Tuscany, consolidated using the equity method in the statutory Sustainability Report. The second part describes the activities of the operating companies abroad.

WATER ACTIVITIES IN CAMPANIA, UMBRIA AND TUSCANY

In 2017, for water balance reporting and, in particular, for the calculation of water losses, the companies followed the criteria set out by the ARERA, as well Ministerial Decree no. 99/97, for the three-year period, unless otherwise specified.

GORI

Gori SpA manages the integrated water service in Campania, in the area covered by Optimum Area of Operations 3 - Sarnese Vesuviano.
It is a joint-stock company with a predominantly public-owned share capital, where the private minority shareholder (which holds 37.05% of the share capital) was identified given its technical-industrial and management abilities: it is Sarnese Vesuviano Srl, 99.16% of whose share capital is owned by Acea SpA. Ato 3 – Sarnese Vesuviano comprises 76 Municipalities (59 in the province of Naples and 17 in the province of Salerno), fully acquired under management as of 31/12/2009. The area served has around 1,460,000 inhabitants, with over 500,000 customers; the water network and sewerage network cover more than 4,300 km and 2,300 km, respectively.

HUMAN RESOURCES IN FIGURES

GORI SPA EMPLOYEES: BREAKDOWN OF HUMAN RESOURCES (2016-2017)

(no.)	2016				2017			
	men	women	**total**	weight %	men	women	**total**	weight %
executives	6	2	**8**	1	6	2	**8**	1
managers	17	1	**18**	3	17	1	**18**	3
white-collar workers	302	61	**363**	55	299	60	**359**	55
blue-collar workers	269	0	**269**	41	263	0	**263**	41
total	**594**	**64**	**658**	**100**	**585**	**63**	**648**	**100**

GORI SPA EMPLOYEES: CONTRACT TYPE (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
permanent workforce (open-ended contracts)	594	64	**658**	585	63	**648**
(of which) part-time staff	*0*	*1*	***1***	*0*	*1*	***1***
staff with fixed-term contracts	0	0	**0**	0	0	**0**
staff with professional apprenticeship contracts	0	0	**0**	0	0	**0**
total	**594**	**64**	**658**	**585**	**63**	**648**

INDUSTRIAL ACCIDENTS AND FREQUENCY AND SEVERITY INDICES (2016-2017)

	2016	2017
accidents (no.)	23	33
total days of absence (*)	484	241
hours worked	1,089,276	1,023,504
index of frequency (fi) (no. accidents x 1,000,000/work hours)	**21.11**	**32.42**
index of seriousness (si) (days absence x 1,000/work hours)	**0.44**	**0.23**

(*) The value also includes the days of absence due to the continuing or returning effects of accidents occurring in previous years.

TRAINING COURSES AND COSTS IN GORI SPA (2016-2017)

type of course	courses (no.)		editions (no.)		training (hours)		costs (Euros)	
	2016	2017	2016	2017	2016	2017	2016	2017
human resource management (*)	1	0	1	0	192	0	0	0
IT	46	25	123	42	16,931	3,462	307,100	76,612.63
induction of new recruits (*)	0	0	0	0	0	0	0	0
environmental	0	3	0	5	0	1,508	0	24,980
technical-specialist	23	13	50	20	1,568	850	5,195	3,607.5
managerial/role	2	2	3	8	484	358	16,160	12,919.25
administrative-managerial	0	0	0	0	0	0	0	0
safety	17	13	39	49	1,706	5,270	46,819	18,493.23
legal	9	3	10	12	77	1,596	3,285	3,300
experiential	1	2	2	5	1,615	5,233	28,800	108,740
total	**99**	**61**	**228**	**141**	**22,573**	**18,277**	**407,359**	**248,653**

(*) The training may be carried out by teaching staff within the Group.

TRAINED EMPLOYEES (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
	592	56	**648**	565	57	**622**

NETWORK AND PLANT CONSISTENCY AND ENVIRONMENTAL DATA

WATER SYSTEM MANAGED BY GORI SPA (active plants) (2015-2017)

	2015	2016	2017
water network (km)	4,398	4,501.50	4,500.38
aqueducts and transport networks (km)	*359*	*452.96*	*455.89*
distribution network (km)	*4,039*	*4,048.55*	*4,044.49*
well intake structures (no.) (*)	60	75	76
spring intake structures (no.)	4	4	4
lifting stations (no.) (**)	98	98	95
reservoirs (no.) (***)	162	163	164

(*) The Sala well has been added.
(**) The water lifting plants of San Michele, Forma and Via Monte Vescovado have been eliminated.
(***) The Corbara reservoir was added.

CONSISTENCY OF THE PURIFICATION AND SEWERAGE PLANTS MANAGED BY GORI SPA (2015-2017)

	2015	2016	2017
purification plants (no.)	7	7	7
sewerage lifting systems (no.) (*)	161	165	169
sewerage network (km) (**)	2,319	2,333	2,413

(*) Added sewerage lifting systems: via Marittima, via Achille Consiglio, via Semmola, via Li Dottori, via Scafati, via Achille Grandi; subtracted: Lava Troia, Lido del Sole.
(**) About 33 km of collection network laid as new and the mast of additional km of network modified; the north eastern district collector was taken under management (about 12 km); all data for defining the managed network were reviewed.

CERTIFICATIONS

Since 2015, the company has adopted a management system for health and safety in the workplace certified according to BS **OHSAS 18001:07.**

GORI SPA ENVIRONMENTAL ACCOUNTS (2015-2017)

PRODUCTS AND ANALYTICAL TESTS	u. m.	2015	2016	2017	Δ% 2017/2016
DRINKING WATER					
drinking water from the environment	**Mm³**	**39.94**	**44.41**	**70.98**	**59.8**
from wells	*Mm³*	*36.94*	*41.45*	*69.10 (*)*	*66.7*
from springs	*Mm³*	*3.00*	*2.96*	*1.87*	*-36.8*
water from other aqueduct systems	**Mm³**	**166.75**	**158.20**	**126.20**	**-20.2**
drinking water introduced into the network	**Mm³**	**206.69**	**202.62**	**197.18**	**-2.7**
total drinking water supplied	**Mm³**	**90.37**	**90.37**	**89.97**	**-0.4**
ASSESSMENT OF LEAKAGE ACCORDING TO MINISTERIAL DECREE NO. 99/97 ALSO IN COMPLIANCE WITH ARERA REQUIREMENTS					
overall leakage (parameter A17)	**Mm³**	**115.87**	**111.80**	**107.21**	**-4.1**
actual leakage (parameter A15 of Ministerial Decree 99/97)	**Mm³**	**91.83**	**87.76**	**83.17**	**-5.2**
TREATED WASTEWATER					
water treated in the main treatment plants	**Mm³**	**8.7**	**8.2**	**9.0**	**10.3**
ANALYTICAL TESTS ON DRINKING WATER AND WASTEWATER					
no. analytical tests on drinking water	**n.**	**80,544**	**81,590**	**101,460**	**24.4**
no. analytical tests on drinking water (**)	**n.**	**19,204**	**19,454**	**19,180**	**-1.4**

(*) Increase also due to a greater use of internal sources due to a lower contribution from the local community of Campania.

(**) The value includes determinations completed on sewerage network and purification plant wastewater.

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
COLLECTION, TRANSPORTATION AND DISTRIBUTION OF DRINKING AND NON-DRINKING WATER					
materials					
sodium hypochlorite	t	164.4	401.91	196.9	-51.0
ELECTRICITY					
Total electricity for drinking water	**GWh**	**50.86**	**52.38**	**71.63**	**36.8**
electricity for water lifting stations	*GWh*	*50.44*	*52.14*	*71.46*	*37.1*
electricity for offices	*GWh*	*0.42*	*0.24*	*0.17*	*-29.2*
WASTEWATER PURIFICATION					
materials					
polyelectrolyte powder	t	25.8	30.7	**19.0**	-38.1
polyelectrolyte emulsion	t	20.3	33.1	**34.0**	2.7
sodium hypochlorite	t	146.2	172.2	**152.0**	-11.7
ferric chloride aiding flocculation (40%)	t	69.5	129.0	**122.0**	-5.4
citric acid	t	1	1.2	**4.0**	233.3
peracetic acid, polyamine/anti-foaming agent	t	71.4	96.2	**81.0**	-15.8
polyaluminium chloride (PAC)	t	5.4	4.1	**4.0**	-2.4
mineral oil and fats	t	1.4	6.4	**6.0**	-6.3
other (artificial cod + soda for deodorisation)	t	2.5	2.2	**3.1**	40.9
ELECTRICITY FOR WASTEWATER					
Total electricity for wastewater	**GWh**	**15.42**	**14.76**	**14.00**	-5.1
electricity for purification	*GWh*	*10.63*	*10.15*	*9.02*	*-11.2*
electricity for lifting stations	*GWh*	*4.79*	*4.61*	*4.99*	*8.2*

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
OTHER CONSUMPTION (*)					
Other drinking water consumption	**m^3**	**7,266**	**7,797**	**7,282**	**-6.6**
drinking water consumed for non-industrial water uses (the data relate to consumption for offices, outside showers, etc.)	*m^3*	*7,266*	*7,797*	*7,282*	*-6.61%*
drinking water consumed for process water uses (washing machinery and bays, etc.)	*m^3*	*0*	*0*	*0*	-

(*) The data related to other consumption are estimated. The value related to process water usage is null given that industrial water is used.

WASTE	u. m.	2015	2016	2017	Δ% 2017/2016
SPECIFIC WASTE FROM WASTEWATER PURIFICATION					
treatment sludge	t	12,286	12,526	6,318 (*)	-49.6
sand and sediment from treatment	t	2,361	2,382	2,187	-8.2
WASTE PURSUANT TO LEGISLATIVE DECREE NO. 152/06 EXCLUDING SLUDGE AND SAND (**)					
hazardous waste	t	0.061	0.067	0.058	-13.4
non-hazardous waste	t	0.00	5.20	10.0	92.3

(*) The reduced production of sludge is due to the activation of the dryer at the Scafati purification plant which allowed a notably reduction in the humidity fraction of dehydrated sludge.

(**) As in previous years, the variability in quantities of hazardous and non-hazardous waste derives from purification processes - excluding sludge, sediment and sand - these are associated to extraneous factors, and therefore can be highly variable.

TOTAL COD IN INPUT AND OUTPUT (2015-2017)

(t/year)	2015	2016	2017
COD_{out}	183	158	213
COD_{in}	3,379	2,772	3,239

OUTPUT PARAMETERS FOR THE MAIN TREATMENT PLANTS MANAGED BY GORI SPA (2015-2017)

parameter	average of values (mg/l) 2015	average of values (mg/l) 2016	average of values (mg/l) 2017
BOD_5	9.4	8.9	9
COD	27	19.5	24
SST	15	20.3	23
NH_4^+	1.5	1.4	1
fosforo	1.0	0.8	1

TREATMENT EFFICIENCY OF THE MAIN TREATMENT PLANTS MANAGED BY GORI SPA (2015-2017)

parameter	average of values (%) 2015	average of values (%) 2016	average of values (%) 2017
$100x(COD_{in} - COD_{out})/COD_{in}$	91	94	**93**
$100x(SST_{in} - SST_{out})/SST_{in}$	96	84	**84**
$100x(NH_{4\,in}^{+} - NH_{4\,out}^{+})/ NH_{4\,in}^{+}$	88	97	**97**
$100x(PO_{4\,in}^{-3} - PO_{4\,out}^{-3})/ PO_{4\,in}^{-3}$	71	69	**53**

EFFICIENCY

During the three-year period 2015-2017, Gori has implemented energy efficiency interventions and achieved the savings shown in the table.

GORI SPA ENERGY EFFICIENCY (2015-2017)

action	energy saving achieved 2015 (kWh)	energy saving achieved 2016 (kWh)	energy saving achieved 2017 (kWh)
Tartaglia plant – well field - actions on networks and division into districts (Municipalities of San Giorgio a Cremano and Portici)	-	833,424	-
Scafati treatment plant - removal of waste water in the tanks for secondary pumping, rationalisation of the biological oxidisation system - installation of the new lighting system using LED bulbs (Municipality of Scafati)	-	676,424	864,448
Suppezza plant – well field - installation of load regulation valve and remote control of the latter (Municipality of Castellammare di Stabia)	-	466,396	-
Fontana Grande plant – pumping – actions on networks and division into districts (Municipality of Castellammare di Stabia)	-	418,929	-
Murata plant - lifting - regulation and functioning electric pumps via inverter (Municipality of Cercola)	812,000	385,525	-
Sala well - actions on networks and division into districts (Municipality of Corbara)	-	101,586	
Parrocchia well - actions on networks and division into districts (Municipality of Palma Campa)	30,000	69,951	46,664
Torretta well - actions on networks and division into districts (Municipality of Pagan)	48,000	31,699	-
Spiano well - actions on networks and division into districts (Municipality of Mercato S. Severino)	58,000	13,353	-

UMBRA ACQUE SPA

Umbra Acque SpA is a company with predominantly public capital, in which Acea SpA has a 40% interest. Since 1 January 2003 the company manages the integrated water service for Optimum Area of Operations - Umbria 1, consisting of 38 municipalities, of which 37 in the province di Perugia and 1 (San Venanzo) in the province of Terni, serving a total population of around 500,000 inhabitants.

DATA ON HUMAN RESOURCES

UMBRA ACQUE SPA EMPLOYEES: BREAKDOWN OF HUMAN RESOURCES (2016-2017)

(no.)	2016				2017			
	men	women	**total**	%	men	women	**total**	%
executives	6	0	**6**	1.8	4	0	**4**	1.2%
managers	6	2	**8**	2.4	7	2	**9**	2.7%
white-collar workers	63	50	**113**	34.1	63	58	**121**	35.9%
blue-collar workers	204	0	**204**	61.6	203	0	**203**	60.2%
total	**279**	**52**	**331**	**100**	**277**	**60**	**337**	**100%**

UMBRA ACQUE SPA EMPLOYEES: CONTRACT TYPE (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
permanent workforce (open-ended contracts)	277	52	**329**	272	50	**322**
(of which) part-time staff	*1*	*9*	***10***	*2*	*8*	***10***
staff with fixed-term contracts	2	0	**2**	5	9	**14**
staff with professional apprenticeship contracts	0	0	**0**	0	1	**1**
total	**279**	**59**	**331**	**277**	**60**	**337**

INDUSTRIAL ACCIDENTS AND FREQUENCY AND SEVERITY INDICES (2016-2017)

	2016	2017 (*)
accidents (no.)	8	15
total days of absence (*)	400	1,212
hours worked	549,238.58	568,260
index of frequency (fi) (no. accidents x 1,000,000/work hours)	**10.92**	**26.39**
index of seriousness (si) (days absence x 1,000/work hours)	**0.54**	**2.13**

(*) The value "hours worked" 2017 was estimated; the IF and IG indices are also consequent to estimation.

COURSES AND TRAINING COSTS IN UMBRA ACQUE SPA (2016-2017)

type of course	courses (no.)		editions (no.)		training (hours)		costs (Euros)	
	2016	2017	2016	2017	2016	2017	2016	2017 (*)
advanced training	0	0	0	0	0	0	0	0
technical-specialist	66	37	114	58	7,872.5	1,929	317,300	77,748
legal	15	7	15	7	240	61	4,370	1,110
managerial	10	11	10	11	112	706	4,500	28,366
administrative-managerial	0	0	0	0	0	0	0	0
safety	0	0	0	0	0	0	0	0
total	**91**	**55**	**139**	**76**	**8,224.5**	**2,696**	**326,170**	**107,224**

(*) Costs 2017 were calculated proportionately to the hourly cost related to the previous year.

