

Green transition



Priority topics



Policies for the environment

[GRI 102-15]

Sustainable development, also in its connotation of protection of the quality of the environment and rational use of natural resources, is at the centre of Iren Group's attention and is embodied in its business model, mission and growth strategy.

This commitment is also expressed in the Group's Integrated System Policy (Quality, Environment and Safety), which is implemented in full compliance with all applicable environmental regulations, in the optimisation of company processes and in investments in research and innovation, and in activities to sensitize and create awareness of environmental issues among its stakeholders. In particular, the involvement and conscious participation of employees, through information and training activities, is a necessary condition for the implementation of any program of prevention and dissemination of the culture of sustainability and environmental protection.

In order to guarantee the lowest environmental impact of the processes and to implement an adequate operational control, Iren has adopted a structured Environmental Management System (ISO 14001, ISO 50001, UNI CEI 11352, F-GAS certifications and EMAS registrations) (see page 94).

The commitment to environmental protection is made even more concrete by the goals of the 2030 Business Plan, which places **green transition** among its three pillars of future growth, to be implemented through:

- progressive **decarbonization of all activities** through the growth of energy production from renewable sources, innovation of technologies and processes in district heating management, preparation of gas networks for hydrogen transport and reduction of the power generation carbon intensity to achieve the targets validated by Science Based Target Initiative (SBTi) and carbon neutrality by 2040;
- strengthening of the **leadership in the circular economy** through the continuous increase in sorted waste collection, the transfer of the Group's best practices to newly acquired areas, the investment in automation and digitalisation and the development of new plants in the material recovery chain that will also allow the production of biomethane from the organic fraction of waste;
- the **efficiency of the integrated water service**, significantly reducing network leaks, with a consequent reduction in the consumption of water and energy resources, increasing the wastewater treatment capacity and reuse of purified water.

Production processes and environmental impacts

Iren Group activities that lead to environmental impacts include:

- **production of energy**, hydroelectric and thermoelectric (cogeneration and traditional plants, integration and reserve plants);
- management of **electricity distribution** networks (high, medium and low voltage and transformer substations), and **natural gas** distribution networks;
- · management of the integrated water service;
- · waste collection, recovery and disposal services;
- other customer services (including energy efficiency products and services, electric mobility);
- environmental practices of contractors, and other suppliers of the Group.

Resources are used in these operating areas for the management of operating activities and outputs and impacts are generated, as illustrated in the following diagram.



Investments for the environment [GRI 203-1]

The expenses and investments incurred in 2021 for environmental protection amount to approximately 600 million Euro, allocated as follows:

- 53% to the construction of new wastewater treatment plants, to the efficiency of water supply networks, to the cathodic protection of gas networks, to smart metering and to the strengthening of substations and plants of the electricity distribution networks;
- 33% to the optimisation of sorted waste collection systems in order to pursue the waste recovery objectives defined in the local area plans;
- 10% to the development of energy production from renewable sources, electrical and thermal storage, district heating networks, the efficiency of production plants through flexibility interventions;
- 4% to the implementation of services and products with positive environmental impacts for customers.



Decarbonization and process efficiency

[GRI 302-1, 302-2, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5, 305-6, 305-7, G4-EU1, EU2]

Direct and indirect energy consumption

The **direct energy consumption** of the Group concerns the use of fuels for the production of electricity and heat (cogeneration plants, thermal plants, boilers, waste-to-energy plants and landfills), and the non-renewable primary energy flows not directly associated with the production of energy (i.e. site heating, fuel for the vehicle fleet, etc.), used in carrying out its activities. Energy consumption decreased slightly compared to 2021, despite the expansion of scope of consolidation.

Indirect energy consumption refers to the electricity purchased and consumed by the Group, both for its offices and production plants. The electricity used by the energy production plants is self-generated and can be partly purchased from third parties, if the needs exceed self-generation. In 2021, indirect energy consumption is 402 GWh, equivalent to 75,250 TOE (3,149,964 GJ), an increase of 19% compared to 2020 mainly due to the expansion of the corporate scope.

