

FINANCIAL DISCLOSURE

During the year Acea participated in **numerous events** (meetings, extended presentations, *investor conferences*, *roadshows* and *reverse roadshows*), **with about 220 investors and sell-side analysts, in both equity and credit**. In consideration of the global health emergency caused by Covid-19, most of the communication events were held in “virtual” mode.

In addition, **conference calls** with the financial community were held, also on the occasion of approval of the annual and interim results and the presentation of the 2020-2024 Business Plan, and **more than 240 analysts/investors took part in these**.

Approximately 160 studies/reports on Acea shares were published during the year under review. Seven **business banks** analyse Acea shares with a high level of continuity, six of which, as of 31 December 2020, express “positive” ratings and one of which express “neutral” ratings.

ESG ANALYSTS EVALUATE ACEA

An analysis conducted in November 2020 showed that “**sustainable investors**” are showing a growing interest in Acea. Such investors represent almost 5% of the share capital and **about 35% of the total institutional investors**. These are mainly European funds (4% of Acea’s capital), followed by North American investors.

In the last year, characterised by the pandemic crisis, **institutional investors’ further increased their interest in ESG issues**, which are increasingly integrated into investment decisions.

In 2020, the Investor Relations & Sustainability Department was created with the objective of marrying and integrating aspects of a **financial nature with the Group’s sustainability goals and ESG aspects** in relations with Italian and foreign analysts and institutional investors, ensuring the correct valuation and positioning of the Acea Group.

Over the year, Acea the opinions of analysts, ratings and benchmarks were as illustrated below.



The **CDP (formerly the Carbon Disclosure Project)**, supported by more than 500 international investors, promotes worldwide attention to the management of climate change risks and impacts, inviting companies to provide detailed and timely information on their ability to manage the issue. Based on the data and information received, each year the CDP publishes a ranking of its assessments for each organisation. Acea, already evaluated for years, received an **A- score** in 2020, in line with the previous year, confirming its position in the **Leadership area** (for details, see the box in the chapter on *Strategy and Sustainability*).



In 2019 Acea received the first **sustainability solicited rating** from the independent agency **Standard Ethics (SE)**, with an **EE-** rating (*investment grade*), scale F/EEE) and in 2020 both the *long-term expected rating* (from stable to EE+) and the outlook (from stable to positive) **improved**. Lastly, it should be noted that, again in the year in question, **Acea’s was included among the 15 largest listed EU Multiutilities** that make up the **SE European Multi-Utilities Index**. This index, together with the SE European Utilities Index, intends to provide an overview of the level of sustainability progressively achieved by European companies operating in the essential public services sector.




ISS ESG (formerly ISS Oekom) gave Acea a C+ rating (scale D-/A+), in line with the ratings already issued previously.


The Group’s ESG performance was also analysed by **Sustainalytics, VigeoEiris, MSCI, FTSE Russe I ESG, Refinitiv**.

In the year in question, Acea was included in the **Bloomberg Gender Equality Index**. This index includes 325 companies, from a panel of around 6,000 organisations analysed, which best recognise **gender equality** in terms of both disclosure and business practices (for more details see the paragraph on *Diversity and inclusion* in the *Staff* chapter). Lastly, it should be noted that, in the last part of the year, the performance of **preparatory activities for the first issue of sustainable finance instruments** by Acea, through the definition of a Green Financing Framework, led to the issuing of the Acea’s first Green Bond in January 2021.


INSTITUTIONS AND THE COMPANY




Acea RECEIVES THE “Prize of Prizes” AND THE “Companies for Innovation Award”




RESEARCH AND INNOVATION: **projects worth over €13 million** IN THE YEAR



Acea DEVELOPS THE LabSharing platform FOR SHARING **know-how** AND STATE-OF-THE-ART EQUIPMENT OUTSIDE THE COMPANY



Acea IS PARTNER OF THE National Association of Young Innovators



Acea took part in THE Energy, Environment AND Sustainability Technical Table FOR THE DRAFTING OF THE **Manifesto for Energy and Sustainability**

Acea interacts with institutional actors and stakeholders of reference according to a participatory logic in order to generate shared value for the benefit of all stakeholders, primarily the community and the regions it operates in.

RELATIONS WITH INSTITUTIONS

Relations with the institutions are focused on the economic dimension (taxes and fees) and the social dimension (relations with local institutions, sector authorities, consumer associations and other civil representatives etc.), in line with current legislation and the Group's *Code of Ethics*.

The economic value distributed to **public authorities** in the form of taxes in 2020 is **€ 134.6 million** (approx. € 123.2 million in 2019). The tax rate for the year is equal to 29.2% (it was 28.6% last year). **Based on the most recent Country by Country Report, which Acea filed with the Revenue Agency in 2020, and refers to 2019 data**, most taxes are **paid in Italy**, for 98% of the overall value⁹⁷. The remaining 2% is paid in the Dominican Republic, Honduras and Peru, where the Company operates in the water sector to improve the service, with particular reference to the technical and managerial aspects (see the chapter on *Water Company Data and overseas activities*). Overseas activities are exclusively tied to **managed businesses and cannot be linked to delocalisations carried out to draw fiscal benefits from favourable jurisdictions**. In fact, Acea has not defined a tax strategy and does not intend to establish any aggressive tax planning to gain a competitively advantageous position. **The Tax Management Unit** within the Holding Company's Administration, Finance and Control Department, has the main function of developing tax policy at the Group level, monitoring legislative changes and ensuring periodic compliance, managing – as key owners – the relative risks, which are assessed, managed and monitored within the wider ERM programme. Moreover, the Unit prepares specific reports on the matter for the Control and Risks Committee, where appropriate. Acea interacts with the relevant tax system authorities in a collaborative and transparent manner and the updating of the main legal tax disputes is reported annually in the *Consolidated Financial Statements*, to which reference should be made. In compliance with the relevant legislation, as mentioned, Acea produces a Country By Country Report⁹⁸, which lists the information on taxes paid for each jurisdiction in which the Company operates. The data flow into the *Consolidated Financial Statements*, which are subject to legal audit.

Acea regularly pays contributions and registration fees owed to public and private bodies, such as chambers of commerce, independent administrative authorities, industry associations and representative bodies. In 2020, the total amount of this item was approximately € 2.63 million (€ 2.94 million in 2019).

Partnerships with **public institutions** are aimed at carrying out **initiatives with positive effects in the local region and the public's quality of life** (see the chapters *Customers and the community*, *Personnel* and *Relations with the environment*).

Article 17 of the Group's **Code of Ethics**, devoted to relations with institutions, the public administration and political and trade union organisations, establishes that: *"Acea cooperates actively and fully with the independent Authorities, establishes relations with the Public Administration by strictly observing the provisions of the law, applicable regulations, provisions contained in the Organisation and Management Model pursuant to Legislative Decree 231/01 and in internal procedures [...]. Acea does not contribute in any way to the financing of political parties, trade unions movements, committees or organisations [...] or their representatives and candidates [...] Acea does not make contributions to organisations with which a conflict of interest may arise [...] In any case, Acea's personnel shall refrain from any behaviour aimed at exerting pressure (direct or indirect) on political and trade union representatives or representatives of associations in potential conflict of interest in order to obtain personal or corporate advantages"*.