TRAINED EMPLOYEES (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
	279	52	**331**	277	60	**337**

NETWORKS AND PLANTS CONSISTENCY AND ENVIRONMENTAL FIGURES

WATER SYSTEM MANAGED BY UMBRA ACQUE SPA (2015-2017)

	2015	2016	2017
water network (km)	6,398	6,398	6,071
aqueducts and transport networks (km)	*385*	*385*	*1,363*
distribution network (km)	*6,013*	*6,013*	*4,708*
well intake structures (no.)	215	219	222
spring intake structures (no.)	267	289	289
river intake structures (no.)	2	2	2
lifting stations (no.)	161	238	250
piezometers (no.)	1	1	1
reservoirs (no.)	552	580	587
disinfection/treatment plants (no.)	250	249	250

CONSISTENCY OF THE PURIFICATION AND SEWERAGE PLANTS MANAGED BY UMBRA ACQUE SPA (2015-2017)

	2015	2016	2017
purification plants (no.)	117	117	117
sewerage lifting systems (no.)	189	206	216
sewerage network (km)	3,541	3,543	3,543

CERTIFICATIONS

In addition to the certification already obtained - ISO 9001:2008 certification, renewed in March 2015 and expiring in April 2018 (the certificate renewal visit is planned in February 2018), **SOA** certification for the OG6 categories in class II, OS22 in class III, and Qualification for planning and construction performance up to class VIII - Since 2013 Umbra Acque has taken steps for the Accreditation of the internal analysis Laboratory according to standard **UNI EN CEI ISO/IEC 17025:2005** by the ACCREDIA agency, relating to **pH** and **manganese** parameters in natural water matrices. Laboratory accreditation was extended to **metals** (antimony, arsenic, cadmium, chromium, copper, lead, vanadium, aluminium, iron, manganese, nickel and selenium) and **anions** (bromides, chlorides, fluorides, nitrates, nitrites, sulphates) as well as **3 macro biological tests** (coliform bacteria at 37°C, Escherichia Coli and Enterococchi) for the water matrix intended for human consumption. In 2018 the accreditation shall be extended to other parameters that are currently under certification.
The Health and Safety management system according to **OHSAS 18001** is still valid. The relevant certificate was issued in January 2016 and is valid until January 2019.

UMBRA ACQUE SPA ENVIRONMENTAL ACCOUNTS (2015-2017)

PRODUCTS AND ANALYTICAL TESTS	u. m.	2015	2016	2017	Δ% 2017/2016
DRINKING WATER					
drinking water from the environment	**Mm³**	**58.51**	**58.17**	**58.63**	**0.8**
from wells	*Mm³*	*44.91*	*44.30*	*46.85*	*5.8*
from springs	*Mm³*	*13.60*	*13.87*	*11.78*	*-15.1*
water from other aqueduct systems	**Mm³**	**1.15**	**1.07**	**1.21**	**13.18**
drinking water introduced into the network	**Mm³**	**59.43**	**59.00**	**59.59**	**1.0**
total drinking water supplied	**Mm³**	**29.03**	**27.83**	**28.04**	**0.8**
ASSESSMENT OF LEAKAGE ACCORDING TO MINISTERIAL DECREE NO. 99/97 ALSO IN COMPLIANCE WITH ARERA REQUIREMENTS					
overall leakage (parameter A17)	Mm³	25.27	26.04	26.08	0.2
Real leakage (parameter A15 of DM 99/97)	Mm³	23.79	24.59	24.67	0.3
TREATED WASTEWATER					
water treated in the main treatment plants	**Mm³**	**58.0**	**59.2**	**56.0**	**-5.1**
ANALYTICAL TESTS ON DRINKING WATER AND WASTEWATER					
no. analytical tests on drinking water	**no.**	**64,420**	**69,820**	**71,250**	**2.0**
no. analytical tests on waste water	**no.**	**38,765**	**36,169**	**38,128**	**6.4**
no. analytical tests on surface water (*)	**no.**	**2,500**	**2,600**	**8,500**	**226.9**

(*) The higher value is associated to the startup (expected in 2018) of the new drinking water plant in Citerna, which uses surface water to be converted to drinking water to supply the aqueduct named "AVT".

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
COLLECTION, TRANSPORTATION AND DISTRIBUTION OF DRINKING AND NON-DRINKING WATER					
materials					
sodium hypochlorite	t	73.15	52.1	**60.0**	15.2
sodium hypochlorite	t	167.0	153	**200.0**	30.7
hydrochloric acid	t	166.2	150.6	**200.0**	32.8
aluminium polychloride	t	4	4	**12.0**	200.0
phosphoric acid 10%	t	0	6.4	**9.0**	40.6
acetic acid	t	0	86.7	**100.0**	15.3
ELECTRICITY (*)					
total electricity for drinking water	**GWh**	**64.33**	**63.20**	**71.86**	**13.7**
electricity for water lifting stations	*GWh*	*63.97*	*62.85*	*71.49*	*13.7*
electricity for offices	*GWh*	*0.36*	*0.36*	*0.37*	*2.8*

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
WASTEWATER PURIFICATION					
materials					
polyelectrolyte emulsion	t	69.3	78.7	**80.0**	1.7
ferric chloride (40%)	t	25.6	49.6	**40.0**	-19.4
mineral oil and fats (*)	t	1.40	1.40	**1.40**	-
ELECTRICITY FOR WASTEWATER					
total electricity for wastewater	**GWh**	**21.16**	**20.58**	**20.93**	**1.7**
electricity for purification	*GWh*	*16.96*	*16.27*	*16.97*	*4.3*
electricity for lifting stations	*GWh*	*4.07*	*4.19*	*3.84*	*-8.4*
electricity for offices	*GWh*	*0.13*	*0.12*	*0.12*	-
OTHER CONSUMPTION					
other drinking water consumption (*)	**m^3**	**28,889**	**28,889**	**28,889**	**-**
drinking water consumed for non-industrial water uses (the data relate to consumption for offices, outside showers, etc.)	*m^3*	*2,282*	*2,282*	*2,282*	-
drinking water consumed for process water uses (washing machinery and bays, etc.)	*m^3*	*26,607*	*26,607*	*26,607*	-

(*) In the absence of better estimated, the data for 2016 and 2017 are presumed as equal to those for 2015.

WASTE	u. m.	2015	2016	2017	Δ% 2017/2016
SPECIFIC WASTE FROM WASTEWATER PURIFICATION					
treatment sludge	t	22,987	23,099	19,573	-15.3
sand and sediment from treatment	t	1,290	1,321	1,238	-6.3
WASTE PURSUANT TO LEGISLATIVE DECREE NO. 152/06 EXCLUDING SLUDGE AND SAND (**)					
hazardous waste	t	7.5	11.8	886	-24.6
non-hazardous waste (*)	t	22,169.5	16,747.5	9,604.6	-42.7

(*) The clearly lower value for non-hazardous waste is due to a lower production of soil and rocks (CER170504), bituminous mixtures (CER170302), mixed waste from maintenance and demolition activities (CER170904) attributable to outsourcing the maintenance interventions.

TOTAL COD IN INPUT AND OUTPUT (2015-2017)

(t/year)	2015	2016	2017
COD_{out}	2,516.97	3,411.79	3,079.46
COD_{in}	22,308.35	21,312.71	24,015.45

OUTPUT PARAMETERS FOR THE MAIN TREATMENT PLANTS MANAGED BY ACQUE SPA (2015-2017)

parameter	average of values (mg/l) 2015	average of values (mg/l) 2016	average of values (mg/l) 2017
BOD_5	18.2	29.3	24.4
COD	43.3	57.6	55.0
SST	19.7	33.7	25.1
NH_4^+	5.6	5.3	7.3
phosphorous	2.2	1.9	2.3

TREATMENT EFFICIENCY OF THE MAIN TREATMENT PLANTS MANAGED BY UMBRA ACQUE SPA (2015-2017)

parameter	average of values (%) 2015	average of values (%) 2016	average of values (%) 2017
$100x(COD_{in} - COD_{out})/COD_{in}$	88.7	84.0	87.2
$100x(SST_{in} - SST_{out})/SST_{in}$	95.7	91.4	94.5
$100x(NH_4+_{in} - NH_4+_{out})/ NH_4+_{in}$	83.5	85.9	83.3
$100x(PO_4^{-3}{}_{in} - PO_4^{-3}{}_{out})/ PO_4^{-3}{}_{in}$	32.5	38.9	35.9

The energy efficiency interventions took place in the two-year period 2014-2015.

UMBRA ACQUE SPA ENERGY EFFICIENCY (2015-2017)

action	energy saving achieved 2015 (kWh)	energy saving achieved 2016 (kWh)	energy saving achieved 2017 (kWh)
replacement of pumps and motors: Petrignano-Bastia Umbra PG plant	385,000	-	-

PUBLIACQUA

Publiacqua SpA is a mixed company, for the majority in public hands; Acea's equity interest is through the company Acque Blu Fiorentine SpA. It has managed the integrated water service in Ato 3 – Medio Valdano since 2002. The territory includes around 1.3 million inhabitants, with cities of great artistic and environmental merit, including Florence, Prato and Pistoia.

HUMAN RESOURCES IN FIGURES

PUBLIACQUA SPA EMPLOYEES: BREAKDOWN OF HUMAN RESOURCES (2016-2017)

(no.)	2016				2017			
	men	women	**total**	weight %	men	women	**total**	weight %
executives	3	1	**4**	0.7	3	1	**4**	0.7
managers	11	7	**18**	3.1	10	8	**18**	3.2
white-collar workers	170	135	**305**	52.7	170	132	**302**	52.9
blue-collar workers	246	6	**252**	43.5	241	6	**247**	43.3
total	**430**	**149**	**579**	**100.0**	**424**	**147**	**571**	**100.0**

PUBLIACQUA SPA EMPLOYEES: CONTRACT TYPE (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
permanent workforce (open-ended contracts)	429	149	**578**	423	147	**570**
(of which) part-time staff	*3*	*13*	***16***	*4*	*12*	***16***
staff with fixed-term contracts	1	0	**1**	1	0	**1**
staff with professional apprenticeship contracts	0	0	**0**	0	0	**0**
total	**430**	**149**	**579**	**424**	**147**	**571**

INDUSTRIAL ACCIDENTS AND FREQUENCY AND SEVERITY INDICES (2016-2017)

	2016	2017 (*)
accidents (no.)	25	23
total days of absence (*)	753	301
hours worked (**)	949,663	934,000
index of frequency (fi) (no. accidents x 1,000,000/work hours)	**26.33**	**24.63**
index of seriousness (si) (days absence x 1,000/work hours)	**0.79**	**0.32**

(*) The value also includes days of absence related to persistent or reopened injuries taking place in previous years.

(**) The datum is taken from an estimate for December.

COURSES AND TRAINING COSTS IN PUBLIACQUA SPA (2016-2017)

type of course	courses (no.)		editions (no.)		training (hours)		costs (Euros)	
	2016	2017	2016	2017	2016	2017	2016	2017 (*)
advanced training	52	37	52	37	1,517.5	843.5	40,000	37,000
IT	5	10	12	24	748.0	1,209.0	37,000	23,000
linguistic	0	1	0	12	0.0	186.5	0	4,800
technical-specialist	39	38	138	71	5,737.0	1,902.0	90,000	23,000
managerial	10	1	28	7	1,700.0	137.5	21,000	9,000
administrative-managerial	71	39	158	87	8,933.5	3,301.5	390,000	73,000
safety	21	32	80	116	3,594.0	5,393.5	50,000	45,000
total	**198**	**158**	**468**	**354**	**22,230**	**12,973.5**	**628,000**	**214,800**

TRAINED EMPLOYEES (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
	430	149	**579**	424	147	**571**

In 2017 training mainly concerned the 9001 topics of safety and OHSAS 18001 and ISO management systems.

NETWORKS AND PLANTS CONSISTENCY AND ENVIRONMENTAL DATA

WATER SYSTEM MANAGED BY PUBLIACQUA SPA (*) (2015-2017)

	2015	2016	2017
water network (km)	7,155	7,163	7,162
aqueducts and transport networks (km)	*1,347*	*1,347*	*1,347*
distribution network (km)	*5,808*	*5,816*	*5,815*
well intake structures (no.)	474	487	485
spring intake structures (no.)	832	829	824
river intake structures (no.)	55	55	54
lake intake structures (no.)	19	19	20
lifting stations (no.)	417	417	421
reservoirs (no.)	907	906	907
disinfection/treatment plants (no.)	136	138	102

(*) The data are consistent with the communication to ARERA concerning the managed infrastructures.

CONSISTENCY OF THE PURIFICATION AND SEWERAGE PLANTS MANAGED BY PUBLIACQUA SPA (*) (2015-2017)

	2015	2016	2017
purification plants (no.)	128	127	127
sewerage lifting systems (no.)	209	202	208
purification plants (no.)	3,720	3,676	3,676

(*) The data are consistent with the communication to ARERA concerning the managed infrastructures and discount a different reclassification.

CERTIFICATIONS

During the course of 2017 Publiacqua passed the supervisory visit in order to retain quality certification according to version **UNI EN ISO 9001:2015**, for the activities of "Supplying the integrated drinking water and treatment service for urban, industrial and domestic wastewater Laboratory analysis activities for chemical and microbiological checks on the water cycle. Treatment of non-hazardous liquids. Design of the integrated systems and management of tenders for the construction of treatment plants, drinking water and water and sewerage networks. Production of hydroelectric energy". It also retained its environmental certification according to **UNI EN ISO 14001:2004** for the activities described above, having passed the supervisory visit from ACCREDIA according to standard **UNI CEI ISO/IEC 17025:2005** and obtained Health and Safety Management certification pursuant to standard **OHSAS 18001:2007**.

ENVIRONMENTAL ACCOUNTS OF PUBLIACQUA SPA (2015-2017)

PRODUCTS AND ANALYTICAL TESTS	u. m.	2015	2016(*)	2017	Δ% 2017/2016
DRINKING WATER					
drinking water from the environment	**Mm³**	**169.2**	**168.0**	**167.0**	**-0.6**
from lakes/rivers	*Mm³*	*112.2*	*105.7*	*105.2*	*-0.5*
from wells	*Mm³*	*45.9*	*50.6*	*50.2*	*-0.8*
from springs	*Mm³*	*11.1*	*11.7*	*11.6*	*-1.1*
drinking water introduced into the network	**Mm³**	**153.8**	**152.5**	**152.0**	**-0.4**
total drinking water supplied	**Mm³**	**82.4**	**81.0**	**81.0**	**-**
ASSESSMENT OF LEAKAGE ACCORDING TO MINISTERIAL DECREE NO. 99/97 ALSO IN COMPLIANCE WITH ARERA REQUIREMENTS					
overall leakage (parameter A17)	Mm³	**67.2**	**67.0**	**66.4**	-0.9
actual leakage (parameter A15 of Ministerial Decree 99/97)	Mm³	**56.1**	**56.0**	**55.5**	-0.9
TREATED WASTEWATER					
water treated in the main treatment plants	**Mm³**	**106.8**	**106.8**	**102.0**	**-4.5**
ANALYTICAL TESTS ON DRINKING WATER AND WASTEWATER					
no. analytical tests on drinking water	**n.**	**227,346**	**220,7807**	**225,260**	**2.0**
no. analytical tests on surface water (**)	*n.*	*21,745*	*21,447*	*22,743*	*6.0*
no. analytical tests on wastewater	**n.**	**42,196**	**40,906**	**41,263**	**0.9**

(*) The data for 2016 have been adjusted respect to those published.