In its Business Plan, the Group has set a target of 100% of electricity certified from renewable sources purchased by 2030, with intermediate targets of 2024 (90%) and 2026 (95%). To this end, at the beginning of 2021, existing contracts were renegotiated and electricity from renewable sources was purchased, certified through Guarantee of Origin (GO), covering 83% of the total purchased.



| Direct energy consumption by energy source | u.m. | 2021 | 2020 | 2019 |
|---|---------------------|------------|------------|------------|
| Natural gas | scm/000 | 1,689,348 | 1,723,470 | 1,779,273 |
| | TOE | 1,412,295 | 1,440,821 | 1,487,472 |
| Discol fuell | t | 62 | 44 | 36 |
| Diesei Tuel | TOE | 63 | 45 | 37 |
| Biogas from landfills, treatment plants and | m ³ /000 | 32,152 | 30,443 | 28,399 |
| biodigesters | TOE | 11,984 | 11,497 | 10,475 |
| Fuel for motor vehicles | t | 11,849 | 10,643 | 11,481 |
| Fuel for motor venicles | TOE | 12,137 | 10,900 | 11,759 |
| Total | TOE | 1,436,479 | 1,463,262 | 1,509,743 |
| | GJ ² | 60,142,518 | 61,252,146 | 63,197,819 |

¹ The 2021 figure shows an increase due to extraordinary maintenance at waste-to-energy plants.

² Conversion to GJ is done using the conversion factor 1 TOE = 41.868 GJ.

Atmospheric emissions

The emissions of greenhouse gases (GHG) are produced by Iren Group directly in the production processes (scope 1) and indirectly both through the possible supply of electricity from third-parties (scope 2) and along the value chain (scope 3).

In this report they are considered and counted as CO₂ equivalent emissions:

- **scope 1**: all direct emissions produced by sources owned by the Group, i.e. the CO₂ emissions generated by the combustion of fuels and waste for the production of energy and heat, those originating from the fleet of company vehicles, fugitive methane emissions from gas distribution networks and landfills, those related to fluorinated gases and those deriving from the consumption of fuels for heating the buildings of the various offices and for other activities to support production;
- **scope 2**: CO₂ emissions deriving from the Group's indirect consumption, i.e. the emissions generated by electricity purchased from third-party suppliers and consumed both in the Group's plants and offices;
- **scope 3**: all emissions which, although connected to core and business activities, are not directly controlled by the Group but are produced in Iren's value chain, both upstream and downstream.

In 2021, a further timely and in-depth review of the GHG emissions inventory was carried out in order to consolidate the mapping of the Group's emission sources, also with the aim of submitting emission reduction targets to Science Based Target Initiative (SBTi) validation. By virtue of this revision, the following have been incorporated into the inventory:

- **fugitive emissions** related to the dispersion of methane gas into the atmosphere in the gas distribution service. To reduce this type of emissions and guarantee the safety of the service, the Group adopts distributed monitoring systems (remote controls), anti-intrusion systems, the continuous planned search for leaks and the ordinary and extraordinary maintenance of networks and substations;
- emissions related to **methane leaks** into the atmosphere produced by the decomposition processes of organic waste disposed of in landfills;
- emissions of fluorinated gases, reported under other direct emissions, which include SF6 (sulphur hexafluoride), an insulating gas used in electricity distribution infrastructure, and refrigerant gases, normally contained in air conditioning/refrigeration systems serving company premises.



Total GHG emissions (tCO_{2eq})



The decarbonization strategy adopted by the Group has led to the definition, in the Strategic Plan to 2030, of significant targets for the reduction of GHG emissions that affect production processes, procurement and commercial policies:

- the reduction of the carbon intensity of energy production (scope 1);
- the zeroing of scope 2 emissions, calculated according to the market-based method of the GHG Protocol, which takes into account the type of electricity purchased by the Group (e.g. certified from renewable sources through Guarantee of Origin);
- the reduction of scope 3 emissions related to the use of products sold (category 11 of the GHG Protocol) and scope 3 emissions related to energy purchases (category 3 of the GHG Protocol).