The supervision of relations with institutional entities is defined by **an organisational model** that attributes **competences and responsibilities** to the corporate structures of reference. In particular, the **Institutional Relations Unit** protects corporate interests and represents the Group's positions in dialogue with Industry associations, Research centres, Standard-setting bodies and local, national and international public and private institutions and bodies. The **Corporate, Legal, Affairs and Services Department** supports the Group Companies for **legal aspects** related to the activities, dealing with communications with the securities market **Supervisory Authorities** (Borsa [Italian stock exchange] and Consob [National Commission for Companies and the Stock Exchange]) and the **Regulatory Function**, in coordination with the relevant divisions established within the Group Companies, as well as relations with the **regulatory bodies** in the relevant sectors, also to minimize exposure to regulatory risk.

The **Group's operating companies**, jointly with the Parent Company, manage the **"technical and specialist" aspects** of the managed services – water and electricity supply, public lighting and the environmental sector – **including through interaction** with administrative, regulatory and control bodies.

⁹⁷ The low amount of revenue, and consequently the taxes paid, in relation to the Group's activities in foreign countries has led to the overseas companies being reported as non-material from an economic/financial point of view; in addition, the potential evolution of the sector and other strategic and representative criteria regarding the Group's development and main impacts, have resulted in them not being included within the scope of the Consolidated Non-Financial Disclosure. Moreover, this ensures that the issue of Taxes relating to GRI 207 is not included among the material issues (economic and governance) identified in the last materiality analysis cycle performed by Acea. Although the issue introduced by GRI 207, on Taxes, was not included among the material issues with the involvement of stakeholders and managers, and therefore does not appear in the GRI Content Index, it is in any case mentioned here as testament to transparency and good accounting practice.

⁹⁸ The obligation arises for the Parent Company due to its control of Acea International, the vehicle Company through which shares in the overseas companies are held.

In the regulated sectors, the Regulatory Authority for Energy, Networks and Environment (ARERA) has long established **bonus and penalty mechanisms** to encourage the improvement of the performance of service operators. In 2020, **Areti** paid the Authority a penalty of approximately €5.4 million, with reference to the previous year's operations, for regulating the continuity of the electricity service for LV users. It also paid approximately €129,000 to the Cassa per i Servizi Energetici e Ambientale (CSEA) for exceeding the standards set for MV users and €1.1 million to end customers for prolonged and extended interruptions.

Areti also earned approximately € 3 million as a resilience premium on the 2019 accrual.

The same Company appealed to the Lombardy Regional Administrative Court in relation to ARERA resolution no. 270/2020/R/EFR of 14 July 2020, which approved the revision of the tariff contribution to be paid to distributors fulfilling their energy saving obligations under the TEE mechanism. Water companies **Acea Ato 2, Acea Ato 5, AdF, Gori and Gesesa** accrued automatic compensations payable to customers during the year of approximately €659,000, €123,000, €47,000, €280,000 and €37,000, respectively, in relation to contractual quality performance. In January 2020 Acea Ato 2 sent the STO the 2019 data related to the performance of contractual quality, and following verification the Secretariat calculated a bonus of about € 33.1 million.

During 2020, AGCM filed an appeal in order to obtain the annulment and/or reform of judgment no. 11960/2019 of the Lazio Regional Administrative Court, which fully upheld the appeals filed by **Acea SpA, Acea Energia and Areti** against the AGCM measure (measure 27496/2018) that jointly sanctioned the companies for €16.2 million for alleged anti-competitive conduct in the energy sales market.

In addition, in relation to the sanctioning measure of the AGCM issued at the end of the proceeding (PS9815) concerning the unsolicited activations of electricity and gas supplies, in its ruling of 24/09/2020, the Lazio Regional Administrative Court rejected the appeal lodged in 2016 by **Acea Energia**. The Company has appealed against this judgment. By way of Resolution no. 533/2019/S/com, the sanctioning procedure concerning the application of a surcharge to domestic end customers for receiving a paper invoice as part of free market offers was also closed against Acea Energia. Following the approval of the commitments submitted by **Acea Energia** in the framework of this proceeding, the Company started to fulfil them at the end of February 2020.

On 27 July 2020, **Acea Energia and Areti** lodged an appeal with the Lombardy Regional Administrative Court against resolution 184/2020/R/com, by which ARERA brought the sector legislation into line with the provisions of the 2020 Budget Law, providing that the provisions on the two-year statute of limitations apply to end customers by virtue of the mere passage of time.

As regards the water sector, **Acea Ato2, Acea Ato5, Gesesa, Acea Molise, Gori, Acquedotto del Fiora and Umbra Acque** appealed to the Lombardy Regional Administrative Court against resolution 186/2020/R/Idr, pursuant to which ARERA also brought the regulations for this sector into line with the 2020 Budget Law on the subject of the two-year statute of limitations applicable to end users.

During the year, 12 treatment plants operated by Gesesa were seized by the judicial authorities.

Finally, as for the litigation procedures of an environmental nature with public enforcement authorities (Arpa, Forestry, etc.), see *Relations with the environment* and the *Environmental Accounts*.

PROTECTION OF COMMON ASSETS

In synergy with public institutions, private parties and research bodies, Acea deals with **initiatives and projects of an environmental and social nature aimed at protecting common assets**.

In 2020, the water sector companies continued their commitment to increase the reliability of managed water systems and improve water distribution systems.

Acea Ato 2 prepared the **final design** for the construction of the new upper section of the Peschiera aqueduct, subject to the opinion of the Senior Public Works Council (Consiglio Superiore Lavori Pubblici [CSLP]), and prepared the **technical-economic feasibility plan** for the construction of the two sections of the new Marcio aqueduct. Both projects are aimed at improving the safety of Rome's and the surrounding province's water supply and **increasing the resilience of aqueduct systems** in order to improve the quality of the integrated water service. The Company has also prepared a **preparatory document** for the supply and transport of water within the territory of OTA 2, **with a view to the strategic value and resilience of the infrastructure, environmental protection and the maximisation of effectiveness and efficiency for the service provided to citizens**.

With reference to the **implementation of the Water Safety Plans**, aimed at preventing and mitigating the water risk, in 2020 the Company carried out many activities (also see *Relations with the environment, Water segment*). To date, Acea Ato 2 has completed the inspection and **check list activities for 6 aqueduct systems**, and the **WSP (water safety plan) documents have been sent to the Ministry of Health for 3 aqueduct systems**.

AdF has advanced the **project for the development and implementation of the WSP on the aqueduct systems fed by**

the Santa Fiora springs, performing the **infrastructural risk analysis**, with an approach based on the FMEA methodology (*Failure Mode and Effect Analysis*). **Gori** took part in the **national working group for the drafting of the "National Guidelines for the Implementation of Water Safety Plans"** and for the development of the National Distance Training Course for team leaders for the implementation of WSPs, collaborating with the Ministry of Health and the Italian National Institute of Health. **Gesesa** entered into a collaborative project with the University of Sannio to start the drafting of the WSPs; it also defined the **extraordinary water efficiency plan which will commence in 2021** with the restructuring of the main water districts.