(**) This concerns analyses on crude surface water (untreated); they are include in the value for the analytical tests on drinking water.

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
COLLECTION, TRANSPORTATION AND DISTRIBUTION OF DRINKING AND NON-DRINKING WATER					
materials					
sodium hypochlorite	t	1,428	1,396	**1,415**	1.4
sodium chloride	t	264	314	**238**	-24.2
hydrochloric acid	t	303	359	**260**	-27.6
flocculant	t	4,438	5,474	**4,050**	-26.0
carbon in powder	t	0	0	**0**	-
purate	t	334	384	**430**	12.0
sulphuric acid	t	564	586	**684**	16.7
oxygen	t	418	54	**32**	-40.7
acetic acid	t	186	143	**76**	-46.9
carbon dioxide excluding drinking fountains	t	722	705	**772**	9.5
ferrous chloride	t	18	31	**31**	-
phosphoric acid	t	26	19	**13**	-31.6
sodium hydroxide	t	0	0	**0**	-
ELECTRICITY(*)					
total electricity for drinking water	**GWh**	**79.7**	**79.5**	**79.7**	0.3
electricity for water lifting stations	*GWh*	*78.6*	*78.4*	*78.6*	*0.3*
electricity for offices	*GWh*	*1.1*	*1.1*	*1.1*	-
WASTEWATER PURIFICATION					
materials					
polyelectrolyte emulsion	t	222	236	**308**	30.5
sodium hypochlorite	t	8	13	**15**	15.4
peracetic acide, caustic soda, polyamine/anti-foaming agent	t	6	7	**7**	-
polyaluminium chloride (PAC)	t	3,121	4,318	**4,120**	-4.6

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
WASTEWATER PURIFICATION					
calcium	t	209	224	**305**	36.2
acetic acid 80%	t	31	272	**304**	11.8
ELECTRICITY FOR WASTEWATER					
total electricity for wastewater	**GWh**	**34.1**	**36.2**	**35.3**	**-2.7**
electricity for purification	*GWh*	*29.3*	*31.2*	*31.5*	*0.8*
electricity for lifting stations	*GWh*	*4.3*	*4.5*	*3.3*	*-26.7*
electricity for offices	*GWh*	*0.5*	*0.5*	*0.5*	*-5.0*
OTHER CONSUMPTION					
other consumption drinking water	**m^3**	**n.a.**	**n.a.**	**n.a.**	**-**

(*) The data for 2016 have been adjusted.

WASTE	u. m.	2015	2016	2017	Δ% 2017/2016
SPECIFIC WASTE FROM WASTEWATER PURIFICATION(*)					
treatment sludge	t	26,019	26,159	28,792	10.1
sand and sediment from treatment	t	1,297	1,086	767	-29.3
WASTE PURSUANT TO LEGISLATIVE DECREE NO. 152/06 EXCLUDING SLUDGE AND SAND (*)					
hazardous waste	t	44	46	39	-15.2
non-hazardous waste	t	10,140	11,570	9,606	-17.0

(*) The data for 2016 have been adjusted.

TOTAL COD IN INPUT AND OUTPUT (2015-2017)

(t/year)	2015	2016	2017
COD_{out}	1,893	1,774	1,756
COD_{in}	17,095	16,441	18,605

OUTPUT PARAMETERS FOR THE MAIN TREATMENT PLANTS MANAGED BY PUBLIACQUA SPA – SAN COLOMBANO (2015-2017)

parameter	average of values (mg/l) 2015	average of values (mg/l) 2016	average of values (mg/l) 2017
BOD_5	1.9	2.2	2.1
COD	15.8	15.6	16.0
SST	4.5	7.6	6.0
NH_4^+	0.7	1.1	0.7
fosforo	1.0	0.9	0.9

NB The San Colombano (600,000 AE) purification plant treats about half of the global wastewater.

OUTPUT PARAMETERS: GROUP OF 36 PURIFICATION PLANTS, INCLUDING SAN COLOMBANO, WHICH COMPREHENSIVELY TREAT 98% OF WASTEWATER AND 96% OF THE ORGANIC LOAD (COD) OF PUBLIACQUA SPA (2015-2017)

parameter	average of values (mg/l) 2015	average of values (mg/l) 2016	average of values (mg/l) 2017
BOD_5	2.4	2.4	4.1
COD	17.7	16.6	24.7
SST	5.2	6.7	7.1
NH_4^+	1.1	1.3	3.2
fosforo	1.2	1.0	2.0

PURIFICATION EFFICIENCY OF THE MAIN PURIFICATION PLANTS MANAGED BY PUBLIACQUA SPA (2015-2017)

parameter	average of values (mg/l) 2015	average of values (mg/l) 2016	average of values (mg/l) 2017
$100x(COD_{in} - COD_{out})/COD_{in}$	87.0	85.7	89.4
$100x(SST_{in} - SST_{out})/SST_{in}$	91.4	84.0	92.1
$100x(NH_{4\,in}^{+} - NH_{4\,out}^{+})/ NH_{4\,in}^{+}$	97.0	94.8	97.1
$100x(PO_{4\,in}^{-3} - PO_{4\,out}^{-3})/ PO_{4\,in}^{-3}$	60.9	67.2	70.9

PURIFICATION EFFICIENCY: GROUP OF 36 PURIFICATION PLANTS, INCLUDING SAN COLOMBANO, WHICH COMPREHENSIVELY TREAT 98% OF WASTEWATER AND 96% OF THE ORGANIC LOAD (COD) OF PUBLIACQUA SPA (2015-2017)

parameter	average of values (%) 2015	average of values (%) 2016	average of values (%) 2017
$100x(COD_{in} - COD_{out})/COD_{in}$	88.9	89.2	90.6
$100x(SST_{in} - SST_{out})/SST_{in}$	93.3	89.9	93.2
$100x(NH_{4\ in}^{+} - NH_{4\ out}^{+})/ NH_{4\ in}^{+}$	95.2	94.6	95.5
$100x(PO_{4\ in}^{-3} - PO_{4\ out}^{-3})/ PO_{4\ in}^{-3}$	61.2	66.5	67.4

As regards energy efficiency, in 2017 the main results were achieved by increasing efficiency in the delivery and drinking water conversion of water taken from the Prato water table.

ENERGY EFFICIENCY PUBLIACQUA SPA (2015-2017)

action	energy saving achieved 2015 (kWh)	energy saving achieved 2016 (kWh)	energy saving achieved 2017 (kWh)
Soa La Querce plant- increased efficiency in lifting station	300,000	-	-
Ponte a Niccheri plant - installation of fine-bubble diffusers	150,000	-	-
Anconella drinking water conversion plant – check valve boosted	-	115,000	-
falda 1 (Falda di Prato) – new pumps boosted	-	100,000	100,000
falda 2 - inverter pumps boosted	-	100,000	-

ACQUEDOTTO DEL FIORA

Acquedotto del Fiora SpA has managed the integrated water service for the largest Optimal Area of Operations in Tuscany, Ato 6 – Ombrone, comprising 56 municipalities and covering an area of over 7,600 km2, since 1 January 2002. The resident population is around 406,453 inhabitants, a figure which almost doubles during the summer season.

The territory served has many **protected areas featuring high biodiversity**, including in particular, due to their special natural importance, Maremma Natural Park and Monte Labro Natural Park. Activities for management of the water service relate to both networks (aqueduct and sewers) and plants (water purification, wastewater treatment, desalination, etc.) of the 28 municipalities of the province of Grosseto and 28 (out of a total 36) municipalities of the province of Siena.

HUMAN RESOURCES IN FIGURES

ACQUEDOTTO DEL FIORA SPA EMPLOYEES: BREAKDOWN OF HUMAN RESOURCES (2016-2017)

(no.)	2016				2017			
	men	women	**total**	weight %	men	women	**total**	weight %
executives	1	0	**1**	0.2	1	0	**1**	0.3
managers	10	4	**14**	3.5	11	5	**16**	3.9
white-collar workers	100	93	**193**	48.4	125	99	**224**	55.0
blue-collar workers	189	2	**191**	47.9	165	1	**166**	40.8
total	**300**	**99**	**399**	**100.0**	**302**	**105**	**407**	**100**

ACQUEDOTTO DEL FIORA SPA EMPLOYEES: CONTRACT TYPE (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
permanent workforce (open-ended contracts)	297	99	**396**	299	100	**399**
(of which) part-time staff	*4*	*11*	***15***	*4*	*13*	***17***
staff with fixed-term contracts	1	0	**1**	2	5	**7**
staff with professional apprenticeship contracts	2	0	**2**	1	0	**1**
total	**300**	**99**	**399**	**302**	**105**	**407**

INDUSTRIAL ACCIDENTS AND FREQUENCY AND SEVERITY INDICES (2016-2017)

	2016	2017
accidents (no.)	5	6
total days of absence (*)	91	92
hours worked	671,369	656,850
index of frequency (fi) (no. accidents x 1,000,000/work hours)	**7.45**	**9.13**
index of seriousness (si) (days absence x 1,000/work hours)	**0.14**	**0.14**

(*) The value also includes the days of absence due to the continuing or returning effects of accidents occurring in previous years.

TRAINING COURSES AND COSTS IN ACQUEDOTTO DEL FIORA SPA (2016-2017)

type of course	courses (no.)		editions (no.)		training (hours)		costs (Euros)	
	2016	2017	2016	2017	2016	2017	2016	2017
IT	93	11	167	23	12,272	1,701	327,730	8,123
induction of new recruits	1	1	1	4	32	64	-	-
technical-specialist	8	3	12	55	759	1,925	2,217	17,614
managerial	4	1	14	7	2,436	89	52,700	12,200
administrative-managerial	8	13	11	17	835	610	10,506	6,960
safety	10	11	39	32	2,310	3,674	10,614	7,856
total	**124**	**40**	**244**	**138**	**18,644**	**8,063**	**403,769**	**52,753**

TRAINED EMPLOYEES (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
	300	95	**395**	271	80	**351**

NETWORK AND PLANT CONSISTENCY AND ENVIRONMENTAL DATA

WATER SYSTEM MANAGED BY FIORA SPA (2015-2017)

	2015 (active)	2016 (active)	2017 (active)
water network (km)	9,067	9,294	9,315
aqueducts and transport networks (km)	*1,963*	*1,955*	*1,967*
distribution network (km)	*7,104*	*7,339*	*7,348*
well intake structures (no.)	188	184	184
spring intake structures (no.)	249	248	248
river intake structures (no.)	1	1	1
lake intake structures (no.)	6	3	3
lifting stations (no.)	273	284	284
piezometers (no.)	13	13	13
reservoirs (no.)	785	796	796
disinfection/treatment plants (no.)	32	31	31
seawater desalting plant (no.)	3	3	3

CONSISTENCY OF THE PURIFICATION AND SEWERAGE PLANTS MANAGED BY ACQUEDOTTO DEL FIORA SPA (2015-2017)

	2015	2016	2017
purification plants (no.) (*)	141	142	144
sewerage lifting systems (no.)	266	270	271
sewerage network (no.)	3,211	3,214	3,215

(*) Excludes Imhoff ditches.

CERTIFICATIONS

In 2017 Acquedotto del Fiora retained certification for its management system according to standard **UNI EN ISO 9001:2008** and obtained certification for its health and safety management system according to standard **BS OHSAS 18001**.

ACQUEDOTTO DEL FIORA SPA ENVIRONMENTAL ACCOUNTS (2015-2017)

PRODUCTS AND ANALYTICAL TESTS	u. m.	2015	2016	2017	Δ% 2017/2016
DRINKING WATER					
drinking water from the environment	**Mm^3**	**62.47**	**60.72**	**60.5 (*)**	**-0.4**
from lakes/rivers	*Mm^3*	*1.08*	*0.72*	*n.a.*	-
from wells	*Mm^3*	*19.57*	*19.36*	*n.a.*	-
from springs	*Mm^3*	*41.81*	*40.31*	*n.a.*	-
drinking water from other aqueduct systems	**Mm^3**	**0.79**	**0.72**	**0.75 (*)**	**4.2**
drinking water introduced into the network	**Mm^3**	**57.85**	**56.27**	**56.00 (*)**	**-0.5**
total drinking water supplied	**Mm^3**	**29.35**	**29.40**	**29.0 (*)**	
ASSESSMENT OF LEAKAGE ACCORDING TO MINISTERIAL DECREE NO. 99/97 ALSO IN COMPLIANCE WITH ARERA REQUIREMENTS					
overall leakage (parameter A17)	Mm^3	27.59	27.61	n.a.	-
actual leakage (parameter A15 of Ministerial Decree 99/97)	Mm^3	25.77	26.05	n.a.	-
TREATED WASTEWATER					
water treated in the main treatment plants	**Mm^3**	**17.07**	**16.16**	**n.a.**	-
water treated in plants having power exceeding 2,000 AE	**Mm^3**	**25.1**	**25.2**	**n.a.**	
ANALYTICAL TESTS ON DRINKING WATER AND WASTEWATER					
no. analytical tests on drinking water	**no.**	**97,456**	**81,216**	**76,459**	**-5.9**
no. analytical tests on wastewater	**no.**	**53,883**	**44,730**	**44,304**	**-1.0**
no. analytical tests on surface water	**no.**	**813**	**631**	**678**	**7.4**

(*) The data for 2017 at the time of publication are not available. Insert estimated for some items.

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
COLLECTION, TRANSPORTATION AND DISTRIBUTION OF DRINKING AND NON-DRINKING WATER					
materials					
sodium hypochlorite	t	278	493	**228**	-53.8
sodium chloride	t	7	5	**5**	-
hydrochloric acid	t	14	2	**3**	50.0
carbon in powder	t	29	19	**0**	-
polyaluminium chloride (PAC)	t	15.7	31	**10**	-67.7
ELECTRICITY					
total electricity for drinking water	**GWh**	**31.1**	**35.9**	**36.7**	**2.2**
electricity for lifting stations	*GWh*	*20.1*	*21.1*	*26.7*	*25.5*
electricity for offices	*GWh*	*0.3*	*0.4*	*0.4*	-
WASTEWATER PURIFICATION					
materials					
polyelectrolyte emulsion	t	163.65	150.48	**132.30**	-12.1
sodium hypochlorite	t	417.33	432.76	**323.86**	-25.2
polyaluminium chloride (pac)	t	67.40	66.82	**64.35**	-3.7
ELECTRICITY FOR WASTEWATER					
total electricity for wastewater	**GWh**	**23.9**	**20.0**	**24.1**	**20.5**
electricity for purification	*GWh*	*20.4*	*17.4*	*21.8*	*25.3*
electricity for lifting stations	*GWh*	*3.5*	*3.6*	*2.4*	*-33.3*
OTHER CONSUMPTION					
other drinking water consumption	**m^3**	**n.a.**	**n.a.**	**n.a.**	**-**

In some purification plants of Ponte a Tressa in the municipality of Siena, there is an industrial water network which allows treated wastewater for washing machinery and for the bathrooms in the office building. Moreover, at the Punta Ala purification plant in the Municipality of Castiglion della Pescaia, treated water is reused for irrigation purposes.