Scope 1 emissions

| Direct GHG emissions - Scope 1 (tCO _{2eq}) | 2021 | 2020 | 2019 |
|---|-----------|-----------|-----------|
| Production plants ¹ | 3,764,218 | 3,856,284 | 3,917,267 |
| of which cogeneration, thermal and thermoelectric power plants | 3,333,617 | 3,418,020 | 3,484,516 |
| of which waste-to-energy plants (non-biogenic portion) | 430,573 | 438,232 | 432,720 |
| of which combustion reactions for process uses or services | 28 | 32 | 31 |
| Company vehicles ^{2,3} | 19,978 | 18,555 | 20,517 |
| Gas distribution network ⁴ | 22,699 | 21,039 | 21,438 |
| Landfills ⁵ | 163,106 | 166,025 | 161,367 |
| Other emissions (heating, air conditioning, and other production support activities) ^{2, 6, 7, 8} | 8,361 | 7,126 | 7,134 |
| Total | 3,978,362 | 4,069,029 | 4,127,723 |

¹ The fuel emission coefficients published in the 2021 National Standard Parameter Table of the Ministry of the Environment and the Protection of the Land and Sea were used.

 $^{\scriptscriptstyle 2}$ The data for 2020 has been restated.

³ INEMAR - ARPA Lombardia (2018) emission coefficients were used.

 $^{\rm 4}$ A gas leakage rate value of 0.1% and methane GWP of 28 were assumed.

⁵ Methane GWP of 28 was used.

⁶ The data for 2019 has been restated.

⁷ Fuel emission coefficients published in the 2021 National Standard Parameters Table and specific GWPs for individual fluorinated gases were used.

⁸ Emissions of ozone-depleting substances, expressed as tCO_{2err}, are included.

| Direct biogenic CO ₂ emissions (tCO _{2eq}) | 2021 | 2020 | 2019 |
|---|---------|---------|---------|
| Waste-to-energy plants | 448,147 | 456,119 | 450,383 |
| Landfills and wastewater treatment plants | 32,796 | 24,915 | 21,444 |
| Total | 480,943 | 481,034 | 471,827 |

Power generation carbon intensity stands at 323 gCO_{2eq} /kWh in 2021 (the index is calculated according to the methods provided by SBTi considering all scope 1 emissions from energy production plants, related to the total electricity and heat produced), an improvement of 3% compared to 2020, mainly due to lower thermoelectric production, which had recorded an exceptional increase in 2020, and the increase in energy generated by cogeneration plants and waste-to-energy plants.



The objective set out in the Group's Business Plan is to reduce the power generation carbon intensity to 176 gCO_{2eq} /kWh in 2030. The path, defined for the achievement of this objective, includes several variables: industrial, such as the development or acquisition of renewable sources for energy production, of scenario, such as the availability of hydrogen and renewable gases that allow the use of fuel blends to replace natural gas alone, and technological, such as the capture and storage of CO_2 emitted by plants.

| Scope 2 emissions | | | | |
|---|---------|---------|---------|--|
| GHG emissions - Scope 2 (tCO _{2eq}) | 2021 | 2020 | 2019 | |
| Location-based methodology ¹ | 111,869 | 99,720 | 105,583 | |
| Market-based methodology ² | 31,074 | 154,472 | 155,664 | |

¹ The location-based methodology considers the average emission intensity of the networks where energy consumption occurs (using primarily network average emission factor data). Emissions are therefore obtained by multiplying the electricity purchased from third-parties by the emission factor of the national electricity mix, which for 2021 is equal to 278 kgCO₂/MWh, for 2020 it is equal to 296 kgCO₂/MWh and for 2019 is 316 kgCO₂/MWh (Source: Italian National Inventory Report 2021, ISPRA). This factor accounts for the mix of various production sources for the purchased electricity.