With regard to **energy distribution**, Acea took part in the **PlatOne project** (PLATform for Operation of distribution Networks), a European consortium of companies and organisations with the goal of developing a technological solution capable of optimising the functioning and management of the electricity network, making it more stable and resilient. In particular, Acea, through Areti and Acea Energia, is one of the organisations responsible for **coordinating the "Italian pilot"** which will be carried out in the Rome area.

Acea Ambiente carried out public utility projects which principally concerned the **"Waste to Material" chain**, with the recovery of raw and secondary materials from waste entering dedicated plants, the treatment of fly ash, and the extraction of critical raw materials from treatment sludge. In addition, the Company has started the **UrBees project, for biomonitoring air quality** around the San Vittore plant in Lazio through the use of bees (also see *Relations with the environment*).

With regard to **environmental sustainability and the circular economy**, Acea participated in the activities of the **Italian Industrial Research and Development Centre (AIRES)**, a network of businesses, institutions and technological consortia engaged in the **development of the circular economy and environmental sustainability**, and took part in the **Italian Phosphorus Platform promoted by the Ministry of the Environment and managed by ENEA**, developing dedicated projects, also thanks to the availability of European financing (also see *Relations with the environment*). Lastly, through the **Circular Economy Protocol**, and with the involvement of local stakeholders, AdF has established a **Qualification System reserved for local businesses aimed at supporting the economic relaunch of the area and productive entities**, which is in difficulty due to the pandemic (also see the chapter on *Suppliers*).

EMERGENCY MANAGEMENT PLANS

Acea is active in the **prevention and management of critical events**, and in the **event of an emergency** it provides support to the **authorities responsible for public health, civil protection and public safety**.

In particular, the Group companies ensure **the highest levels of safety and continuity in the provision of managed services**, in collaboration with public institutions.

To this end, they have established **procedures and tools** that, in the event of critical events (unavailability of central systems, breakdowns, adverse weather conditions, peak demand and network stress, etc.), protect the normal **operating conditions of networks, plants and systems to be restored in a timely manner** (see also the chapter on *Protection of assets and management of internal risks* in the section on *The Company as a stakeholder*).

Each operating Company has **plans for managing emergencies and intervention procedures** and, through the **control centres, constantly monitors the status of networks and equipment** – water and sewage, electricity and public lighting – in partnership with the **Municipal and National Civil Protection and Roma Capitale**.

Whenever an event affects the managed services (damage to plants and/or networks, water/energy crisis, etc.), the companies of the Group notify the competent bodies in order to facilitate the coordination of interventions.

Acea SpA has a **procedure for the management of health and environmental emergencies** having an impact on the population, for which **it defines a risk level** (low, medium and high) and consequently organises intervention teams.

The **Areti emergency management plan**, the Company that handles **the distribution of electricity**, deals with widespread breakdowns and unavailability of the grid. It defines the different **states of activation** (ordinary, alert, alarm and emergency), according to the operational and environmental conditions, the **procedures** for the activation (and subsequent reset) of the same states, the **units involved** and the respective roles, and the **resource materials** necessary for maintaining or restoring equipment. It also provides for the appointment of a **Head of Emergency Management** and an employee dedicated to the **management of safety**, in established cases. The **detailed Operating Plans** indicate methods for quickly managing the types of disruption (such as flooding, fires, disruptions to the remote-control network, etc.) and procedures to be followed, for example, **for restarting the electrical system in the event of a blackout** of the National Transmission Grid (NTG) or **re-establishing power for strategic users** (such as parliament,

the government, the State of Vatican City, etc.), **the materials, equipment and resources to be involved** depending on the case. The master plan and detailed operating plans are **updated on a yearly basis** and periodically improved on the basis of analyses of real cases. The effectiveness of procedures and the functionality of equipment are tested by means of drills. In addition, with a view to improving processes, in 2020 the Company **created a platform** for the real-time **acquisition and monitoring of weather events**, in order to prevent potential risks from changes to the operating conditions of the electric grid.

Plans for the management of emergencies of the **water companies** and shared with local institutions (such as Governmental Territorial Offices, Local Health Authorities, Area Management Agencies) define conditions that compromise the **continuity and quality of the integrated water service, classify the emergency levels**, describe the **preventive and remedial measures** for the types of unforeseen events (damage to the networks, pollution, water crisis and emergencies related to the sewerage and treatment service) and provide for the division of tasks among the areas involved (technical area and communications). In particular, the Acea Ato 2 Plan was reviewed, consistent with the Water Safety Plan guidelines, and takes 25 critical scenarios into consideration, specifying the consequences, manoeuvres and mitigation actions required for each of them. In 2020, **Acea Ato 2 updated the Emergency Management Plan on the basis of the procedures currently in effect under pandemic conditions and in light of the organisational changes that had taken place within the Company**. In addition, the **Emergency Standing Committee** was established. It meets periodically to approve the Plan, propose interventions and training activities, and decide on actions to be taken under serious emergency conditions.

AdF collaborates with the **Tuscan Water Authority** on the updating of the **Emergency Operating Plan for the drinking water crisis (EOP)**, aimed at monitoring and preventing water emergencies through the periodic reporting of critical issues found within the region, and providing support for operational decisions when an emergency arises. In the context of the critical issues outlined in the Plan, AdF has an **Water Crisis Emergency Management Operating Procedure** which, for every forecast level of severity in terms of water availability, establishes the sequence of activities to be carried out, detailing all of the entities involved, measures to be taken, documents/databases to be consulted/updated/produced, and correspondence to be sent.

Gesesa is an active member, together with other authorities such as the Province of Benevento, the Municipality of Benevento, EIC, the Region of Campania, ARPAC [Campania Regional Environmental Protection Agency] and local health authorities, etc., of the **technical panel to ensure that the local aquifer** is safe from tetrachloroethylene pollution.

The **companies of the Group that manage waste treatment plants** ensure the execution of a detailed **routine maintenance plan to reduce plant downtime caused by faults or unexpected events** and minimize unplanned non-routine maintenance work. All the structures of each site are equipped with **Emergency Plans** that take into account the **scenarios identified for endogenous and exogenous emergencies**. These Plans examine aspects related to the **safety of workers**, ensuring their safety with specific behavioural and evacuation procedures, checked on a yearly basis, and aspects related to the **protection of the environment**, identifying the emergency interventions in order

to limit contamination of environmental media (air, water and soil). Permits by virtue of which the plants are managed also include communication requirements and methods for **non-routine or emergency events to the competent bodies**, in order to guarantee the maximum dissemination of information and, where appropriate, the coordination of the intervention. Lastly, in 2020, as a result of the **Covid-19** emergency **Acea Elaberi updated the Grottarossa Centre Emergency Plans**.

PROJECTS FOR THE INNOVATIVE AND SUSTAINABLE DEVELOPMENT OF THE AREA

In 2020, in continuity with past years and in concert with local administrators, Acea Ato 2 continued the **installation of Water Kiosks** in Rome and vicinity, which made it possible to equip the areas **with 95 kiosks** (see chapter *Customers*, section *Quality delivered in the water segment*). **AdF** also started the project to install Water Kiosks and **surveyed the needs of all Municipalities within the area served**, in view of the tender process for awarding the work to install **more than 50 pumps in the next two years**.