WASTE	u. m.	2015	2016	2017	Δ% 2017/2016
SPECIFIC WASTE FROM WASTEWATER PURIFICATION					
treatment sludge	t	13,031	11,625.51	11,289.34	-2.9
sand and sediment from treatment	t	748	507.32	484.40	-4.5
WASTE PURSUANT TO LEGISLATIVE DECREE NO. 152/06 EXCLUDING SLUDGE AND SAND					
hazardous waste	t	64.44	74.36	48.42	-34.9
non-hazardous waste	t	707.76	666.74	732.51	9.9

TOTAL COD IN INPUT AND OUTPUT (2015-2017)

(t/year)	2015	2016	2017
COD_{out}	832	900	720
COD_{in}	6,875	7,990	6,428

OUTPUT PARAMETERS FOR THE MAIN TREATMENT PLANTS MANAGED BY ACQUEDOTTO DEL FIORA SPA (*) (2015-2017)

parameter	average of values (%) 2015	average of values (%) 2016	average of values (%) 2017
BOD_5	12.6	13.4	7.9
COD	48.8	55.6	41.0
SST	14.6	12.5	10
NH_4^+	4.9	4.8	6.4
phosphorus	2.3	2.5	2.6

(*) Plants having power >20,000 AE.

PURIFICATION EFFICIENCY OF THE MAIN PURIFICATION PLANTS MANAGED BY ACQUEDOTTO DEL FIORA SPA (*) (2015-2017)

parameter	average of values (%) 2015	average of values (%) 2016	average of values (%) 2017
$100x(COD_{in} - COD_{out})/COD_{in}$	87.9	88.7	**88.8**
$100x(SST_{in} - SST_{out})/SST_{in}$	91.7	93.7	**92.9**
$100x(NH_{4\ in}^{+} - NH_{4\ out}^{+})/ NH_{4\ in}^{+}$	86.6	85.4	**81.8**
$100x(PO_{4\ in}^{-3} - PO_{4\ out}^{-3})/ PO_{4\ in}^{-3}$	46.3	53.5	**46.0**

(*) Plants having power > 20.000 AE.

Acquedotto del Fiora brought about interventions to increase energy efficiency both in the context of known technologies (inverter, high efficiency motors, recourse to LED technology for lighting, more efficient pumps, remote control) and developing **pilot projects**, especially regarding more energy consuming plants. The table shows the main actions with an estimate of the related energy saving.

ENERGY EFFICIENCY ACQUEDOTTO DEL FIORA (2015-2017)

action	achieved energy saving 2015 (kWh)	achieved energy saving 2016 (kWh)	achieved energy saving 2017 (kWh)
increased efficiency of drinking water pumping systems	240,000	129,682	225,000
increased efficiency of purification processes	500,000	-	-
bulb lights replaced with LED lights	10,000	10,000	2,100

ACQUE

Acque SpA operates as the sole operator of the integrated water cycle in Basso Valdarno, an area covering five Tuscan provinces. The service is provided in 56 municipalities in the provinces of Florence, Lucca, Pisa, Pistoia, and Siena, corresponding to Territorial Conference 2 Basso Valdarno.

HUMAN RESOURCES IN FIGURES

ACQUE SPA EMPLOYEES: BREAKDOWN OF HUMAN RESOURCES (2016-2017)

(no.)	2016				2017			
	men	women	**total**	weight %	men	women	**total**	weight %
executives	5	2	**7**	1.8	4	2	**6**	1.5
managers	5	3	**8**	2.0	5	4	**9**	2.25
white-collar workers	93	136	**229**	57.7	94	144	**238**	59.35
blue-collar workers	153	0	**153**	38.5	148	0	**148**	36.90
total	**256**	**141**	**397**	**100.0**	**251**	**150**	**401**	**100.0**

ACQUE SPA EMPLOYEES: CONTRACT TYPE (2016-2017)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
permanent workforce (open-ended contracts)	253	131	**384**	250	140	**390**
(of which) part-time staff	*4*	*30*	***34***	*4*	*32*	***36***
staff with fixed-term contracts	9	3	**12**	1	10	**11**
staff with professional apprenticeship contracts	0	1	**1**	0	0	**0**
total	**262**	**135**	**397**	**251**	**150**	**401**

INDUSTRIAL ACCIDENTS AND FREQUENCY AND SEVERITY INDICES (2016-2017) (*)

	2016	2017 (*)
accidents (no.)	5	9
total days of absence (*)	122	173
hours worked (**)	635,053	639,710
index of frequency (fi) (no. accidents x 1,000,000/work hours)	**7.87**	**14.07**
index of seriousness (si) (days absence x 1,000/work hours)	**0.19**	**0.27**

(*) The increase in 2017 of frequency and severity indices can be attributed to a type of accident (no. 4) suffered by administration staff in offices which is to be considered as unsolved and exceptional respect to the historical phenomenon. Examining the accidents related to said staff (no. 5) the value of the frequency and severity indices are fully comparable to those of 2016.

(**) The value also excludes days of absent related to persistent or reopened injuries from previous years.

COURSES AND TRAINING COSTS IN ACQUE SPA (2016-2017)

type of course	courses (no.)		editions (no.)		training (hours)		costs (Euros)	
	2016	2017	2016	2017	2016	2017	2016	2017 (*)
IT	189	16	73	46	13,085	1,333	346,486 (**)	
induction of new recruits	1	1	1	3	520	313	0	
technical-specialist (***)	49	47	59	59	1,300	1,155	14,310	
managerial	2	3	5	13	1,226	521	50,847	
safety	29	21	61	65	1,893	2,853	3,315	
environment	5	3	6	10	310	442	1,200	
transversal (including Legislative Decree no. 231)	3	7	4	19	207	623	0	
totale	**278**	**98**	**209**	**215**	**18,541**	**7,240**	**416,158**	**134,711**

(*) The division of costs was not yet known for 2017 at the time of publication.

(**) Includes investment costs.

(***) Includes regulatory updates.

TRAINED EMPLOYEES (2016-2017) (*)

(no.)	2016			2017		
	men	women	**total**	men	women	**total**
	271	150	**421**	268	162	**430**

(*) The data, which exceed with consistency of the staffing structure, include employees from other companies in Gruppo Acque which carried out seconded company courses, as well as workers which only rendered service for some months of the year.

In 2017 training involved staff from all corporate sectors (operational management, sales, administration and human resources); a total of 7,240 hours of training was provided, excluding e-learning. The reduction in hours is to be attributed to the numerous courses which took place in 2016 regarding the new SAP IT systems for managing corporate processes, which did not required repetition in 2017. During the year, instead, several courses on ADR standards related to road transport of hazardous goods and Legislative Decree no. 231 of 2001 took place; furthermore, the first on-line training course related to the Integrated and Intergroup Management System was realised, with total coverage which involved 65% of the corporate workers over 7 months. Safety training, lastly, was notably increased in administered hours.

NETWORKS AND PLANTS CONSISTENCY AND ENVIRONMENTAL DATA

WATER SYSTEM MANAGED BY ACQUE SPA (active plants) (2015-2017)

	2015	2016	2017
water network (km)	5,898	5,912	5,921
aqueducts and transport networks (km)	*829*	*829*	*834*
distribution network (km)	*5,069*	*5,083*	*5,087*
well intake structures (no.)	428	531	531
spring intake structures (no.)	268	299	299
river and lake intake structures (no.)	14	22	21
reservoirs (no.)	547	569	568
disinfection/treatment plants (no.)	293	267	240
pumping stations (no.)	402	415	415

CONSISTENCY OF THE PURIFICATION AND SEWERAGE PLANTS MANAGED BY ACQUE SPA (2015-2017)

	2015	2016	2017
purification plants (no.)	139	139	139
sewerage lifting systems (no.)	517	527	531
sewerage network (no.)	3,081	3,095	3,066

CERTIFICATIONS

The integrated management system of Acque SpA **Best4 plus** (quality, environment, safety, energy and social responsibility) is still in force in 2017.
During the year the main novelties were: adaptation of the management system to the new edition of standard **SA8000 (edition 2014)**, and related certification as at June 2017; the implementation of the management system for **road safety according to UNI ISO 39001** and related certification; the implementation of the **management system 37001**, which shall be certified in 2018.

See www.acque.net for details.

ACQUE SPA ENVIRONMENTAL ACCOUNTS (2015-2017)

PRODUCTS AND ANALYTICAL TESTS	u. m.	2015	2016	2017	Δ% 2017/2016
DRINKING WATER					
drinking water from the environment	**Mm³**	**71.731**	**70.120**	**72.431**	**3.3**
from lakes/rivers	*Mm³*	*3.381*	*3.357*	*3.599*	*7.2*
from wells	*Mm³*	*60.657*	*59.993*	*62.958*	*4.9*
from springs	*Mm³*	*7.693*	*6.770*	*5.873*	*-13.2*
water collected from other aqueduct systems	**Mm³**	**6.859**	**7.027**	**6.858**	**-2.4**
drinking water transferred to other aqueduct systems	Mm³	0.98	0.953	1.072	12.5
production loss between collection and entry into the network	Mm³	3.769	2.440	3.866	58.4
drinking water entered into the corporate network	Mm³	73.84	73.754	74.350	0.8
drinking water entered into the network + drinking water transferred to other systems and production loss between collection and entry into the network	**Mm³**	**78.590**	**77.147**	**79.288**	**2.8**
total supplied drinking water	**Mm³**	**46.01**	**47.679**	**45.945**	**-3.6**
ASSESSMENT OF LEAKAGE ACCORDING TO MINISTERIAL DECREE NO. 99/97 ALSO IN COMPLIANCE WITH ARERA REQUIREMENTS					
overall leakage (parameter A17)	Mm³	27.25	27.028	28.405	5.1
actual leakage (parameter A15 of Ministerial Decree 99/97)	Mm³	18.39	18.315	19.315	5.5
TREATED WASTEWATER					
water treated in all the treatment plants	**Mm³**	**47.20**	**51.40**	**45.31**	**-15.7**
ANALYTICAL TESTS ON DRINKING WATER AND WASTEWATER					
no. analytical tests on drinking water *(including tests on surface water)*	**no.**	**234,950**	**278,603**	**266,850**	**-4.2**
no. analytical tests on wastewater	**no.**	**119,144**	**123,646**	**119,742**	**-3.2**

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
COLLECTION, TRANSPORTATION AND DISTRIBUTION OF DRINKING AND NON-DRINKING WATER					
materials					
laboratory reactants (chemical and microbiological sector)	t	2.53	2.49	**2.37**	-4.8
sodium hypochlorite	t	233.61	250.03	**220.30**	-11.89
sodium chloride	t	392.82	395.025	**394.51**	-0.13
potassium permanganate	t	4.30	3.00	**3.85**	28.33
polyaluminium chloride	t	38.01	17.91	**9.41**	-47.46
salt in bags	t	1	4.85	**7.05**	45.36
sodium hypochlorite	t	312.49	357.23	**377.47**	5.66
caustic soda	t	1.72	3.65	**1.12**	-69.31
sodium metabisulphate	t	2.70	1.25	**2.17**	73.6
phosphoric acid	t	0.42	0.15	**0.00**	-
citric acid	t	2.30	1.58	**1.98**	25.7
alifons L	t	0.105	-	**0.025**	-
aluminium polychlorosulphate	t	102.12	157.49	**170.22**	8.1

RESOURCES USED	u. m.	2015	2016	2017	Δ% 2017/2016
ELECTRICITY (*)					
total electricity for drinking water	**GWh**	**53.46**	**52.8**	**55.4**	**4.9**
electricity for water lifting stations	*GWh*	*53.0*	*51.55*	*55.09*	*6.9*
electricity for offices	*GWh*	*0.46*	*0.53*	*0.32*	*-39.6*
WASTEWATER PURIFICATION					
materials					
polyelectrolyte powder	t	3.00	1.00	**0.0**	-
polyelectrolyte emulsion	t	93.025	130.60	**131.98**	1.1
polyaluminium chloride	t	15.40	4.45	**9.00**	102.2
ferrous chloride for sludge dehydration (40%)	t	524.45	529.65	**437.83**	-17.3
sodium hypochlorite for final disinfection	t	9.965	1.00	**14.42**	-
peracetic acide for disinfection	t	13.00	9.5	**12.00**	26.3
sulphuric acid	t	4.15	0.0	**2.3**	-
ferrous chloride 31.5%	t	3.795	0.0	**10.22**	-
caustic soda 30% (sodium hydroxide) - Solvay	t	12.15	0.40	**1.57**	292.5
citric acid	t	1.30	-	**0.1**	-
biotek base L - biological reactivant	t	0	0.06	**0.12**	100.0
nutrients	t	398.240	466.93	**479.4**	2.7
other	t	0.0	0.0	**0.26**	-
ELECTRICITY FOR WASTEWATER (*)					
total electricity for wastewater	**GWh**	**31.20**	**31.69**	**31.83**	**0.4**
electricity for purification	*GWh*	*25.33*	*24.92*	*26.12*	*4.8*
electricity for lifting stations	*GWh*	*5.60*	*6.44*	*5.53*	*-14.1*
electricity for offices	*GWh*	*0.27*	*0.33*	*0.18*	*-45.5*
OTHER CONSUMPTION					
other consumption drinking water	**m^3**	**260,118**	**287,554**	**266,242**	**-7.4**
drinking water consumed for civil water use (the datum concerns consumption for offices, outside showers etc.) (**)	*m^3*	*40,381*	*59,862*	*46,829*	*-21.8*
drinking water consumed for process use (washing machinery and bays, etc.) (***)	*m^3*	*219,737*	*219,413*	*219,413*	-

(*) Electricity data 2017 are estimated for December.

(**) The value is partially estimated.

(***) The value for 2016 was adjusted; the value for 2017, as not available at the time of publication, was estimated as equal to the value for 2016.

WASTE	u. m.	2015	2016	2017	Δ% 2017/2016
SPECIFIC WASTE FROM WASTEWATER PURIFICATION					
treatment sludge	t	20,834.21	21,125.40	21,577.260	2.14
sand and sediment from treatment	t	3,415.77	2,894.490	2,308.86	-20.23
WASTE PURSUANT TO LEGISLATIVE DECREE NO. 152/06 EXCLUDING SLUDGE AND SAND					
hazardous waste	t	11.64	10.38	30.15	190.5
non-hazardous waste	t	50,411.93	43,919.86	49,410.19	12.5

We point out that Acque **reuses/recycles part of the water** for washing equipment and sludge dehydration (belt presses), installed in the main purification plants, for an estimated volume equal to about 345,604 m^3 in 2017.

TOTAL COD IN INPUT AND OUTPUT (all plants) (2015-2017)

(t/year)	2015	2016	2017
COD_{out}	1,757	2,380	1,603
COD_{in}	21,659	24,167	22,789

OUTPUT PARAMETERS FOR THE MAIN TREATMENT PLANTS MANAGED BY ACQUE SPA (*) (2015-2017)

parameter	average of values (mg/l) 2015	average of values (mg/l) 2016	average of values (mg/l) 2017
BOD_5	4.7	8.4	5.3
COD	36.0	43.3	34.3
SST	8.7	10.3	7.6
NH_4^+	4.8	6.3	4.7
phosphorus	2.1	2.5	2.4

(*) Plants with potential ≥ 10,000 AE.