² The market-based methodology considers the emissions of the type of electricity the company has chosen to purchase. The emissions are, therefore, obtained by setting at zero emissions the share of purchased electricity from renewable sources certified by Guarantee of Origin and multiplying the share of purchased electricity from non-renewable sources by the emission factor that refers to the national residual mix, which for 2021 is considered to be equal to the value for 2020 (pending publication of the updated value) i.e. 458.57 kgCO₂/MWh, and for 2019 is 465.89 kgCO₂/MWh (Source: European Residual Mixes, AIB). This factor considers the residual mix of the various sources of production of the purchased electricity, net of the portion certified by the Guarantee of Origin.

Compared to the prior year, 2021 shows a 12% increase in scope 2 location-based emissions related to the increase in purchased electricity by the Group under the scope expansion. The strong reduction in scope 2 market-based emissions reflects the Group's strategy to increase the purchase of electricity from renewable sources certified by Guarantees of Origin (GO), with the aim of reaching 100% by 2030, thus bringing the value of scope 2 market-based emissions to zero.



The Group has set a target of zero scope 2 market-based emissions by 2030 by purchasing 100% green energy





Scope 3 emissions

The Group is indirectly responsible for emissions produced by its suppliers and customers and by the entire value chain. This is why it is committed to constantly refining the scope 3 emissions reporting scope.

Overall, in 2021, scope 3 emissions are up on 2020 due to the increase in total order by approximately 23%, also due to the expansion of the Group's scope, and the refinement of calculation methodologies in the GHG inventory review.

| GHG emissions – Scope 3 (tCO _{2eq}) | 2021 | 2020 | 2019 |
|--|-----------|-----------|-----------|
| Purchased goods and services ^{1,2} | 993,814 | 765,777 | 549,970 |
| Capital goods (plants and machinery) ¹ | 7,190 | 3,256 | 38 |
| Fuel- and energy-related activities not included in Scope 1 or 2^3 | 629,999 | 480,459 | 499,719 |
| Upstream transport and distribution ^{1,2} | 107,164 | 35,389 | 636 |
| Waste generated in operations ^{2,4} | 57,759 | 75,379 | 1,492 |
| Business travel⁵ | 220 | 137 | 52 |
| Employee commuting ⁶ | 12,750 | 12,750 | 12,750 |
| Use of products sold ⁷ | 2,673,920 | 2,464,655 | 2,519,909 |
| Downstream leased assets ⁸ | 9,268 | 8,602 | 7,806 |
| Investments ^{2,9} | 205,715 | 241,472 | 41,400 |
| Total | 4,697,799 | 4,087,876 | 3,633,772 |

¹ All orders placed with suppliers during the year are analysed and emissions related to each type of goods, services and capital equipment purchased are estimated using the GHG Protocol's Quantis Scope 3 Evaluator tool.

² The data for 2020 has been restated.

³ Emissions are calculated using Well-to-Tank (WTT) UK Government GHG Conversion Factors for Company Reporting, which quantify emissions associated with the extraction, processing, and transportation of purchased fuels and electricity.

⁴ Emissions generated by the disposal of waste produced by the Group have been estimated, using emission factors from the Ecoinvent 3.7.1 database reprocessed using Simapro software.

⁵ Emissions from business travel are calculated through the Group's travel agency (which handles all employee travel), which performs the environmental impact analysis. For the calculation of CO_{2eq} emissions, all services booked through the travel agency portal (plane, train, rentals, hotel) are considered.

⁶ Estimated on the basis of the average number of employees (range of 5,000 to 10,000) using the GHG Protocol's Quantis Scope 3 Evaluator tool.

⁷ Volumes of gas delivered to end customers multiplied by the emission factor related to the combustion of the gas are considered.

⁸ Calculated based on the value of rental and lease income earned using the GHG Protocol's Quantis Scope 3 Evaluator tool.

⁹ Estimated for investee companies not consolidated on a line-by-line basis using the GHG Protocol's Quantis Scope 3 Evaluator tool. The estimate is based on the annual revenues of the companies and the proportional share of Iren Group's investment in each company.

The Business Plan targets include a 25% reduction in scope 3 emissions related to the use of sold products (category 11) and a 13% reduction in scope 3 emissions related to fuel- and energy-related activities not included in scope 1 or 2 emissions (category 3).