In addition, Acea has collaborated with **ENEA** in the context of a dedicated protocol, **for the development of projects relating to the sustainable management of the waste and water cycle**, with the objective of applying innovative technologies and solutions to the managed industrial projects, principally in the water and waste treatment sectors, in line with the strategic objectives for industrial development in the circular economy. In terms of **smart cities**, in partnership with Roma Capitale, the Company developed the **plan for electric mobility**, also defining the strategy for e-mobility to combat the *mobility divide* due to the infrastructure gap, and started the test phase for the Charging Point Operator and Mobility Service Provider platform, through an internal car-sharing service with 25 electric cars. During the course of 2020, the **platform test phase was successfully completed** and, through the Company Electric Drive Italia, acquired in May 2020, **Acea Innovation was able to complete the development of the Charging Point Operator platform and make the Mobility Service Provider platform available to Acea Energia**. In addition, in 2020 Acea Innovation further developed the existing partnership with Guido Carli LUISS University, offering students not just a mobility services platform (management of charging and booking of the car or a seat in the shuttle), but also electric shuttles for internal mobility. The Company has installed the first charging columns for electric cars and **completed the approval procedure, at the Services Conference, for the installation of 115 columns in the Municipality of Rome**.

In order to promote the innovative and sustainable development of the sectors of reference, Acea establishes **collaborations and partnerships with complementary companies** or organisations operating in sectors similar to the businesses it manages and **with innovative players**.

In 2020, Acea was a partner of the **“Circular 4 Recovery”** call for projects, promoted by Marzotto Venture Accelerator to **select innovative projects aimed at creating eco-friendly development models and fostering the transition to a more sustainable economy**. In particular, the call selects, awards and supports entrepreneurial projects aimed at the development of innovative technologies, solutions and services with a low environmental and social impact in the following 5 Key Focus Areas of the Circular Economy: *Circular Bioeconomy, Circular Water Economy, Circular Energy Economy, New Circular Life Cycles, Circular City & Land*. The Company has **signed specific agreements (MOU) with private**

companies engaged in the green and circular economy, advanced systems design, innovative recycling treatments, waste recovery and emission reduction sectors, including the memorandum with Nextesense, aimed at the use of visible-light sanitising lamps (BIOVITAE) in the purification of water and waste; the agreement entered into with the Company OPUS for the creation of an analytical robot for analysing total suspended solids in wastewater, with the possibility of obtaining a joint patent for the product; the understanding reached with the Company RAFT for the production of new technologies for reducing emissions, particularly odorous emissions, through photocatalysis and catalytic oxidation; the collaboration agreement entered into with the SERSYS Group for the joint development of projects and collaboration in the field of waste treatment and specialist analytical activities.

Lastly, in December 2020, in collaboration with Kaggle, the Google platform that hosts the world’s largest community of data scientists, **Acea launched “Acea Smart Water Analytics”, the first global hackathon on Kaggle**, with the objective of developing a mathematical model capable of forecasting water availability at the many different supply sources (wells and aquifers) distributed throughout the territory to safeguard the bodies of water managed by Acea.

The virtuous relationship with the local region is also expressed through the **collaboration between Group companies and the world of school and academic education and research** (in the *Customers* chapter, see the section on *Communication, events and solidarity*, and in the *Personnel* chapter, see the section on *Development of human resources and communication*).

In the context of the **“SOSTenibile” school project**, **Acea Ambiente** distributed 320 water bottles bearing the Company logo to some schools in Umbria. In 2020, **AdF** continued the **“Acquadicasamia” project**, targeted at schools in the managed area, and launched an **online teaching section** for the 2020-2021 year, called AdF Educational, to offer environmental education lessons in a way that is compatible with social distancing restrictions. In compliance with the restrictions, **Gori** continued to interact with the schools throughout the year, in synergy with the local Municipalities, and particularly promoting the **“Plastic Free” project** and the distribution of more than 2,500 bottles to primary school pupils.

Collaborations between Acea and universities take place within the framework of **conventions and dedicated agreements**. Examples of this include the Framework Agreements with **the University of Tuscia** and **the University of Cassino and Southern Lazio**, aimed at creating collaboration in the field of **research and innovation**.

In the **energy sector**, Areti has established a collaborative project with the **University of Naples**, on specific technical projects, including **the development of algorithms for estimating and measuring the technical losses** of the low voltage electricity network and the **study of an electronic current transformer capable of solving the limitations inherent in traditional magnetic core devices**. For the electronic current transformer, a **patent application** has been filed, and a public tender process will also be organised for the related engineering and industrial production.

In the context of the **“Smart Metering 2G”** project, and together with **Turin Polytechnic University’s** Department of Electronics and Telecommunications, Areti participated in planning activities for RF 169 MHz coverage for Smart Metering 2G. Areti has commissioned a third-party Company to prepare the **169 MHz distribution model** in the Rome region and Turin Polytechnic University has verified and validated the proposed model.

Working with **Guido Carli LUISS University**, a **scientific research site was opened, aimed at disseminating the model for the leveraging of Company assets**, with the contribution of employees involved in dedicated workshops and, in scientific partnership with the LUISS Business School, a training programme called **Managerial Academy** continued throughout the year, aimed at creating a centre of **managerial excellence in the field of multi-utilities** in the Roman area (see the chapter *Personnel*, paragraph *Training and development of personnel*). Acea Ato 2 entered into a **research agreement** with Sapienza University of Rome's Department of Civil and Environmental Engineering for the completion of academic and research activities **aimed at making water distribution networks more efficient, reducing water losses and protecting the resource**. In addition, in order to assess **the impact of climate change on the availability of water**, it entered into a **collaboration agreement with the CNR's Water Research Institution** for the development of instruments and tools to model the maximum available drinking water flow rates in relation to weather/climatic conditions. Lastly, in terms of initiatives to protect sources of supplies, Acea Ato 2 entered into a **research agreement with Sapienza University of Rome's CERI Geological Risk Prevention and Control Research Centre**, for the study of geological hazards, with the implementation of monitoring systems and the relative reporting for managerial purposes, at the Peschiera and La Capore Springs plants. **Acea Ato 5** entered into an agreement with the **University of Cassino and Southern Lazio**, aimed at creating collaboration in the field of **research and innovation**.

Gori established a study, research and technical/scientific support agreement with **Federico II University of Naples' Department of Land, Environment and Resource Sciences**, for the de-

sign of a network to qualitatively and quantitatively monitor the principal aquifers in the area, the performance of hydrogeological analysis for the prevention of water deficits caused by climate change and better resource management.

Acea Elabori entered into a Collaboration Agreement with **Sapienza University of Rome's Civil and Industrial Engineering Faculty**, for the development of an effective training course connected to the needs of the world of work, the dissemination of the scientific culture and student support, and the increasing of female enrolment in the Faculty's courses, and signed a **Framework Agreement with the CNR (Italian National Research Council)** to collaborate on minimising the production of sludge and chemical contaminants; on combined treatments for liquid waste, sludge and organic fraction of municipal solid waste (OFMSW) with the recovery of material and energy with a view to a circular economy and sustainable management; on mobile plants for the localised treatment of sludge and waste; on the issue of atmospheric emissions with a focus on innovative solutions and the sustainable management of water resources.