PURIFICATION EFFICIENCY OF THE MAIN PURIFICATION PLANTS MANAGED BY ACQUE SPA (*) (2015-2017)

parameter	average of values (%) 2015	average of values (%) 2016	average of values (%) 2017
$100x(COD_{in} - COD_{out})/COD_{in}$	90.8	90.1	**93.5**
$100x(SST_{in} - SST_{out})/SST_{in}$	93.5	95.4	**97.2**
$100x(NH_4^+{}_{in} - NH_4^+{}_{out})/ NH_4^+{}_{in}$	87.4	84.4	**87.4**
$100x(PO_4^{-3}{}_{in} - PO_4^{-3}{}_{out})/ PO_4^{-3}{}_{in}$	62.6	68.4	**74.6**

(*) Plants with potential ≥ 10,000 AE.

Acque has brought about energy efficiency interventions, predicting the savings indicated in the table. Effective savings are yet to be accounted for.

ENERGY EFFICIENCY ACQUE SPA (2015-2017)

action	energy saving achieved 2015(*) (kWh)	energy saving achieved 2016 (kWh)	energy saving achieved 2017 (kWh)
Pagnana plant - lifting	40,000	40,000	40,000
Cambiano plant - lifting	-	5,000	5,000
Le Lame plant - replacement of aeration system	-	30,000	45,000
S. Jacopo plant - replacement of aeration system	-	40,000	40,000
inter-communal purification plant – automation and increased energy efficiency	500,000	550,000	550,000
Minor plants– increased efficiency and lifting	-	6,000	6,000

(*) The figures for 2015 have been adjusted.

OVERSEAS ACTIVITIES

For years Acea has been operating abroad in the water services sector in Peru, Honduras and the Dominican Republic, serving a total of **approximately 3 million people**.
Overseas activities have a limited incidence from an economic and financial viewpoint, in terms of consolidation percentage, but a brief description of them is given here because of their social importance. The operations are carried out by companies created through **partnerships with local and international stakeholders**. The objective is to improve the service, especially as regards **technical and management aspects**. This is possible thanks to **staff training** and the **transfer of know-how** to local businesses.

CONSORCIO AGUA AZUL SA

The Consorcio Agua Azul was set up with the mission to produce drinking water for the local public-owned water company, SEDAPAL (Drinking water and sewerage service of Lima). The Consortium constructed the infrastructures required to satisfy part of the drinking water needs of the **northern areas of Lima, Peru**, using the surface and underground waters of the river Chillon and will be responsible for their management until 2027, when it will be transferred to the State.

47.8 Mm^3 of drinking water was produced in 2017, 19% more than 2016.

CONSORCIO AGUA AZUL SA - MAIN COMPANY AND OPERATING DATA

Country (area)	Perù (Lima, northern area - Cono Norte)
inhabitants served	839,000
customer	Sedapal (Se Drinking water and sewerage service of Lima. State owned)
source of financing	own capital and bonds issued on the Peruvian market
contract duration	07/04/2000 – 18/06/2027
scope of the project	BOT (Build-Operate-Transfer) project for the construction and management of the drinking water supply system using the waters of the river Chillon and the underlying source of ground water
stakeholders	Acea SpA 25.5%, Impregilo International Infrastructure N.V. 25,5%, Marubeni Co 29%, Inversiones Liquidas S.A.C 20%
no. of employees at 31/12/2017	33
turnover (in thousands of Euros)	12,511

Many activities took place over the year. Continuing into 2017 was the **training programme** on **environmental topics** and **safety in the workplace** for all internal staff and the staff of contractors. **2,863 hours of training were supplied**. Training exercises were coordinated with the Carabyllo Fire Brigade; its help was repaid by funding the improvement of its structures dedicated to training staff.
Of particular importance are the training courses for staff in the irrigation commission on matters concerning the use of fertilisers and **conversion to biological agriculture**. After six years' work, in February 2017 it was presented and promoted the board of directors of the **Association of ecological products** of the valley of Chillón, which is the first of its kind in the entire area.
One again, employees were given a **questionnaire on the working climate to be filled in anonymously**; a satisfaction level of 100% was recorded.
As regards **preventive health**, a campaign was carried out of vaccinations against influenza, also extended to employees' families, on a voluntary basis.
In 2017 **580 plant visits** were organised involving students, delegations from companies in the sector and regional institutions.
As in every year, regional courses in the design and functioning of rapid filtering plants were carried out in March and November at the facilities of the Consortium, organised by the Faculty of Engineering of the National University of Peru. Graduates from several Latin American countries participated in these courses.
Again in 2017, the Consortium **hosted high school and university students and new graduates, offering them a period of internship**. In 2017, from the viewpoint of corporate social responsibility, the Consorcio Agua Azul **confirmed its support to State entities** (such as the State Police, primary schools, the Ministry of Agriculture and the Ministry of Health), **non-profit organisations** (such as associations for the rehabilitation of drug addicts) and **consumer associations**.
Teaching materials were distributed to primary schools and kindergartens, in greater quantities than in previous years (**1,641 kit**, versus 1,513 distributed in 2016), in order to combat the widespread phenomenon of leaving school. This year too, distributed backpacks were made entirely of **recycled plastic materials** and distinguished by printed phrases **encouraging the proper use of water resources and the respect of the environment**.
At Christmas time donations included:

- 1,926 toys to the children in schools in the outskirts, the children of members of the law enforcement agencies in the area and employees of the Municipal authorities,
- Restaurant vouchers to all the employees of the Consortium to have lunch with their families.

The Peruvian certification authority SGS renewed the certification of the **Integrated Quality and Environment System**, according to **UNI EN 9001:2008 and 14001:2004** standards, issuing the relevant certificates, valid until 2018. The certified and updated management system implemented enables the optimisation of the production processes and simultaneously the significant reduction of the environmental impact, through actions aimed at energy saving and reducing the use of paper. During the year, the company satisfied the regulatory requirements concerning workers' rights and health and safety in the workplace.

AGUAS DE SAN PEDRO

Aguas de San Pedro ASP is the holder of a thirty-year contract for the management of the integrated water service in the city of San Pedro Sula in Honduras. The company started a programme of interventions for the enhancement, treatment and improvement of the water service and sewerage network covering the entire city.
In 2017, 118,686, users were served and 74% of them were supplied with meters. The coverage of the drinking water service remains at 99% of the population, and for the sewerage service 83%.
The total water production in 2017 was approximately 81 Mm^3.

AGUAS DE SAN PEDRO SA – MAIN COMPANY AND OPERATING DATA

Country (area)	Honduras (San Pedro Sula)
inhabitants served	755,000
customer	municipal administration
source of financing	own capital and loans from merchant banks
contract duration	01/02/2001 – 01/02/2031
scope of the project	concession of the integrated water service in the city of San Pedro Sula
stakeholders	Acea SpA 60.65%, IREN SpA 39.35%
no. of employees at 31/12/2017	425
turnover (in in thousands of Euros)	28,355

In 2017, the Company continued its **technical assistance programme for rural communities** and confirmed its commitment to supporting environmental protection initiatives, continuing the conservation programme in the natural reserve of El Merendon, declared as a protected area for water production in San Pedro Sula.

The initiatives include various measures implemented previously in 2016, amongst which:

- the "Un millon de Arboles para el Merendon" (One million trees for the Merendon) **reforestation** project: 101,738 fruit trees and others for producing wood in the affected areas were planted, reaching a total of 681,738 plants since the start of the project;
- the **environmental training**, which included 11 training courses totally 50 hours, aimed at agricultural producers benefitting from the reforestation project, to which 375 people participated;
- fire prevention, which brought about various land protection campaigns, in particular in 2017 13 fires were tackled which destroyed 51 hectares of land;
- social assistance of various kinds and technical assistance for the rural communities of Merendón.

In particular the programme for **technical assistance to the rural communities** involved training activities for the community leaders, activities on the **management and maintenance of water systems**, with the objective of enhancing their knowledge on the quality of water, the management and maintenance of the systems and the basic principles of hydraulics. In details, hygiene conditions were improved for 1,000 dwellings in districts of Manchaguala, El Palmar and Rio Frio.

Also continuing in 2017 was the implementation of the **plan for health in the workplace**, as required by the *Sistema Médico de Empresa EMS-IHSS-ASP*, with the realisation of **health campaigns** (conferences on topics such as female wellbeing, nutrition and leading a more healthy life); sports activities were also organised for the employees and, lastly, **campaigns for vaccination** against influenza, hepatitis A and B and tetanus and medical check-ups to diagnose osteoporosis, in addition to ophthalmology and dentistry check-ups.
The transition of the quality management system to the requirements of versions 2015 of standard ISO 9001 was realised in 2017. Certification of the management system according to standard ISO 17025:2005 was confirmed by the certification authority EMA (Entitad Mexicana de Accreditación) after the audit in June.

ACEA DOMINICANA SA

Acea Dominicana deals with the commercial management of the water service in the **northern and eastern areas of Santo Domingo**, in the **Dominican Republic**. The activities include the management of customer relations, the billing cycle and cost estimates, the installation of new meters and directing the works for new connections. The project is one of the first experiments of private participation in water services in the Dominican Republic.
The framework of a contractual addendum already signed by Acea Dominicana and Corporacion del Acueducto y Alcantarillado De Santo Domingo (CAASD), which extended the contract duration until 30 September 2023, also includes the financing, supply and installation of 30,000 meters for new users and the replacement of 10,000 meters for existing users; 2,000 of which were installed in 2017. Apart from the foregoing, the company also carries out maintenance on the entire meter park.

ACEA DOMINICANA SA – MAIN COMPANY AND OPERATING DATA

Country (area)	Repubblica Dominicana (Santo Domingo, North and East areas)
inhabitants served	1,500,000
customer	Corporación del Acueducto y Alcantarillado de Santo Domingo (CAASD)
contract duration	01.10.2003 – 30.09.2023
scope of the project	Commercial management of the water service
stakeholders	Acea SpA 100%
no. of employees at 31/12/2017	179
turnover (in in thousands of Euros)	4,080

The promotion of the "Plan Deuda Cero" (Zero debt plan) aimed at users in arrears with payments continued in 2017 in the poorer areas of the capital and in Boca Chica. This year too, at media level, such activity was supported by interviews and explorations in some of the main Dominican newspapers and television channels.
Acea Dominican also continued its commitment towards **awareness campaigns** aimed at the inhabitants of the areas served: the campaigns are carried out periodically with the involvement of employees who, in weekly meetings with the local representatives, contribute towards spreading information on the **proper use of water resources** and on the importance of complying with the economic **conditions of the contract**, in order to guarantee that the local water company has the financial tools needed to improve the quality of the service supplied.

Various activities for improving and preserving the **Quality management system** continued, implemented and certified according to standard **ISO 9001:2008**.
Moreover, the development of software and applications continued, aimed at improving operational efficiency in the land and facilitated bill payment options for clients. As regards the management of human resources, Acea Dominicana, in fulfilment of the regulations provided by the Dominican law on Employment and Social Rights, has always adopted **corporate policies aimed at safeguarding the rights and dignity of its workers**. Consistently with this approach, the private health insurance policy has been renewed and a severance fund has been allocated, neither of which are compulsory in the Dominican Republic.

GRI STANDARD CONTENT INDEX: REPORTING PRINCIPLES, GENERAL STANDARDS AND MATERIAL SPECIFIC STANDARDS

The Sustainability Report was drawn up in accordance **with GRI Standards (ed. 2016): comprehensive**[112] **option**, as shown below in the GRI Content Index which includes:

- reference to Reporting Principles (GRI 101 - Foundation 2016);
- the **definition of the 56 general standards** (GRI 102: General Disclosure 2016) **and 25 specific topics** ("Topic-specific Standards": 200-Economic, 300-Environmental, 400-Social) **deemed material** and **relevant indicators**, with **the indication of sections and pages of the document** where they can be found – **or responses to the indicators** – and **reporting of any omissions or "non-materiality" of certain indicators** included in material topics;
- **the extension of the "materiality" of each topic (specific standards), in other words its significance within the organisation** (Group or companies traceable to specific business sectors) **or outside of it** (for example supply chain, community).

Lastly, the right-hand columns of the Content Index give the main compliances with the topics provided under Legislative Decree no. 254/2016.

STANDARD GRI CONTENT INDEX		
GRI Standard	definition of known GRI standards (responses or report of omissions or non-materiality) sections and pages of reference	Compliance with Legilsative Decree 254/2016
GRI 101: Foundation 2016 (Reporting Principles)		
GENERAL DISCLOSURES		
	ORGANISATION PROFILE	
GRI 102: General Disclosures 2016	**102-1 Name of the organisation** Acea SpA, *Corporate identity* page 24.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-2 Activities, brands, products, and services. *Corporate identity* page 24 et seq., 25 chart no. 2.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-3 Location of headquarters. Piazzale Ostiense 2, 00154 Rome	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-4 Localisation of operations (Number of countries where the organisation operates, and names of countries where it has significant operations and/or that are specifically relevant to the sustainability topics covered in the report). *Corporate identity* pages. 24 s.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-5 Ownership and legal form. *Corporate identity* page 26.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-6 Markets served (including geographic locations, sectors served and types of customers and beneficiaries). *Corporate identity* pages. 24 s., 30; *Relations with stakeholders* pages 62. et seq. 68 table no. 11.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-7 Scale of the organisation (including: number of employees; net sales - for private sector organisations - or net revenues -for public sector organisations; total capitalization broken down in terms of debt and equity; quantity of products or services provided). *Corporate identity* pages 24, table no 6, 30 table no. 7; *Relations with stakeholders* pages 123, table no. 35, 144.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-8 Information on employees and other workers (total number of employees by employment type and gender; employment contract by region, etc.; whether a significant portion of the organisation's activities are performed by workers who are not employees. If applicable, a description of the nature and scale of work performed). *Relations with stakeholders* pages 121 et seq., 124 et seq., 131.	**Art. 3 paragraph 2, letter d):** social aspects and aspects related to staff management
	102-9 Description of organisation's supply chain. *Relations with stakeholders* pages 116 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model

[112] The definition of the general and specific standard elements have been translated from the English version of the *Consolidated set of GRI Sustainability reporting standards 2016, see the original edition*.