Emissions related to the use of sold products refer to those due to combustion, by the end user, of the natural gas distributed in the Group's networks.





The reduction, foreseen by 2030, takes into account scenario analyses that consider aspects such as: the progressive electrification of consumption, the reduction in demand for natural gas for heating due to the rise in average temperatures, the market penetration of hydrogen and renewable gases. The item related to the purchase of fuels and electricity quantifies the emissions produced to extract, process and transport the fuels and electricity purchased by the Group. This type of emission is also expected to decrease as a result of both a reduction in the Group's consumption, thanks to activities planned to minimise the power generation carbon intensity, and changes in emission factors.

Other atmospheric emissions from production plants concern sulphur oxides (SO_x) , nitrogen oxides (NO_x) , and particulates.

| Atmospheric emissions (t) | 2021 | 2020 | 2019 |
|------------------------------|------|-------|------|
| SO _X ¹ | 43 | 63 | 25 |
| NO _x | 969 | 1,030 | 996 |
| Particulates | 10 | 11 | 10 |

¹ The data is calculated from the flue gas volume at the stack and the concentration measured by the emission analysis performed by an accredited external laboratory. The determined parameter, which describes the condition of a short period, is then extended to the whole year. This method of calculation may lead to significant differences from one year to the next.



Nearly 2.8 million tons of CO_{2eq} avoided by eco-friendly energy production, sorted waste collection, material recovery and numerous other initiatives

Emissions avoided by processes

The Group carefully monitors atmospheric emissions (measurements on chimneys, indirect calculations, number of leaks, etc.) in order to identify specific measures to reduce them and verify the results achieved on a regular basis.

The generation of electricity from renewable sources creates significant positive effects on the reduction of emissions and the predominant cogeneration framework (production of electricity and thermal energy that feeds the district heating networks) of the Group's thermoelectric plants significantly contributes to containing specific greenhouse gas emissions.

All power generation plants are fuelled by renewable energy sources, waste or natural gas and adopt low-emission and pollutant-reducing combustion technologies (catalysts to reduce CO and NO_x). Continuous emission monitoring systems make it possible to detect in real time the main pollutants and the improvement of the efficiency of the combustion process of cogeneration plants, larger thermal plants and waste-to-energy plants. The latter are also required, pursuant to the relevant Integrated Environmental Authorisations (IEA), to comply with stricter emission limits than those contained in national legislation.

Pursuant to the I.P.P.C. environmental legislation and relevant IEAs, it is mandatory for power plants with a capacity exceeding 50 MW to continually improve waste management services, by updating to the best available technology in order to continually reduce the pollution for the different environmental matrices, including atmospheric emissions.

The combustion of the biogas produced in landfills produces the maximum reduction of methane and other greenhouse gas emissions, although its conversion into CO_2 has a potential greenhouse effect 28 times lower than methane.

In addition to monitoring and limiting emissions of power plants, Iren Group is increasingly contributing to reducing CO_2 emissions through specific investments and projects, such as:

- heat storage systems that absorb the production capacity of plants during periods of low demand and reuse it to efficiently manage peak demand;
- **district heating** that uses heat produced in cogeneration, replacing traditional condominium boilers and reducing the natural gas consumption;
- sorted collection and material recovery from waste which allow to avoid emissions that the materials would have produced if sent for disposal and generate a positive impact on the environment, for example, through the reuse of plastics, including as a substitute for fossil fuels, and the production of compost and biomethane from organic waste;
- **sustainable mobility** and reduction of employee travel through smart working and agile ways of working.

Total emissions avoided in 2021 by adopting the listed initiatives are summarized in the graph below:



 CO_2 emissions avoided (t CO_{2eg})

¹ The calculation considers as a benchmark the emissions of the national thermoelectric system equal to 452.268 kgC0₂/MWh in 2021, 457.059 kgC0₂/MWh in 2020 and 479.01 kgC0₂/MWh in 2019 (Terna and PNA data). Data also include emission reductions from heat storage systems.