Lastly, Acea has joined the **University of Milan School of Management's Startup Intelligence, Space Economy and Artificial Intelligence observatories**, and is a partner and member of the Scientific Committee of the **Level 2 Master's in Digital Open Innovation & Entrepreneurship**, provided by the **Campus Bio-Medico University of Rome**.

COMPARISON WITH THE REFERENCE CONTEXT

Acea participates in **Research Centres, Standard-setting Bodies and Industry Associations**, acting as promoter or contributing to studies in the businesses in which it operates.

THE 2020 MEMBERSHIPS OF RESEARCH CENTRES, STANDARD-SETTING BODIES AND INDUSTRY ASSOCIATIONS

During the course of the year the Group renewed and activated numerous memberships of organisations of interest, including:

- AGICI – Finanza d'Impresa;
- AICAS Associazione Italiana Consiglieri, Amministratori e Sindaci;
- AIDI Associazione Italiana Illuminazione;
- Analysis;
- Andaf;
- ANFOV;
- ASCAI;
- Aspen Institute Italia;
- Assochange;
- Associazione Amici della Luiss Guido Carli;
- Associazione Civita;
- Associazione Geotecnica Italiana;
- Associazione Italiana Internal Auditors;
- Associazione Italiana Esperti Infrastrutture Critiche (Italian Critical Infrastructure Experts Association – AIIC);
- Associazione Elettrotecnica ed Elettronica Italiana (Italian Electro-technical and Electronic Association – AEI);
- Associazione Idrotecnica Italiana (Italian Hydro-technical Association – AIH);
- Associazione nazionale fornitori di elettronica (National Electronics Suppliers Association – Assodel);
- Assonime;
- ASTRID;
- CEDEC Bruxelles (European Federation of Local Energy Companies);
- CEEP Bruxelles (European Centre of Employers and Enterprises providing Public services);
- Centro Studi Americani (Centre for American Studies);
- CDP Worldwide;
- CISPEL Confservizi Toscana;
- CLUB Ambrosetti;
- Comitato Elettrotecnico Italiano (Italian Electro-Technical Committee – CEI);
- Confindustria Umbria;
- Conseil de cooperation economique;
- CONSEL Consorzio Elis per le Formazione;
- CSR Manager Network Italia;
- Distretto Tecnologico Nazionale sull'Energia (Di.T.NE.);
- E.DSO Bruxelles (European Distribution System Operators' Association for Smart Grids);
- Elettricità Futura ("Future Electricity" formerly Assoelettrica-AssoRinnovabili);
- Energy and Strategy Group – Politecnico di Milano (Polytechnic of Milan) (ES-MIP);
- EURELECTRIC Bruxelles (Union of the Electricity Industry);
- FAI Fondo per l'Ambiente Italiano (Fund for the Italian Environment);
- FERPI;
- FIRE (Federazione Italiana per l'uso Razionale dell'Energia) (Italian Federation for the Rational Use of Energy);
- FISE Assoambiente;
- Fondazione Global Compact Network Italia (Global Compact Network Italy Foundation);
- Fondazione Roma Europa;
- Fondazione Utilitatis (Study and Research Centre for Water, Energy and the Environment);
- Gruppo Galgano;
- IATT (Italian Association for Trenchless Technology);
- ICESP Piattaforma Italiana Economia Circolare coordinata da ENEA;
- I-Com (Istituto per la Competitività – Institute for Competitiveness);
- IGI (Istituto Grandi Infrastrutture);
- InnovUp;
- ISES Italia (International Solar Energy Society – Italian Section);
- Laboratorio dei Servizi Pubblici Locali di REF-Ricerche (Local Public Services Laboratory of REF-Ricerche);
- NORMAN NETWORK;
- Italian Phosphorus Platform coordinated by AENEA and MATTM;
- Servizi Professionali Integrati;
- UNI (Italian Standards Body);
- Unindustria Lazio;
- UPA Utenti Pubblicità Associati;
- Utilitalia (Federazione delle imprese ambientali, energetiche ed idriche) (Federation of Environmental, Energy and Water Companies);
- UNICHIM;
- World Energy Council (WEC).

Acea participates in occasions for dialogue with the business world and the scientific community on issues of national and international importance and offers its own specialist contribution on the occasion of thematic conferences, forums and workshops on topics linked to its managed companies, also presenting publications and works of technical-scientific relevance. In particular, during the year it built a network of relationships with universities, research centres, technology partners, startups and SMEs to strengthen its national and international presence in the field of innovation.

The Group participated in events and organised numerous initiatives, predominantly implemented digitally as a result of the pandemic, which have already been mentioned (see the chapters *Customers and the community*, paragraph *Communication, events and solidarity*, *Strategy and sustainability in Corporate identity* and the section *Relations with the environment*). Here, only the **Sustainability day**, as an occasion for discussion and debate among representatives of institutions and sustainability experts with regard to the challenges facing the green evolution of networks and cities in the time of Covid-19, **Ecomondo**, within the framework of which there has been a growing drive towards sustainability and a concrete commitment to protect and build *smart cities* characterised by technological innovation and the green and circular economy, **Maker Faire Rome**, the largest initiative in Europe devoted to innovation, which this year concerned new technologies and innovative projects for redesigning the future of water and the environment, **SMAU**, the event dedicated to innovation for businesses and the public administrations, in the context of which Acea won the “SMAU Innovation Award” for the second time with the Waidy project.

With regard to sustainability issues, Acea participates in **networks of experts, working groups, studies and sector research** organised by the academic world, civil society, institutions or business entities. Indeed, the Company is active as an associate in the **Global Compact Network Italy Foundation**, the representative body of the United Nations Global Compact in Italy, and in the **CSR Manager Network**, the national association that brings together the main Italian companies active in *corporate social responsibility*.

Acea’s participation in **Utilitalia**, the federation that brings together the *multi-utilities* of water, environment, energy and gas, is also expressed through its participation in **technical panels and topical working groups, including the one dedicated to Sustainability**.

The Company also participates in benchmark analyses on sustainability in Italian *Utilities*, like those carried out by the **Utilitatis** research centre and **Top Utility**.

Acea took part in the **Energy, Environment and Sustainability Tech-**

Panel for the preparation of the **Manifesto for Energy and Sustainability**, which was delivered to the Italian Minister for Innovation and the Chair of the Council Presidency’s Italia Benessere Steering Committee.

In addition, in 2020 together with its Parent Company’s sustainability representatives, **Acea SpA’s Innovation Unit participated, in the working group on “Innovation and Sustainability” organised by Assonime**, the relevant association of joint stock companies, within which a *paper* was drawn up on how the two issues are related in the business context. To that end, some best practices that Acea has implemented in the **innovative “as a service” model**, the **corporate entrepreneurship** programme and, above all, the **lean procurement processes for startups and innovative SMEs**, as a testament to the competitive sustainability of small-scale suppliers with high technological potential; the most innovative projects with a significant impact in terms of sustainability, such as e-mobility and Acea SmartComp, were also presented.