GRI 102: General Disclosures 2016	**102-10 Significant changes to the organisation's size, structure, ownership, or supply chain (including: changes in the location of, or changes in operations, including facility openings, closings and expansions; changes in the share capital structure and other capital formation, maintenance and alteration operations; change in the location of suppliers, the structure of the supply chain, or relationships with suppliers etc.).** *Corporate identity* page 26; *Relations with stakeholders* pages 117 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-11 Precautionary Principle or approach (whether and how the organisation applies the Precautionary Principle or approach. *Corporate identity* pages. 53 et seq., 57 and table no. 8; *Relations with stakeholders* pages 151 et seq.; *Relations with the environment* page 179.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-12 External initiatives (a list of externally-developed economic, environmental and social charters, principles, or other initiatives to which the organisation subscribes, or which it endorses.). *Membership to the United Nations Global Compact* pages 19 et seq.,17; *Corporate identity* pages 33, 35, 57; *Relations with stakeholders* pages 115, 116, 132, 150; *Relations with the environment* page 157.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-13 Membership of associations (the reporting should include memberships maintained at the organisational level in associations or organisations in which it holds a position on the governance body, participates in projects or committees, provides substantive funding beyond routine membership dues, or views its membership as strategic). *Relations with stakeholders* page 149.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	STRATEGY	
	102-14 Statement from senior decision-maker (such as CEO, chair, or equivalent senior position) about the relevance of sustainability to the organisation and its strategy for addressing sustainability. *Letter to stakeholders* pages. 6-7, *Corporate identity* pages. 33 et seq., 38 et seq., 56.	**Art. 3 paragraph 7:** The responsibility for ensuring that the report is in [...] compliance is the responsibility of the directors
	102-15 Description of key impacts, risks, and opportunities. *Corporate identity* pages. 29 et seq., 31, 33, 35, 38 et seq., 53, 55, 56 et seq. *Relations with stakeholders* pages 147, 148, 151.	**Art. 3 paragraph 1, letter c):** the main risks, generated or incurred **Art. 3 paragraph 2, letter c):** the impact [...] on the environment as well as on health and safety
	ETHICS AND INTEGRITY	
	102-16 Description of the organisation's values, principles, standards, and norms of behaviour *Corporate identity* pages. 33 et seq., 50 et seq., 56, 62 chart no. 16; *Relations with stakeholders* page 115.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-17 Mechanisms for advice and concerns about ethics (description of internal and external mechanisms for seeking advice about ethical and lawful behaviour, and organisational integrity; reporting concerns about unethical or unlawful behaviour, and organisational integrity etc.). *Corporate identity* pages 50, 55.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model **Art. 3, paragraph 2, letter e):** respect for human rights, the measures taken to prevent violations, as well as actions taken to prevent discriminatory attitudes and actions
	GOVERNANCE	
	102-18 Governance structure of the organisation, including committees of the highest governance body. Committees responsible for decision-making on economic, environmental and social topics. *Corporate identity* pages. 50 et seq., 52.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-19 Processes for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees. The Board of Directors confers management delegations to the Chief Executive Officer, who, in the framework f the corporate macro-structure resolved by the Board itself, confers powers and delegations to the management, in compliance with the missions and responsibilities of the various structures. Normally, the process for any type of delegation (and therefore also for economic, environmental and social aspects) occurs through the analysis of the need/ requirement for a power to be attributed.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model

	102-20 Executive-level responsibility for economic, environmental, and social topics (whether the organisation has appointed an executive-level position or positions with responsibility for economic, environmental and social topics; whether post holders report directly to the highest governance body. Within the staff of the Chairman, delegated for supervising topics concerning the environmental and social impact of the Group, operates the Institutional Affairs Division of Acea SpA - within the which the Unit is allocated - which has among its duties the coordination and development of topics concerning the sustainability of the Group's activities and processes. The person responsible for this Unit is the Acea CSR Manager.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-21 Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics. If consultation is delegated and how the resulting feedback is provided to the highest governance body. During the course of the year, management was asked to attend Board meetings, making a specific informative and cognitive contribution to the meetings A meeting of the Ethics and Sustainability Committee was specifically dedicated to a comparison with the references of the Integrated Governance Index in which emerging guidelines on the matter of integrating sustainability in the corporate governance systems were explained and discussed. The BoD also carried out an induction session con with external experts, also in compliance with the requirements of the Self-Governance Code, regarding sustainability and business. *Corporate identity* pages. 33 et seq., 50 et seq., 53; *Relations with stakeholders* page 144.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-22 Composition of the highest governance body and its committees (executive or non-executive, independence, gender, competencies relating to economic, environmental, and social topics etc.). *Corporate identity* page 51 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-23 Chair of the highest governance body (the organisation shall report whether the Chair is also an executive officer in the organisation, his or her function within the organisation's management and the reasons for this arrangement). *Corporate identity* pages 51 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
GRI 102: General Disclosures 2016	**102-24 Nomination and selection processes for the highest governance body and its committees (criteria used for nominating and selecting highest governance body members, including whether and how diversity, independence, expertise and experience relating to economic, environmental and social topics are considered, stakeholders, including shareholders, are involved).** In the composition of its corporate bodies, Acea ensures a balanced representation of gender, provided under law no. 120/2011, transposed into its articles of association in the same way as it guarantees the presence of independents, governed under such articles of association and the law in force. Diversity of gender in the governing body and Committees constitutes a particularly important element in relation to both mitigation of the "single mode of thought" and the different way in which men and women exercise their leadership. Shareholders are involved in these selection processes and in compliance with the recommendations of the Self-Governance Code, they are steered in the choice of candidates to put forward in the lists of orientation drawn up by the Board of Directors of Acea, subject to the opinion of the Appointments Committee and considering the outcomes of self-assessment and the dimension and composition of the governing body. *Corporate identity* pages 51 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-25 Processes for the highest governance body to ensure conflicts of interest are avoided and managed. The risk of conflict of interest in Acea is monitored thanks to internal corporate governance systems and procedures (Management, organisation and control model, Code of Ethics, Related Parties Transactions procedure, independent Directors). These tools are used to intervene in the various frameworks within which a conflict of interest may arise: in relations between controlling and minority stakeholders, between Acea and Related Parties and between Acea and Public Administrations. *Corporate identity* pages. 50 et seq., 52.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-26 Highest governance body's and senior executives' roles in the development, approval, and updating of the organisation's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental, and social topics *Disclosing sustainability: methodological note* page 12; *Corporate identity* pages. 33 et seq., 36 et seq., 50, 52, 56.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model

GRI 102: General Disclosures 2016	**102- 27 Measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics.** *Disclosing sustainability: methodological note* page 12; *Corporate identity* pages 33 et seq., 50, 51.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-28 Processes for evaluating the highest governance body's performance with respect to governance of economic, environmental and social topics. The non executive directors receive a fixed remuneration, determined by the Shareholders' Meeting, commensurate to the commitment required of them. *Corporate identity* pages 50, 51, 52, 57; *Relations with stakeholders* page 140.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-29 Highest governance body's role in identifying and managing economic, environmental, and social topics and their impacts, risks, and opportunities – including its role in the implementation of due diligence processes. *Disclosing sustainability: methodological note* pag. 12; *Corporate identity* pages. 38 et seq., 50, 51 et seq., 56	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-30 Highest governance body's role in reviewing the effectiveness of the organisation's risk management processes for economic, environmental and social topics. *Disclosing sustainability: methodological note* page 12, *Corporate identity* pages. 38 et seq., 48 et seq., 50, 52, et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-31 Frequency of the highest governance body's review of economic, environmental, and social topics and their impacts, risks, and opportunities. *Disclosing sustainability: methodological note* page 12; *Corporate identity* pages. 38 et seq., 50, 56.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-32 The highest committee or position that formally reviews and approves the organisation's sustainability report and ensures that all material Aspects are covered. *Disclosing sustainability: methodological note* page 12; *Corporate identity* page 52.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-33 Processes for communicating critical concerns to the highest governance body. The Board of Directors (BoD) receives constant information on potentially critical situations, primarily through the work carried out by the Control and Risk Committee, to which the manager of the Audit Function functionally reports, who interacts freely with the Board of Directors. The activities carried out and the findings of the Supervisory Boards (pursuant to Legislative Decree no. 231/01) which could lead to the emergence of a risk of responsibility for the company are the subject of flows of information to the BoD. The CEO, also in his role as Director in charge of the Internal Control and Risk Management System, constantly provides information to the Board of Directors concerning operating performance and the effective existence of potentially critical situations. *Corporate identity* pages 53, 55, 57.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-34 Nature and total number of critical concerns that were communicated to the highest governance body; mechanism(s) used to address and resolve critical concerns. *Corporate identity* pages 55, 56, 59.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-35 Remuneration policies for the highest governance body and senior executives (fixed pay and variable pay, sign-on bonuses or recruitment incentive payments, termination payments). How performance criteria in the remuneration policies relate to the highest governance body's and senior executives' objectives for economic, environmental, and social topics. We point out that in Acea, for the Top Management, Managers having strategic responsibility and managerial roles with greater impact on Group business, the clawback clause is applied - a right to ask the return of variable components in remuneration, in the short and long term if such components were paid on the basis of conduct of gross negligence or wilful misconduct. No agreements are in place which provide fixed indemnities or clauses aimed at safeguarding Group Directors if the working relationship is terminating, for this mater reference is made to the institutions under the Collective Labour Agreement for Directors of Service Companies of Public Utility. Within the Catalogue of Group Objectives, which provides a set of indicators for assigning to Management performance targets, the contexts in which to retrace the identified objectives are defined amongst which those associated to the treatment/ remedy of non-conformities for Quality the Environment Safety and Energy. *Corporate identity* pages 50 et seq., 53; *Relations with stakeholders* page 140.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-36 Processes for determining remuneration; whether remuneration consultants are involved in determining remuneration and whether they are independent of management. No external subjects to the company were involved in determining the remuneration Policy.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model

	102-37 Stakeholders' involvement in remuneration. *Corporate identity* page 53.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-38 Ratio of the annual total compensation for the organisation's highest-paid individual in each country of significant operations to the median annual total compensation for all employees (excluding the highest-paid individual) in the same country. The ratio between remuneration for the highest-paid individual and average employee for 2017 is given by retributive multiple 7.3, which is compared to a mean value of 14.8 of peer companies. See also Remuneration Report 2017, available from the Acea website (www.acea.it) *Corporate identity* page 53.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-39 Report the ratio of percentage increase in annual total compensation for the organisation's highest-paid individual to the median percentage increase in annual total compensation for all employees (excluding the highest-paid individual) in the same country. The company chose to only provide the datum concerning the ratio between the remuneration of the highest-paid individual and the median remuneration of the employees, in line with the Glass Lewis European guidelines, one of the main proxy advisors.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	STAKEHOLDER ENGAGEMENT	
	102-40 List of stakeholder groups engaged by the organisation. *Disclosing sustainability: methodological note* page 13; *Corporate identity* pages 58 et seq.; *Relations with stakeholders* pages 69 et seq., 81 et seq., 85 et seq., 90 et seq., 101 et seq., 104 et seq., 108 et seq., 111 et seq., 119 et seq., 122, 131, 133, 135, 137, 139, 145, 146 et seq., 149 et seq.; *Relations with the environment* page 166.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-41 Percentage of employees covered by collective bargaining agreements. *Relations with stakeholders* page 131.	**Art. 3 paragraph 2, letter d):** aspetti social aspects and aspects related to staff management
GRI 102: General Disclosures 2016	**102-42 Basis for identification and selection of stakeholders with whom to engage.** *Disclosing sustainability : methodological note* page 13; *Corporate identity* pages 58 et seq.; *Relations with stakeholders* pages 69 et seq. 82 et seq., 85 , 88 et seq., 91, 101 et seq., 104 et seq., 108 et seq., 111 et seq., 119 et seq., 122 et seq., 131, 133, 135, 137, 139, 143, 145, 146 et seq., 149 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-43 Approach to stakeholder engagement (including frequency of engagement by type and by stakeholder group and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process). *Disclosing sustainability: methodological note* page 13; *Corporate identity* pages. 58 et seq.; *Relations with stakeholders* pages 69 et seq., 81 et seq., 85, 88 et seq., 90 et seq., 101 et seq., 104 et seq., 108 et seq., 111 et seq., 119 et seq., 122, 131, 133, 135 et seq., 139 et seq., 141 et seq., 143, 145 et seq., 148 et seq., 150 et seq.; *Relations with the environment* page 166.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	102-44 Key topics and concerns that have been raised through stakeholder engagement (including how the organisation has responded to those key topics and concerns, including through its reporting and the stakeholder groups, etc.). *Disclosing sustainability: methodological note* page 13; *Corporate identity* pages. 58 et seq., *Relations with stakeholders* pages 69 et seq. Table no. 12, 82 et seq., 85, 88 et seq., 90 et seq., 101 et seq., 104 et seq., 112, 119 et seq., 122, 131 et seq., 135, 145, 147 et seq., 150 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model
	REPORTING PRACTICE	
	102-45 List of all entities included in the organisation's consolidated financial statements. Specify whether any entity included in the organisation's consolidated financial statements is not covered by the report. The indicator is also shown in the report each time the reference boundary of the disclosure changes. Such shift in some cases is simply to be correlated to the various business sectors (and related pertaining companies) accounted for, in others it must be related to the centralised management of some data which, by virtue of the activities managed under service, does not include the whole accounting scope. *Disclosing sustainability: methodological note*, page 16; *Relations with stakeholders* pages 66, 116; *Relations with the environment* pages 160, 165, 168; *Sustainability Report* page 231.	**Art. 4 paragraph 1:** the consolidated declaration includes the data of the parent company, of its fully consolidated subsidiaries

GRI 102: General Disclosures 2016	**102-46 Process for defining the report content and the topic Boundaries (including an explanation of how the organisation has implemented the Reporting Principles for defining report content).** *Disclosing sustainability: methodological note* pages 13 et seq., 15 et seq., 18 et seq.: *Corporate identity* page 31 et seq.	**Art. 3 paragraph 1, letter a):** the corporate management and organisation model **Art. 4 paragraph 1:** necessary measure to ensure the understanding of the group's activity, its progress, its results and the impact produced by it
	102-47 List of the material aspects identified in the process for defining report content. *Disclosing sustainability: methodological note*, pages 13 et seq., 15, table no. 1 ; *GRI Standards Content Index* pages 206 et seq.	**Art. 4 paragraph 1:** necessary measure to ensure the understanding of the group's activity, its progress, its results and the impact produced by it
	102-48 Effect of any restatements of information given in previous reports, and the reasons for such restatements (mergers or acquisitions, change of base years or periods, nature of business, measurement methods). Any recalculations or aggregations implying changes respect to that published in 2016 are adequately marked and grounded in the report. *Disclosing sustainability: methodological note*, page 16; *Relations with stakeholders* pages 117 note 78, 118, 124 note 85, 135; *Relations with the environment* page 181.	**Art. 3 paragraph 3:** the information [...] is provided with a comparison in relation to those provided in previous years
	102-49 Significant changes respect to the previous reporting period in the list of material topics and topic Boundaries. *Disclosing sustainability: methodological note*, pages 13 et seq., 15 et seq. *Environmental Accounts* page 236.	**Art. 3 paragraph 3:** the information [...] is provided with a comparison in relation to those provided in previous years
	102-50 Reporting period for the information provided (for example, the fiscal or calendar year). *Disclosing sustainability: methodological note* page 12.	**Art. 2 paragraph 1:** public interest entities draw up a declaration for each financial year **Art. 3 paragraph 3:** the information [...] is provided with a comparison in relation to those provided in previous years
	102-51 Date of the most recent previous report. *Disclosing sustainability: methodological note* page 12.	**n/a**
	102-52 Reporting cycle (for example, annual or biennial). *Disclosing sustainability: methodological note* page 12.	**Art. 2 paragraph 1:** public interest entities draw up a declaration for each financial year
	102-53 Contact point for questions regarding the report or its contents. *Disclosing sustainability: methodological note* page 18.	**n/a**
	102-54 Claims of reporting in accordance with the GRI Standards (either: i. *"This report has been prepared in accordance with the GRI Standards: Core option"*, ii. *"This report has been prepared in accordance with the GRI Standards: Comprehensive option"*). *Disclosing sustainability: methodological note* page 12 and *GRI Standard Content Index Standard* pages 206 et seq.	**Art. 3 paragraph 3:** reporting standard used
	102-55 GRI content index, which specifies each of the GRI Standards used and lists all disclosures included in the report (for each disclosure, the content index shall include: the number of the disclosure, the page number(s) or URL(s) where the information can be found, if applicable, and where permitted, the reason(s) for omission when a required disclosure cannot be made, etc); include any additional material topics reported on which are not covered by the GRI Standards. *GRI Standard Content Index Standard* pages 206 et seq.	**Art. 3 paragraph 3:** reporting standard used
	102-56 External assurance (the reporting organisation shall report a description of the organisation's policy and current practice with regard to seeking external assurance for the report; a reference to the external assurance report; the relationship between the organisation and the assurance provider; whether and how the highest governance body or senior executives are involved in seeking external assurance for the organisation's sustainability report). *Disclosing sustainability: methodological note* page 12 and *Opinion Letter* page 265.	**Art. 3 paragraph 10:** verification [..] of the declaration of a non-financial nature