² The calculation considers emission reductions from hydroelectric and photovoltaic plants, compared with the conventional thermoelectric mix.

 3 CO₂ avoided from waste takes into account: – production from biogenic sources: electricity produced from biogas (landfills and biodigesters), electricity and heat produced by WTE, assuming 51% of the total production of WTE as a renewable source (Source: GSE) and, in the event that there is also production of thermal energy, converting thermal energy into electrical energy according to specific factors (for PAI = 1/6.88, for TRM = 1/4.5, for Piacenza = 1/6) and applying the national reference parameter (see note 1); – sorted waste collection: correlation between the most significant tons of recycled waste (paper and cardboard, plastic, organic and green, wood, iron, glass) and the tons of CO₂ equivalent saved (Source: Waste management options and climate change EC-AEA 2001); – material recovery: the emissions avoided by the primary materials recovered in Group plants that have been diverted from incineration (plastic, durable goods, other materials) or by the secondary raw material produced by their recovery (compost, *bluair*).

⁴ The calculation takes into account the amount of biogas from the wastewater treatment plants from which electricity was produced.

⁵ Internal Group initiatives were considered (e.g. energy efficiency of plants/processes, electric mobility).

In the Business Plan to 2030, the Group expects to avoid almost 2.3 million tons of CO_{2eq} emissions thanks to sorted collection and recovery of materials and energy from waste.



| NO_x and SO_x emissions avoided ¹ (t) | 2021 | 2020 | 2019 |
|--|------|------|------|
| Nitrogen oxides (NO _x) | 546 | 467 | 690 |
| Sulphur oxides (SO _x) | 229 | 271 | 435 |

¹ The calculation considers emissions that, for the same amount of energy produced, would have been generated by domestic heating systems and the national electricity production network, subtracting the emissions effectively produced by the Group's plants.



Energy production

The Group's power production plants consist mainly of hydroelectric and photovoltaic plants that use renewable sources and combined cycle cogeneration thermoelectric plants, which are some of the most efficient technologies currently available on the market. Furthermore, cogeneration is connected to the urban district heating network, which, compared to traditional heating systems, allows for reductions in energy consumption and improves environmental performance.

In 2021, Iren Group produced 9,823 GWh of electricity, more than 76% from renewable sources (water, solar, biomass or waste) and high efficiency cogeneration.

The significant change in terms of electricity production compared to 2020 is recorded in the contraction of production from thermoelectric power, i.e. from the Turbigo plant, which had recorded exceptional production in 2020. On the thermal energy side, the overall growth of 13% over 2021 is due to increased production from cogeneration plants and waste-to-energy plants.



Producing energy from hydroelectric, photovoltaic and cogeneration plants reduces environmental impact

The objectives of the Strategic Plan to 2030 provide for an increase in installed capacity from renewable sources in order to reach a total capacity of 2.8 GW. To increase the installed power of the hydroelectric plants, the projects for the reactivation of the Noasca (TO) and Giffoni (SA) plants and for the installation of the generator unit at the San Mauro (TO) dam cross-section.



| Net energy output | Installed power (MW) | 2021 | 2020 | 2019 |
|-------------------------------------|----------------------|-------|---------------------|---------------|
| | | | Electricity product | ion (GWhe) |
| Hydroelectric plants | 604 | 1,239 | 1,295 | 1,331 |
| Photovoltaic plants | 20 | 21 | 21 | 21 |
| Thermoelectric plants | 855 | 2,337 | 2,706 | 2,471 |
| Cogeneration plants ¹ | 1,263 | 5,611 | 5,454 | 5,919 |
| Waste-to-energy plants ¹ | 95 | 578 | 598 | 601 |
| Landfills | 7 | 31 | 29 | 32 |
| Biogas plants | 1 | 5 | 7 | 4 |
| Other renewables | 1 | 1 | 0 | 1 |
| Total | 2,846 | 9,823 | 10,110 | 10,380 |
| | | ٢ | Thermal energy prod | uction (GWht) |
| Cogeneration plants | 874 | 2,564 | 2,230 | 2,381 |
| Boilers | 1,516 | 480 | 533 | 472 |
| Waste-to-energy plants | 191 | 285 | 180 | 142 |
| Biomass | 0.4 | 0.3 | 0.3 | 0.0 |
| Total | 2.581 | 3.329 | 2.943 | 2.995 |

¹ The capacity of the cogeneration plants and waste-to-energy plants refers to the electrical set-up; the capacity of these plants in cogeneration set-up is 1,092 MWe and 62 MWe, respectively.