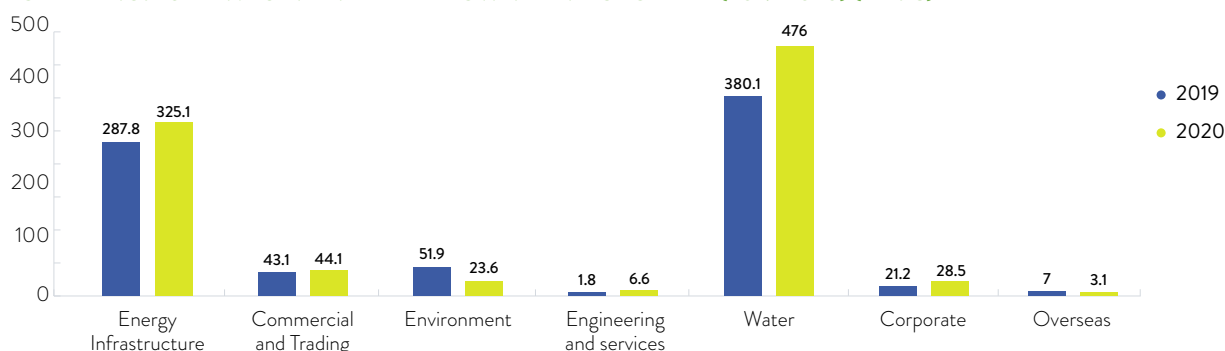
THE COMPANY AS A STAKEHOLDER

THE MANAGEMENT OF COMPANY ASSETS

Acea protects and enhances its tangible and intangible assets, seeking a sustainable financial position and **governing the internal needs**, linked to the operating management and the **growth prospects**, consistently with the aims expressed in the business mission and the strategic plan.

In 2020 **investments** totalled **€ 907 million, up 14.4%** (€ 792.8 million in 2019). These were distributed by business segment as follows: € 23.6 million for the **Environment** segment, in particular for the revamping of the 4th San Vittore line, for works on the Aprilio plants and the landfill in Orvieto; € 44.1 million for the **Commercial and Trading** segment, especially on activities related to the acquisition of new customers and for IT implementation and licensing projects; € 476.9 million for the **Water** segment, due to the investment plan distributed throughout the entire water cycle supply chain and the main companies and AdF’s consolidation; € 6.6 million for the **Engineering** segment which takes account of SIMAM’s consolidation; € 325.1 million for the **Energy Infrastructure and Generation** segment, partly earmarked for works on MV/LV networks and works on substations and meters and partly earmarked for maintenance works on some power plants. The value also includes photovoltaic plant construction activities. Finally, the **Parent Company** and **Overseas** with investments for about € 28.5 million and € 3.1 million, respectively.

CHART NO. 45 – INVESTMENT BREAKDOWN BY MACROAREA (2019-2020) (mln. €)



Depreciation, amortisation, provisions and write-downs amounted to **€ 620.5 million** (19.5% higher than 2019 restated). The increase in depreciation and amortisation is associated, net of the changes in the scope, with investments in the period in all business areas and also took into account the developments connected with the technological platform common to the ACEA Group. The effect of the acceleration of depreciation (started at year-end 2019) of first-generation electrical meters plays a part. The increase in the item impairment of receivables is mainly attributable to Areti, which in 2019 benefited from the positive effects following Resolution 568/2019/R/eel which provided for the recovery of the portion related to the network tariffs. The provisions for risks have decreased by € 5.0 million.

THE COMMITMENT TO RESEARCH AND INNOVATION

Scientific and technological innovation at the service of business processes is one of the **pillars** of the **Group's strategic planning**, which in 2020 invested more than **€ 13 million on this aspect**.

To manage **the Group's innovative direction**, the Company **Acea Innovation** was reorganised throughout the year, with the *mission* of enabling the Group's design and innovative initiatives and generate products and services for the business (B2B) and institutional (B2G) markets. In 2020, activities were mainly focused on electric mobility, and Acea SpA's **Technology & Solutions Department** was strengthened, with the *mission* of developing and implementing infrastructures, systems, products and services in the technological, innovative and digital arena, directing and coordinating preparatory activities for the creation of products and services in market segments of interest.

At Acea, **innovation** is a **cross-sectional** strategic lever that is **open** to the external ecosystem; through its innovative approach, the Company aims to **explore new businesses** and create new development models.

The **Innovation Model** identifies the **Group's internal needs and seeks innovative solutions, adopting processes and approaches typical of Open Innovation**, with the **collective generation of ideas** and the involvement of internal and external stakeholders, starting with the conception process, moving on to the trialling of the design concept, to the implementation of the projects. According to this logic, the **promotion of the Group's culture of innovation and the development of internal entrepreneurship are fundamental** and to that end a dedicated *crowdsourcing* platform was created, which collects employees' design ideas and creates a Company space for active involvement.

Also present is the **Innovation Board**, made up of innovation representatives from the various industrial entities, which, in a shared manner, defines and creates the Group's innovation strategy.

To render the approach to innovation systematic:

- the **Innovation Garage corporate entrepreneurship programme was developed**, which leverages on the entrepreneurial skills of employees;
- **idea generation workshops** are organised to creatively address business and innovation needs;
- internal communities **are active, as experimental spaces in which new tools and languages can be collectively studied and analysed, best practice can be shared, and new projects can emerge**, and include the Data Community, an informal space in which professionals from the various businesses meet and exchange knowledge on issues related to the world of data.

Thanks to the **"Innovation garage"** programme, in 2020 **two projects** focusing on the **improvement of customer experience** and **appreciation for water resources** were implemented. One of these is the Waidy project, an app that can be downloaded

from all app stores, **which makes it possible to geolocate public water supply points**, access additional information, and report any faults in real time in terms of the qualitative and quantitative parameters of the water supplied (also see the chapter on *Customers and the community*).

In 2020, **four workshops on issues of interest in the commercial and water sectors, on sustainability, and on data management** were organised digitally. They included:

- the **machine learning workshop** for the Data Community, based on learning-by-doing, with the aim of exploring the potential of machine learning through the development of technical skills in Python, one of the most commonly used programming languages in the world;
- the **SDG Lab course**, with **creative sessions for Group employees** invited to contribute with **ideas and initiatives for Acea's commitment to the main UN Sustainable Development Goals (SDGs)**, generating awareness of the roles that sustainability and innovation have in the creation of shared value.

Valid design concepts emerge from these workshops, and are then developed and implemented by the Company. One of these made it possible to create the **LabSharing platform** for the external sharing of know-how and instruments at Acea's cutting edge (see the *Research and innovation at Acea SpA* box below).

In addition, the Innovation Model provides for the use of the **innovation factory**, a versatile **market analysis, continuous scouting and partnership development** format, used at the national and international levels, **with actors from the innovation ecosystem engaged in sectors of strategic interest to the Group**. Thus, Acea is able to activate privileged channels to access ideas, business and technological opportunities, academic research and new talent to innovate businesses, processes and Company projects. For similar reasons, 2020 also saw the confirmation of involvement in **Startup Europe Partnership**, an Open Innovation programme that puts European scaleups into contact with corporates, and **Elis Open Italy**, the co-innovation programme to combine the innovation needs of companies in the consortium with the offer of startups, innovative SMEs, university spin-offs and research centres.