MATERIAL TOPIC-SPECIFIC STANDARDS		
GRI 200: ECONOMIC TOPICS 2016		
TOPIC	ECONOMIC PERFORMANCE	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* pages 29 et seq., 33. **Topic Boundary: Acea Group**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* pages 29 et seq., 33.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* pages 29 et seq., 33.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 201: Economic performance in 2016	**201-1 Direct economic value generated and distributed (including revenues, operating costs, employee wages and benefits, payments to providers of capital, payments to government and community investments, economic value retained).** *Corporate identity* pages 30 table no. 7, 58, 63 et seq.; *Relations with stakeholders* pages 129, 144, 146.	**Art. 3 paragraph 1, letter d):** social aspects and aspects relating to staff management
	201-2 Financial implications and other risks and opportunities due to climate change *Corporate identity* pages 30, 35, 38 et seq., *Relations with the environment* pages 157, 175.	**Art. 3 paragraph 1, letter c):** the impact [...] on the environment
	201-3 Defined benefit plan obligations and other retirement plans. *Relations with stakeholders* pages 129, 130 table no. 39.	**Art. 3 paragraph 1, letter d):** social aspects and aspects relating to staff management
	201-4 Financial assistance received from government. *Corporate identity* page 63 nota 20.	**n/a**
TOPIC	INDIRECT ECONOMIC IMPACTS	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* pages 58 et seq.; *Relations with stakeholders* pages 74, 111, 116. **Topic Boundary: main Group companies; local community; suppliers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* pages 58 et seq.; *Relations with stakeholders* pages 74, 111, 116.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* pages 59 et seq.; *Relations with stakeholders* pages 74, 116.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 203: Indirect economic impacts 2016	**203-1 Infrastructure investments and services supported (the organisation shall report: the extent of development of significant infrastructure investments; current or expected impacts oncommunities, including positive and negative impacts where relevant; whether these investments and services are commercial, in-kind, or pro bono engagements, etc.).** *Corporate identity* pages 58 et seq.; *Relations with stakeholders* pages 74 et seq., 81 et seq., 83 et seq., 85 et seq., 88 et seq., 92, 111, 150 chart no. 41.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment and on health and safety
	203-2 Significant indirect economic impacts (examples of significant identified indirect economic impacts of the organisation, including positive and negative impacts, etc.). *Corporate identity* pages 58 et seq. ; *Relations with stakeholders* pages 67, 74 et seq., 81 et seq., 83 et seq., 86, 88, 111, 114, 116 et seq., 118 table no. 33 e table no. 34 ; *Relations with the environment* page 175.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment and on health and safety

TOPIC	PROCUREMENT PRACTICES	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 114 et seq. **Topic Boundary: main Group companies; suppliers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 114 et seq.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 114 et seq.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 204: Procurement practices 2016	**204-1 Proportion of spending on local suppliers.** No specific preferential strategy is foreseen for local suppliers, even though, particularly for provisioning works, the prevalence of local suppliers comes about naturally. *Relations with stakeholders* pages 116 et seq., 118 table no. 34	**Art. 3 paragraph 1, letter b):** non-financial key performance indicators
TOPIC	ANTI-CORRUPTION	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* pages 54, 56; *Relations with stakeholders* pages 137 et seq. **Topic Boundary: Acea Group**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* pages 54, 56; *Relations with stakeholders* pages 137 et seq.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* pages 54, 56; *Relations with stakeholders* pages 137 et seq.	**Art. 3 paragraph 1, letter b):** the policies practised by the company [...] and the results achieved through them
GRI 205: Anti-corruption 2016	**205-1 Total number and percentage of operations assessed for risks related to corruption. Significant risks related to corruption identified through the risk assessment.** *Corporate identity* page 54.	**Art. 3 paragraph 1, letter c):** the main risks generated or suffered **Art. 3 paragraph 2, letter f):** fight against both active and passive corruption
	205-2 Communication and training about anti-corruption policies and procedures (total number and percentage of employees that the organisation's anti-corruption policies and procedures have been communicated to, etc.). The frontal training activity issued by the Internal Audit Function in 2017 continued, involving about 100 employees from Acea Energia and Acea8cento, having as subject matter Model 231 and the corporate Code of Ethics, with particular reference to the whistleblowing procedure and irregularities committed by employees, also traceable to specific cases of passive corruption. The top management of Acea SpA (Chairman, CEO and 2 members of the BoD) and about 100% of Managers holding positions in the BoD of the Companies within the *Sustainability Report* boundary have been trained on decree 231/01 – which contemplates corruption among the alleged crimes - and on the related normatives and internal policies put in place as safeguards (Code of Ethics and MOG 231). Furthermore, 1,220 employees and senior managers in the companies within the boundary undertook e-learning courses in the context of 231. Business partners entering into relations with Acea are required to be familiar with and sign the Acea Code of Ethics. *Relations with stakeholders* pages 137 et seq.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 2, letter f):** fight against both active and passive corruption
	205-3 Confirmed incidents of corruption and actions taken (total number and nature of confirmed incidents of corruption, etc.). No episodes of corruption were registered.	**Art. 3 paragraph 2, letter f):** fight against both active and passive corruption

TOPIC	ANTI-COMPETITIVE CONDUCT	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Relations with stakeholders* pages 115, 137. **Topic Boundary: Acea Group**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Relations with stakeholders* pages 115, 137.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** lthe policies applied by the company
	103-3 Evaluation of the management approach. *Relations with stakeholders* pages 115, 137.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 206: Anti-competitive conduct 2016	**206-1 Legal actions for anti-competitive behaviour, anti-trust, and monopoly practices (Number of legal actions pending or completed including any decisions or judgments).** *Relations with stakeholders* page 147.	**Art. 3 paragraph 1, letter b):** non-financial key performance indicators
GRI 300: ENVIRONMENTAL TOPICS 2016		
TOPIC	MATERIALS	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Environmental accounts* page 231. **Topic Boundary: main Group companies**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Environmental accounts* page 231	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Environmental accounts* page 231.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 301: Materials 2016	**301-1 Materials used by weight or volume (materials that are used to produce and package the organisation's primary products and services, by non-renewable and renewable materials used).** *Relations with the environment* page 177 and table no. 63; *Environmental accounts* pages 231, 239, 241, 242.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	301-2 Percentage of recycled input materials used to manufacture the organisation's primary products and services. **Non material:** in light of the materials used (301-1), which are mainly chemical, the indicator is not material.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	301-3 Percentage of reclaimed products and their packaging materials for each product category. **Non applicable.**	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
TOPIC	ENERGY	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* pages 31 et seq., 33, 56; *Relations with stakeholders* page 137; *Relations with the environment* page 161. **Topic Boundary: main Group companies; suppliers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* pages 31 et seq., 33, 56; *Relations with stakeholders* page 137; *Relations with the environment* page 161.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company

GRI 103: Management approach 2016	**103-3 Evaluation of the management approach.** *Corporate identity* pages 31 et seq., 33, 56; *Relations with stakeholders* page 137; *Relations with the environment* page 161.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 302: Energy 2016	**302-1 Energy consumption within the organization.** *Relations with stakeholders* page 106; *Relations with the environment page* 174.	**Art. 3 paragraph 2, letter a):** use of energy resources
	302-2 Energy consumption outside of the organization. *Relations with the environment* pages 175 et seq.	**Art. 3 paragraph 2, letter a):** use of energy resources
	302-3 Energy intensity. *Relations with the environment* pages 174, 175.	**Art. 3 paragraph 2, letter a):** use of energy resources
	302-4 Limitation of energy consumption. *Relations with stakeholders* page 106; *Relations with the environment* pages 175, 176 et seq.	**Art. 3 paragraph 2, letter a):** use of energy resources
	302-5 Reductions in energy requirements of products and services. **Non material:** The Group does not sell products or services for which the indicator could be considered as materials.	**Art. 3 paragraph 2, letter a):** use of energy resources
TOPIC	WATER	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* pages 31 et seq., 33, 56; *Relations with the environment* pages 158, 168. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* pages 31 et seq., 33, 56; *Relations with the environment* pages 158, 168.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* pages 31 et seq., 33, 56; *Relations with the environment* pages 158, 168.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 303: Water 2016	**303-1 Total volume of water withdrawn, with a breakdown by source.** The division by source of water withdrawals is illustrated by single operator in the *Environmental accounts*. Civil and process water consumption is shown in table no. 63 of *Relations with the environment*. *Relations with the environment* pages 177 et seq. e table no. 63; *Environmental accounts* pages 236, 237.	**Art. 3 paragraph 2, letter a):** the use of water resources
	303-2 Water sources significantlyaffected by withdrawal of water. *Relations with the environment* page 158.	**Art. 3 paragraph 2, letter a):** the use of water resources
	303-3 Percentage and total volume of water recycled and reused. *Relations with the environment* pages 177 et seq. e table no. 63.	**Art. 3 paragraph 2, letter a):** the use of water resources
TOPIC	BIODIVERSITY	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with the environment* page 157. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with the environment* page 157, 171.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with the environment* page 157.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 304: Biodiversity 2016	**304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.** *Relations with the environment* page 157 et seq.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment

GRI 304: Biodiversity 2016	**304-2 Significant impacts of activities, products, and services on biodiversity.** *Relations with the environment* pages 157 et seq., 159, 164.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	304-3 Habitats protected or restored. *Relations with the environment* pages 157 et seq., 159.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk. **Non material:** at the current time this item is not monitored, because in the territories in which the Group operates, we are not aware of the presence of species listed in the red list.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
TOPIC	ISSUES	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with the environment* pages 157, 179 et seq. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with the environment* pages 157, 179 et seq.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with the environment* pages 157, 179 et seq.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 305: Issues 2016	**305-1 Direct (Scope 1) GHG emissions.** The CO_2 biogenic was calculated for the Environment area and in 2017 it was equal to about 276,000 tonnes. *Relations with the environment* pages 180, 181 table no. 67; *Environmental accounts* pages 244, 246.	**Art. 3 paragraph 2, letter b):** greenhouse gas emissions
	305-2 Energy indirect (Scope 2) GHG emissions *Relations with the environment* pages 180, 181 table no. 67; *Environmental accounts* pages 244 et seq.	**Art. 3 paragraph 2, letter b):** greenhouse gas emissions
	305-3 Other indirect (Scope 3) GHG emissions. *Relations with the environment* page 180.	**Art. 3 paragraph 2, letter b):** greenhouse gas emissions
	305-4 GHG emissions intensity. *Relations with the environment* pages 181 e table no. 67.	**Art. 3 paragraph 2, letter b):** greenhouse gas emissions
	305-5 Reduction of GHG emissions as a direct result of reduction initiatives. All the initiatives are of a voluntary nature, with the exception of a regulatory obligation, which is not quantitative, concerning the change in voltage from 220 to 400V in the LV network: the impact of such intervention in 2017 was about a 2000 MWh reduction on the total (i.e. 720 tonnes of CO_2 out of the total 2,600 for Areti). *Relations with the environment* pages 164, 175, 176 s., 177 table no. 62, 181 table no. 67.	**Art. 3 paragraph 2, letter b):** greenhouse gas emissions
	305-6 Emissions of ozone-depleting substances (ODS). *Relations with the environment* page 181; *Environmental accounts* pages 239, 242.	**Art. 3 paragraph 2, letter b):** lgreenhouse gas emissions
	305-7 Nitrogen oxides (NO_x), sulphur oxides (SO_x), and other significant air emissions. *Relations with the environment* page 181 table no. 66; *Environmental accounts* pages 244 et seq.	**Art. 3 paragraph 2, letter b):** pollutant emissions into the atmosphere
TOPIC	EFFLUENTS AND WASTE	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with the environment* page 171, *Environmental accounts* page 231. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced

	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with the environment* page 171, *Environmental accounts* page 231.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with the environment* page 171, *Environmental accounts* page 231.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 306: The effluents and wastes 2016	**306-1 Water discharge by quality and destination.** The water used by Acea structures for "civil/hot water" undergoes the same standard purification process to which all town waste water is submitted. The environmental impact produced on the receiving body of water from the discharge of purified water from all the plants is not significant. *Environmental accounts* page 237.	**Art. 3 paragraph 2, letter a):** the use of water resources
	306-2 Waste by type and disposal method. The total hazardous waste products is equal to 80,576 t; the total non hazardous waste products is equal to 196,724 t (of which 135,741 is sludge, sand and gratings).a percentage of the hazardous and non hazardous waste sent for recycling is equal to 57%. Differentiated collection obtained about 1,030 tonnes of paper in 2017 (-7% compared to 2016) and 604 tonnes of plastic (-0.4% compared 2016). There is no detailed information at this time regarding the type of disposal inasmuch as code R13 of the normative in force on waste (most used by disposal operators) does not permit the identification thereof. *Relations with the environment* page 167, *Environmental accounts* pages 244, 245, 246.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	306-3 Total number and volumes of significant spillages. In 2017, there were no significant released into the environment of polluting substances such as mineral oil, fuels or chemical products.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	306-4 Weight of waste classified as hazardous according to the Basel Convention (Annexes I, II, III and VIII) that is not transported, imported, exported or processed and their percentage transported abroad. **Non-material:** flows of waste abroad are monitored for each company. No movement of waste abroad was recorded for 2017.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
	306-5 Identity, dimension, safeguarding and value of the biodiversity of the water bodies and related ecosystems struck significantly by drains and washing water of the organisation. No drain to report that significantly affects the habitats and biodiversity.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment
TOPIC	ENVIRONMENTAL COMPLIANCE	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* page 137; *Relations with the environment* page 159. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* page 137; *Relations with the environment* page 159.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* page 137; *Relations with the environment* page 159.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 307: Environmental Compliance 2016	**307-1 Non-compliance with environmental laws and regulations. Total monetary value of significant fines; total number of non-monetary sanctions, etc.** *Relations with stakeholders* page 147; *Relations with the environment* page 159.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them