Energy savings in processes

The efficient use and saving of energy resources are among the main objectives of the medium- and long-term Business Plan of Iren Group, pursued across all Business Units with increasing efficiency in processes and services, through solutions to guarantee stakeholders a reduction in energy consumption and the use of technological systems, monitoring and guidance of correct behaviour.

The total energy savings generated by the Group in 2021 stood at about 740,000 TOE (equal to about 31 million GJ), with contributions from various areas of operation.

| Energy savings in processes ¹ (TOE/000) | 2021 | 2020 | 2019 |
|--|------|------|------|
| Energy production plants | | | |
| Cogeneration plants ² | 233 | 213 | 225 |
| Hydroelectric plants ³ | 215 | 225 | 231 |
| Waste-to-energy plants ⁴ | 60 | 60 | 59 |
| Thermoelectric plants ² | 31 | 30 | 29 |
| Landfills ⁴ | 6 | 5 | б |
| Photovoltaic plants ³ | 4 | 4 | 4 |
| Boilers ² | 5 | 10 | 1 |
| Biogas plants⁵ | 2 | 3 | 2 |
| Sorted waste collection ⁶ | 97 | 92 | 93 |
| Material recovery ⁶ | 69 | 17 | 1 |
| Heat accumulators ⁷ | 9 | 5 | 7 |
| Other internal projects ⁸ | 9 | 8 | 5 |
| Total | 740 | 672 | 663 |

¹ Values are calculated in accordance with the criteria indicated in the notes to each table item. In some cases, the energy saved may increase/decrease in a manner that is not directly proportional to the increase/decrease in production, due to a change in the specific consumptions used for calculations;

² Comparison between gross production and actual fuel consumption of the Group with the consumption that the national electricity grid and the "national average" production system would have recorded to produce the same quantities of electricity and thermal energy;

³ The calculation was based on the assumption that there was zero fuel consumption and compared the consumption recorded by the national electricity grid for the production of the same quantities of electricity;

⁴ Sum of electric and thermal energy production converted to electric, according to specific factors (PAI=1/6.88, Piacenza=1/6, TRM=1/4.5), multiplied by the coefficient for electric energy (187 TOE/GWh);

⁵ Cubic metres of natural gas produced (60% of biogas) multiplied by the scm/TOE conversion factor 0.836;

⁶ Energy consumption avoided for the primary production of the main materials collected separately and recovered in the Group's plants;

⁷ Fuel not consumed in the production of the stored heat;

⁸ This includes savings obtained from activities of energy efficiency of production processes, from the district division of networks, from water houses, from projects to reduce the impacts related to the mobility of employees (IrenGo, Ecoviaggio, smart working and teleworking).

The goals of the Strategic Plan to 2030 include increasing energy savings from manufacturing processes to 1,740,000 TOE over the plan period. For this reason, Iren Group invests in internal projects and initiatives which, in 2021, concerned the waste-to-energy plants of Parma and Piacenza, with a saving of around 2,500 TOE, and the interventions planned as part of the ISO 50001 Certification for energy production plants, with a saving of around 2,300 TOE.



Energy efficiency certificates (EECS) and incentives

Thanks to the high efficiency cogeneration plant of Torino Nord, 107,817 Energy Efficiency Certificates (EECs) were obtained in 2021, equivalent to an equal amount of TOE of energy savings.

The requirement to produce (or purchase on the market) and supply Energy Efficiency Certificates to the GSE (Electricity Services Provider) is the sole responsibility of Ireti (as distributor) and is valid for 2021 (with maturity 31 May 2022).