To intercept innovative trends, scenarios and projects, and discover new suppliers and business partners, Acea has renewed its partnership with **Milan Polytechnic University's Digital Innovation Observatories**, a benchmark of digital innovation in Italy in Italy, participated in the **Artificial Intelligence Observatory**, a discussion-based community for investigating the true potential of Artificial Intelligence, and for the first time became involved in the **Space Economy Observatory**, to explore the technological opportunities and business impacts of the Space Economy and experiment with space technologies.

In addition, the **collaborative projects with Talent Garden**, to develop collaboration on digital transformation and corporate innovation projects, **and with Roma Startup**, the association created to consolidate Rome's startup and innovation ecosystem, were renewed. Lastly, over the year, **ACEA joined Innov-Up, (formerly Italia Startup)**, a non-profit association that represents the ecosystem of Italian start-ups, widened to all private and public bodies, which facilitates the enhancement, visibility and growth, to favour the creation of a new Italian entrepreneurial fabric, **and ANFOV**, an association that promotes discussions between all business and institutions involved on the telecommunications sector and monitors, analyse and promotes the development of the contiguous ICT scenarios.

Finally, **Acea is a partner of the Italian National Young Innovators Association (ANGI)** and, as part of the “National ANGI Award”, collaborates in the awarding of the special “Innovation Leader Award” for young talent in the world of innovation.

In recognition of the results achieved by Acea in the field of innovation, **in 2020 the Company won prestigious awards** (see the box for more details).

AWARDS IN THE FIELD OF INNOVATION

Acea’s commitment to innovation has been recognised by important institutional initiatives. In December, the Company was awarded the “**Premio dei Premi**” [Prize of Prizes]: this award, instituted by the **Presidency of the Council of Ministers on behalf of the President of the Republic**, is conferred annually on companies, industrial groups, public administrations and research bodies that have achieved significant product or process innovation. In particular, the award recognises Acea for having given “*evidence of a structured approach to innovation that has led to the definition of an ‘Innovation Board’ and two organisational units for innovation, in support of corporate strategies*”.

The Company also won the “**Premio Imprese per Innovazione**” [Enterprise Award for Innovation], now in its 11th edition, **promoted by Con-**

findustria. This award is given to organisations that have successfully invested in research. The ‘Enterprise Award for Innovation’ participated in the ‘Industry and Services’ section of the above-mentioned ‘Prize of Prizes’. Acea has thus distinguished itself as one of the three large Italian companies that have most distinguished themselves for their work and achievements in innovation in recent years. CEO Giuseppe Gola said: “*Innovation is an **integral part of the Group’s strategy, in terms of technological evolution and as a value that is shared at every level of the Company. We see the future in innovation.** This is why at Acea we are experimenting with an open, shared and participatory culture of innovation, which is a lever to evolve our services and improve the lives of millions of people in our areas of operation.*”

With reference to the Group’s industrial processes and infrastructure, the following boxes illustrate, by way of example, the main **research and innovation projects** carried out in 2020 by Acea SpA’s Technology and Solutions Department, Acea Innovation, Acea Elabori and the Group Operations. We also recall what has already

been illustrated in the paragraph *Relations with institutions*, and in particular in the sub-paragraphs *Some projects for the development of the territory* and *The comparison with the reference context*; also see the chapter *Customers and the community* and the section *Relations with the environment*.

RESEARCH AND INNOVATION AT ACEA SPA

In 2020, **Acea SpA’s Technology & Solutions Department**, initiated and/or carried out **the following experiments** with the involvement of all Company entities and external start-ups:

- the implementation of the “**UFirst**” **project**, a full digital booking system for the water companies’ public branches, in particular Acea Ato 2, which was adopted as an anti-crowding solution in the emergency context;
- the activation of a remote helpdesk service for all ADR operatives in **video call mode with augmented reality**;
- the creation of **dynamic dashboards updated in real-time** to identify land displacement in the vicinity of Acea’s strategic assets;
- the creation of **data-driven tools** for correlating primary substation failures with the time taken to identify the cause of the failure;
- the implementation of **artificial intelligence devices in Company vehicles** to map assets, territories and improve in-car safety;
- the creation of a **new navigable web bill** for water, to be activated in 2021;
- the **detection of water leaks** using technologies developed by two innovative start-ups;
- the launch of the **Paso project**, in collaboration with the M2D startup technologies, for the **improvement of the medium volt-**

- **age fault selection process** on the electricity distribution network, which can be achieved by replacing human operations with a synthetic automatic logic, **using data driven techniques**. To this end, clusters relating to fault selection manoeuvres and representative samples were identified in order to carry out *what-if analysis* and benefit estimation, comparing the efficiency and effectiveness of field operations with that obtainable from synthetic logics; the analysis was concluded with excellent results, enabling identification of recurrent causes for the fault selection classes;
- the launch of the “**Safety check**” **project** at the sites managed by Acea Elabori to remotely check the safety conditions of personnel working at the sites, as well as compliance with the provisions issued by the Employer on health and safety matters. The system detects potentially hazardous situations and returns an alert through the use of special IoT sensors in the field, representing a valuable tool to help further improve the Company’s security standards (see also the chapter on *Suppliers*);
- the implementation of the “**Bonifische anagrafiche**” [Master Reclamation] **project**, a data retrieval system able to retrieve customer master data, thanks to machine learning and artificial intelligence, and automate internal data quality processes (see also the chapter on *Suppliers*).

RESEARCH AND INNOVATIVE SOLUTIONS IN ACEA INNOVATION

Acea Innovation was particularly active in 2020 on the **electric mobility** front and, through the Company Electric Drive Italia, acquired in May,

completed the development of the Charging Point Operator platform and made the Mobility Service Provider platform available to Acea Energia.

RESEARCH AND INNOVATION IN NETWORKS OPERATIONS AND GENERATION

In 2020, **Areti**, as part of its electricity distribution activities, launched or implemented several innovative projects, including:

- the **“PlatOne” project**, funded by the European Community, coordinated by the Company and involving 12 partners from Germany, Belgium, Greece and Italy, which promotes a **new approach to managing distribution networks** that makes them **more stable in the presence of large loads of energy from variable renewable sources**, through the use of flexibility measures, storage and demand response services, with smart grid technologies and tools for the automation and control of the network and distributed energy sources;
- The **POLEDRIC project**, for the development and implementation of an innovative technological solution, aimed at the realisation of a “smart pole”, which will be applied to the public lighting poles of the city of Rome; the IP pole will be equipped with a device able to improve the public lighting service (through sensors and the use of advanced technologies) and enable additional environmental, security and communication services (environmental sensors, traffic and parking monitoring sensors, video surveillance and video analysis services, etc.), in a smart city perspective;
- the **“G.I.M.I.” project** (Massive and Targeted Infrastructure Inspection Management), to **reduce undiscovered faults on overhead lines** and asset monitoring, through periodic analysis of satellite images

- and targeted drone inspections;
- the **‘AUTONOMOUS’ project**, to **reduce the incidence of faults in the primary substation**, by means of preventive inspections either autonomously or remotely guided by a UGV (Unmanned Ground Vehicle) drone;
- the **“Automa per Selezione Guasto in TLC”** [Automated Fault Selection in TLC] **project**, aimed at supporting and **automating human operations, with Robotic Process Automation techniques**, from a remote controlled central fault selection system on the network;
- the **“4G Automation” project**, aimed at implementing a **field automation solution for fault selection** using the 4G network, which is much more pervasive and immediately usable compared to fibre optics.