TOPIC	SUPPLIER ENVIRONMENTAL ASSESSMENT	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* page 116; *Relations with the environment* pages *157, 175.* **Topic Boundary: main Group companies; suppliers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 116, 119, 120, 121; *Relations with the environment* pages 157, 175.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 115, 116, 121; *Relations with the environment* pages 157, 175.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 308: Supplier Environmental Assessment 2016	**308-1 Percentage of new suppliers that were screened using environmental criteria.** 100% of suppliers registered for qualification systems. By way of compulsory requirement for registration with the Acea active qualification systems, in fact, all suppliers must fill in self-assessment questionnaires, which include social and environmental questions. *Relations with stakeholders* pages 115, 119, 120, 121, 122; *Relations with the environment* pages 157, 175, 180.	**Art. 3 paragraph 1, letter c):** The main risks generated or suffered [...] deriving from the business, its products, services or commercial relations, including, where relevant, the supply and subcontracting chains
	308-2 Actual and potential negative environmental impacts in the supply chain and actions taken. *Relations with stakeholders* pages 119, 120, 121, 122; *Relations with the environment* pages 157, 175, 180.	**Art. 3 paragraph 1, letter c):** The main risks generated or suffered [...] deriving from the business, its products, services or commercial relations, including, where relevant, the supply and subcontracting chains **Art. 3 paragraph 2, letter c):** the impact [...] on the environment
GRI 400: SOCIAL TOPICS 2016		
TOPIC	EMPLOYMENT	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 124, 136. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 124, 136.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 124, 136.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 401: Employment 2016	**New employee hires and employee turnover. Total number and rate, by age group, gender and region.** *Relations with stakeholders* pages 115, 123, 124, 126 table no. 36, 127 table no. 37, 128.	**Art. 3 paragraph 2, letter d):** aspects relating to staff management
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees. *Relations with stakeholders* page 140	**Art. 3 paragraph 2, letter d):** aspects relating to staff management

GRI 401: Employment 2016	**401-3 Parental leave. Total number of employees that were entitled to parental leave, that took parental leave, that returned to work after parental leave ended, by gender, etc.** Acea operates in compliance with the Consolidated Act on the protection and support of maternity and paternity (Italian Legislative Decree no. 151/2001 as subsequently amended and supplemented), which regulates leave, rest, permits and economic support to workers connected with the maternity and paternity of natural, adopted and fostered children. The legislation bans any discrimination for reasons based on gender, with specific regards to any less favourable treatment due to being pregnant, a mother or a father; it establishes compulsory maternity for a period running from two months before and three months after delivery and guarantees that the job will be kept during that period, laying down a ban on dismissal; it also establishes that the resource will be returned to the duties carried out prior to the leave or equivalent duties, envisaging sanctions for any employers breaching this law. Therefore, 100% of employees using this type of leave, maintain their job and return to work. **382 employees** in 2017 made use of **parental leave**, of whom 142 were men and 240 were women. **Everyone**, at the end of the leave period, **returned to work**.	**Art. 3 paragraph 2, letter d):** aspects relating to staff management **Art. 3 paragraph 2, letter e):** action taken to prevent discriminatory action or behaviour
TOPIC	LABOR/MANAGEMENT RELATIONS	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Relations with stakeholders* page 131. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Relations with stakeholders* page 131.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Relations with stakeholders* page 131.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 402: Labor/Management Relations 2016	**402-1 Minimum notice periods regarding operational changes. Report whether the notice period and provisions for consultation and negotiation are specified in collettive agreements.** *Relations with stakeholders* pages 131 et seq.	**Art. 3, paragraph 2, letter d):** method by which dialogue is entertained with the corporate parties
TOPIC	Occupational Health and Safety	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 135, 137, 148. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 135, 137, 148.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 135, 137, 148.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 403: Occupational Health and Safety 2016	**403-1 Workers representation in formal joint management–worker health and safety committees.** In Acea, the provisions are respected of Italian Legislative Decree no. 81/2008 on health and safety at work. Therefore, by means of 65 appointed figures who take part in formal commissions (comprising management and worker representatives), in order to monitor and consult worker health and safety protection, as envisaged by Italian Legislative Decree no. 81/08, 100% of workers are represented. *Relations with stakeholders* page 133.	**Art. 3 paragraph 2, letter c):** the impact [...] on health and safety **Art. 3 paragraph 2, letter d):** aspects relating to staff management

GRI 403: Occupational Health and Safety 2016	**403-2 Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities, by gender and region.** In 2017, the absenteeism rate is 3.79% (3.78% male absenteeism rate and 3.84% female absenteeism rate). *Relations with stakeholders* pages 122, 132 and chart no. 38, 133, 135, table no. 40.	**Art. 3 paragraph 2, letter c):** the impact [...] on health and safety **Art. 3 paragraph 2, letter d):** aspects relating to staff management
	403-3 Workers with high incidence or high risk of diseases related to their occupation. *Relations with stakeholders* pages 133, 135.	**Art. 3 paragraph 2, letter c):** the impact [...] on health and safety **Art. 3 paragraph 2, letter d):** aspects relating to staff management
	403-4 Health and safety topics covered in formal agreements with trade unions. *Relations with stakeholders* pages 131, 133.	**Art. 3 paragraph 2, letter c):** the impact [...] on health and safety **Art. 3 paragraph 2, letter d):** aspects relating to staff management [...] method by which dialogue is entertained with the corporate parties
TOPIC	TRAINING AND EDUCATION	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 135, 136, 141. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 135, 136, 141.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 135, 136, 141.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 404: Training and Education 2016	**404-1 Average hours of training per year per employee; by gender and employee category.** *Relations with stakeholders* pages 138 and chart no. 39 and table no. 41.	**Art. 3 paragraph 2, letter d):** aspects relating to staff management
	404-2 Programs for upgrading employee skills and transition assistance programs. *Relations with stakeholders* pages 135, 136 et seq.	**Art. 3 paragraph 2, letter d):** aspects relating to staff management
	404-3 Percentage of employees receiving regular performance and career development reviews. In 2017, under the scope of the current Staff Management System, all staff of the Group companies in the reporting period were assessed (100%). *Relations with stakeholders* page 141.	**Art. 3 paragraph 2, letter d):** aspects relating to staff management
TOPIC	DIVERSITY AND EQUAL OPPORTUNITIES	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Relations with stakeholders* pages 129, 142 et seq. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Relations with stakeholders* pages 129, 142 et seq.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Relations with stakeholders* pages 129, 142 et seq.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them

GRI 405: Diversity and Equal Opportunity 2016	**405-1 Diversity of governance bodies and employees. Percentage of individuals within the organization's governance bodies, by gender, age group and other indicators of diversity. Percentage of employees per employee category, by gender, age group and other indicators of diversity.** The figure, relative to all companies in the scope of the consolidated non-financial Statement, is presented in the Report, divided up by gender; data on age and other diversity indicators is not available. *Corporate identity page* 51; *Relations with stakeholders* pages 126 and chart no. 35 and table no. 36, 128 and table nos. 38, 141, 142 et seq.	**Art. 3 paragraph 2, letter d):** social aspects and aspects relating to staff management
	405-2 Ratio of basic salary and remuneration of women to men for each employee category, by significant locations of operation. The collective national employment contract applied in Acea envisages equal remuneration for men and women of equal classification. *Relations with stakeholders* page 129 and chart no. 37.	**Art. 3 paragraph 2, letter d):** social aspects and aspects relating to staff management
TOPIC	LOCAL COMMUNITIES	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* pages 56, 58 et seq; *Relations with stakeholders* pages 69 et seq., 74, 82, 85, 88, 89, 91, 108, 146, 147 et seq. **Topic Boundary: main Group companies and various stakeholders.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* pages 56, 58 et seq.; *Relations with stakeholders* pages 69 et seq., 74, 82, 85, 88, 89, 91, 108, 146, 147 et seq.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* pages 56, 58 et seq.; *Relations with stakeholders* pages 69 et seq., 74, 82, 85, 88, 89, 91, 108, 146, 147 et seq.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 413: Local communities 2016	**413-1 Operations with local community engagement, impact assessments, and development programs.** 100% of the main Group companies implement initiatives to involve stakeholders. *Disclosing sustainability: methodological note* page 13; *Corporate identity* pages 55, 57, table no. 8, 58 et seq.; *Relations with stakeholders* pages 69, 81 et seq., 85 et seq., 88 et seq., 91, 105, 108 et seq., 112, 114 et seq., 119, 120 et seq., 122, 150; *Relations with the environment* page 166.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment and on health and safety
	413-2 Operations with significant actual and potential negative impacts on local communities. *Corporate identity* pages 58 et seq.; *Relations with stakeholders* pages 147 et seq.; *Relations with the environment* page 160.	**Art. 3 paragraph 2, letter c):** the impact [...] on the environment and on health and safety
TOPIC	SUPPLIER SOCIAL ASSESSMENT	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56. **Topic Boundary: main Group companies; suppliers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56. *Relations with stakeholders* pages 119, 120 et seq.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56. *Relations with stakeholders* pages 115, 121.	**Art. 3 paragraph 1, letter b):** lthe policies applied by the company [...] and the results achieved through them

GRI 414: Supplier Social Assessment 2016	**414-1 Percentage of new suppliers that were screened using social criteria.** 100% of suppliers registered for qualification systems. By way of compulsory requirement for registration with the Acea active qualification systems, in fact, all suppliers must fill in self-assessment questionnaires, which include social and environmental questions. *Relations with stakeholders* pages 119, 122.	**Art. 3 paragraph 1, letter c):** the main risks generated or suffered [...] deriving from the business, its products, services or commercial relations, including, where relevant, the supply and subcontracting chains **Art. 3 paragraph 2, letter c):** the impact [...] on health and safety
	414-2 Negative social impacts in the supply chain and actions taken. *Relations with stakeholders* pages 119, 122.	**Art. 3 paragraph 2, letter c):** the impact [...] on health and safety
TOPIC	PUBLIC POLICY	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Relations with stakeholders* pages 146 et seq. **Topic Boundary: mail Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Relations with stakeholders* pages 146 et seq.	**Art. 3 paragraph 1 letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Relations with stakeholders* pages 146 et seq.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 415: Public Policy 2016	**415-1 Political contributions. Total monetary value of financial and in-kind political contributions made directly and indirectly by the organization by country and recipient/beneficiary.** *Relations with stakeholders* page 146.	**Art. 3 paragraph 2, letter f):** fight against both active and passive corruption
TOPIC	CUSTOMER HEALTH AND SAFETY	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 87 et seq. 89 et seq., 147 et seq.; *Relations with the environment* pages 164, 168. **Topic Boundary: main Group companies; customers; community.**	**Art. 4, paragraph 1:** : the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 87 et seq. 88 et seq. 90, 91 et seq., 147 et seq. *Relations with the environment* pages 164, 168.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56. *Relations with stakeholders* pages 87 et seq. 89 et seq., 147 et seq. *Relations with the environment* pages 164,168.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 416: Customer Health and Safety 2016	**416-1 Assessment of the health and safety impacts of product and service categories.** *Corporate identity* pages 55, 57 table no. 8; *Relations with stakeholders* pages 87, 89, 90 et seq., 92, 150; *Relations with the environment* pages 164, 168 et seq.	**Art. 3 paragraph 2 letter c):** The impact [...] on health and safety
	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services. *Relations with the environment* page 159.	**Art. 3 paragraph 2, letter c):** the impact [...] on health and safety

TOPIC	MARKETING AND LABELING	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Relations with stakeholders* pages 69, 74 et seq. 76 et seq., 82, 83, 85, 101 et seq., 103 et seq., 122, 147. **Topic Boundary: main Group companies; customers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Relations with stakeholders* pages 74 et seq. 76 et seq. 80, 82 et seq., 85 et seq., 101 et seq., 103 et seq., 122, 147.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Relations with stakeholders* pages 74 et seq. 76 et seq., 82 et seq., 85 et seq., 101 et seq., 103 et seq., 122, 147.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 417: Marketing and Labeling 2016	**417-1 Requirements for product and service information and labeling.** The international indicator GRI, by virtue of the reference made to "services" as well as to products, is reported, adjusting it to the national context and the operations of a multiutility, both in respect of parameters relating to the quality of water distributed and in respect of the quality performance of the services managed (commercial, contractual and technical - of continuity), in the water area and energy area, subject to regulation by the sector authority, monitored by corporate procedures and communicated. *Relations with stakeholders* pages 74 et seq., 76 et seq., 77 table no. 13, 80 table no. 14 and 15, 82 et seq., 83 table no. 19, 85, 87 and table no. 21, 90 and table no. 24, 93 et seq., 94 table no. 28, 96 table no. 29, 98 table no. 30, 100 et seq., 103 et seq., 106 table no. 32; *Relations with the environment* page 168.	**Art. 3 paragraph 1, letter b):** non-financial key performance indicators
	417-2 Total number of incidents of non-compliance with regulations and/or voluntary codes concerning product and service information and labeling. *Relations with stakeholders* pages 74 et seq., 76 et seq., 77 table no. 13, 80 table nos. 14,and 15, 82 et seq. 83 table no. 19, 93 et seq., 94 table no. 28, 96 table no. 29, 98 table no. 30, 101 et seq., 104 et seq., 106 table no. 32, 147.	**Art. 3 paragraph 1, letter b):** non-financial key performance indicators
	417-3 Total number of incidents of non-compliance with regulations and/or voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship. *Relations with stakeholders* pages 122,147.	**Art. 3 paragraph 1, letter b):** non-financial key performance indicators
TOPIC	CUSTOMER PRIVACY	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 103, 137, 151. **Topic Boundary: main Group companies; customers.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4, paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* page 103, 137, 151.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 103, 137, 151.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 418: Customer Privacy 2016	**418-1 Substantiated complaints (received from outside parties and/or received from regulatory bodies) concerning breaches of customer privacy and losses of customer.** In 2017, one case of complaint was recorded as brought against Acea Energia with regards to a report for hypothetical violation of the procession of personal data and consequent related recording of information sent by the Company to the Privacy Authority. In respect of the case signalled, no fines have been applied by the Authority.	**Art. 3 paragraph 1, letter b):** non-financial key performance indicators

TOPIC	SOCIO ECONOMIC COMPLIANCE	
GRI 103: Management approach 2016	**103-1 Explanation of the material topic and its Boundary.** *Corporate identity* page 56; *Relations with stakeholders* pages 76, 83, 93, 147. **Topic Boundary: main Group companies.**	**Art. 4, paragraph 1:** the consolidated declaration includes the data of the parent company and its fully consolidated subsidiaries **Art. 4 paragraph 1:** measure necessary to ensure the understanding of the group business, its performance, results and the impact it produced
	103-2 The management approach and its components. *Corporate identity* page 56; *Relations with stakeholders* pages 76, 83, 93, 101, 102, 105, 110, 147.	**Art. 3 paragraph 1, letter a):** the business management and organisational model **Art. 3 paragraph 1, letter b):** the policies applied by the company
	103-3 Evaluation of the management approach. *Corporate identity* page 56; *Relations with stakeholders* pages 76, 83, 93, 105, 147	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them
GRI 419: Compliance 2016	**419-1 Non-compliance with laws and regulations in the social and economic area (total monetary value of significant fines; total number of non-monetary sancyions etc.).** *Relations with stakeholders* pages 82 note 44, 102, 147; *Relations with the environment* page 159.	**Art. 3 paragraph 1, letter b):** the policies applied by the company [...] and the results achieved through them

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