Acea Produzione continued the **technical-economic feasibility study for the creation of a battery-based electricity storage system**, evaluating the integration of storage equipment with large photovoltaic plants under development, including for providing network services on TERNA’s ancillary markets, and started the installation of the **WONDERWARE SYSTEM PLATFORM software**, aimed at the continuous monitoring of quantities, analysis and extrapolation of information relating to hydroelectric production plants and photovoltaic plants, preparatory to reporting activities, including for statistical and study purposes.

RESEARCH AND INNOVATION IN WATER OPERATIONS

Acea Ato 2 carried out **research activities** and **technological-digital innovation**, with the aim of improving operational performance.

For innovation applied to the management of **water distribution networks**, new-generation techniques were tested – **satellite, noise recorder and fibre optics for searching for hidden leaks** (Noise Logger and Satellite Radar Interferometry) – and the districtisation of **more than 7,000 km of network** was carried out, with the integration of a mathematical model for setting pressure regulation valves and the installation of instrumentation for **advanced remote management**.

With regard to **wastewater treatment**, the main projects concerned:

- the installation of the new ozonolysis station for **sludge reduction** at the Ostia plant, in view of the excellent results already obtained with the testing of the system;
- the **optimisation of the anaerobic sludge digestion compartments**, activated at some of the managed treatment plants, including in relation to the biomethanisation power of the sludge (primary, secondary, etc.);
- the **search for emerging organic micropollutants (EOMs)** to limit their release into the natural environment, as they are potentially hazardous (endocrine disruptors, non-target substances and transformation products).

As part of the protection of **water resources**, **satellite monitoring of safeguarded areas** continued, aimed at detecting morphological changes (new buildings, earthworks, etc.), followed by related verification activities, and **experimentation began on an innovative filtering material to reduce arsenic in water intended for human consumption**.

A technology partner was also selected for the development of the **“Water Management System project (WMS)”**: a user-friendly, multi-channel application solution capable of representing, analysing, monitoring and reporting on huge amounts of data and information from multiple information systems.

With reference to **water purification** activities, at the Grottarossa plant, **Acea Ato 2** conducted studies on the emerging micropollutants present in the treated water (Tiber River) and their outcome in the treatment phases, as well as on the formation of disinfection by-products (chlorine dioxide and sodium hypochlorite).

Acea Ato 5 conducted experiments on:

- **innovative technological solutions aimed at recovering materials from sewage sludge;**

- **satellite leak detection**, with the analysis of images taken to pre-locate water leaks; the images were subjected to algorithmic analysis and the water network was investigated by satellite buffer acquisition.

AdF has strengthened its commitment to research and innovation, **creating a specific dedicated Operating Unit** and launching experiments and research projects on:

- the **qualitative and quantitative characteristics of the water resource of the Santa Fiora springs on Mount Amiata**, the main source of supply under management, through an in-depth study in scientific partnership with the CNR in Pisa - Geosciences and Georesources Institute (IGG);
- **massive remote reading of meters** across the territory through drive-by and walk-by reading, covering around 35% of the installed base of meters;
- the **network data collection platform** (based on Hitachi Lumada), with predictive algorithms and correlations between measurements from innovative sensors installed in the field and remote control and data management platforms already in use;
- the **installation of innovative battery-powered pressure and temperature sensors** with NBloT technology and the related management and measurement analysis platform;
- the launch of the **“WPOM (Wastewater Pumps On-condition Maintenance)” project** for the development of an algorithm to detect anomalies in sewage pumps by processing data from the Wonderware database;
- the construction of a **centralised platform for the treatment of sludge from sewage treatment plants** by means of thermochemical hydrolysis.

As part of the **protection of water resources**, **AdF** has launched **three pilot studies**, which will continue in 2021, to test innovative technologies applied to network management: a **satellite monitoring project to locate water leaks**, a **pressure monitoring and management project**, and the **testing of a predictive methodology** that, based on historical, geomorphological and hydraulic data from the aqueduct graph, can **identify the areas at greatest risk of rupture**.

Gesesa continued the **implementation of the remote control system**, starting with the sewage lifting stations.

Gori has implemented **IoT technologies and advanced sensor technology** for environmental protection, with the installation of 300 sensors and remote monitoring of wastewater flood drains.

RESEARCH AND INNOVATION IN ENGINEERING OPERATIONS

Acea Elabari, with the involvement of all corporate entities, universities and companies in the sector, launched and/or carried out **the following experiments** in 2020:

- the **“Acea Smart Comp” project**, which applies a *waste transition* logic and proposes a new model of **organic waste management**, from large-scale plants to local and widespread waste management;
- the **LabSharing platform**, developed in collaboration with Acea SpA's Innovation Unit and the Company's Laboratory and presented in Rimini at Ecomondo 2020. The online platform will also allow third parties (organisations, universities, research centres) to make use of Acea's structures of excellence and scientific support in the field of highly complex environmental controls. In particular, **the platform allows you to view the analytical offer, arrange for analyses**

on environmental matrices (water, air, soil and others) and **follow the progress of your order** via a dashboard. Eventually, the platform **will turn into a collection of research projects**, through the 'Showcase' section. The key words of the project are sharing, innovation and sustainability: both as a way of working, participating and collaborating, and as an innovative service;

- the development of **a protocol for the detection of SARS-CoV-2** in the wastewater matrix;
- Research into **microplastics in water**, including through the development of Raman spectroscopy methodologies, in collaboration with ENEA;
- the development of **low-cost smart sensors** for community composting (ENEA-funded project).

RESEARCH AND INNOVATION IN ENVIRONMENT OPERATIONS

In 2020 in the Environment Operations the following research and innovation activities are worth mentioning:

- the completion of experimental activities for the development of a plant solution aimed at **recovering sodium bicarbonate and calcium chloride dihydrate** (reaction by-products) from the treatment of Residual Sodium Carbonate (RSC), deriving from the neutralisation phase of the acid fumes produced by the waste-to-energy plants, currently under contract, and the start of activities to define the industrial *scale-up*;
- The completion of **experimental activities for the treatment of fly-ash and bottom-ash** for the recovery of the inert fraction **present** and treatment for the reduction of hazardous char-

acteristics, and initiation of activities to define the industrial scale-up;

- the completion of the feasibility study, carried out with the Polytechnic University of Milan and the National Interuniversity Consortium of Materials Science and Technology, for the implementation of a type of **conversion of the energy content of plasmix** (waste that cannot otherwise be separated from the mechanical sorting processes of plastics) for the **production of methanol** and the definition of the contents of the *Licensing*;
- initiation of the technical-economic analysis and **experimentation of the wet oxidation process of sewage sludge using** Granit Technologies and Engineering's **CleanWOx® technology**.