Approximately 86 EECs were thus purchased at the average price of 256 Euro/EEC to fulfil the cancellation obligation provided annually for the distributor.

During the year, around 3,205,000 CO_2 allowances (EU Allowances) were purchased in order to comply the obligations provided for in the Emissions Trading System (ETS) legislation related to emissions generated by Iren Group's plants.

Green Certificates were replaced by equivalent incentives which, in 2021, the Group matured in the volumes below:

| Incentives by plant (no.) | 2021 |
|---|---------|
| Hydroelectric plants | 226,247 |
| Bardonetto | 14,725 |
| Valsoera, Telessio, Eugio, Ceresole, Rosone | 165,078 |
| Tanagro | 24,341 |
| Canate | 22,103 |
| Waste-to-energy plants (TRM) | 264,874 |
| Total | 491,121 |



Energy efficiency, renewable sources and district heating

[GRI 102-7, 302-5]

The Strategic Plan sets a target of 700,000 TOE of energy saved by 2030 for resilient cities, through the provision of products and services to communities and citizens that reduce environmental impacts. For 2021, the savings deriving from this business segment are equal to 206,000 TOE and can be attributed to the energy efficiency and rebuilding interventions carried out by Iren Smart Solutions, to the offer of low carbon products and services of the Iren Plus portfolio, as well as to the sale of green electricity.



Rebuilding and energy efficiency interventions

Iren Group contributes to the reduction of environmental impacts by customers, through energy efficiency and rebuilding interventions that in 2021 concerned:

- energy requalification of buildings with the start of numerous interventions of requalification and recovery of building facades, including several social housing buildings mainly in Genoa, Reggio Emilia and Savona;
- efficient city public lighting, thanks to the replacement of traditional lamps with LED fixtures that guarantee a reduction in energy consumption of more than 50%. The main project concerns the City of Turin, in addition to the activities carried out in the Municipalities of Alba, Asti, Biella, Fidenza, Vercelli and other small municipalities. In 2022,

management is expected to be extended to the cities of Cuneo and Tizzano Val Parma;

- upgrading of heating plants in municipal buildings, with the continuation of work (revamping 2 and 3) on the heating plants of numerous buildings in the City of Turin;
- installation of thermostatic valves and heat dividers in condominium contexts, which allow the reduction of consumption in individual apartments. Savings are calculated on the basis of the historical data of the apartment buildings, comparing the consumption before and after the intervention;
- heat management for private buildings with the replacement of diesel and traditional boilers with energy efficient condensing boilers. Savings are calculated by comparing the replaced boiler's rating plate data with that of the high efficiency boiler, and the Group took measurements before or after installation under the same conditions of use and weather conditions.

At the end of 2021, Iren Group acquired Bosch Energy and Building Solutions Italy, expanding the services provided in the energy efficiency sector, also as ESCo (Energy Service Company), in the design, construction and management of integrated heating systems, air conditioning and cogeneration for public and private customers.

Energy communities

In 2021 the line of activities for the development of energy communities and collective self-consumption systems was consolidated, in order to promote the diffusion of renewable source plants to condominiums, Public Administrations and small- and medium-sized businesses. Through energy communities, multiple users can share the electricity produced by one or more photovoltaic systems. The objective, therefore, is to encourage the installation of photovoltaic systems in contexts where the sharing of energy between several parties can generate economic and environmental benefits, while ensuring an important contribution to the competitiveness of companies involved and, more broadly, the development of distributed generation as an enabling tool for energy transition. The first pilot project was launched in Parma, adopting a management system that, based on the instantaneous consumption of condominium users, automatically manages the energy produced by the photovoltaic system, maximising energy self-consumption.

New development opportunities are emerging in this area, i.e. urban regeneration projects that allow for the return to the community of large brownfield sites redeveloped and designed to be low environmental impact or positive energy balance.

Green products and services

Iren Group offers a range of low carbon products and services (Iren Plus portfolio) that allow customers to obtain important results from the point of view of rationalising energy consumption:

- turnkey photovoltaic systems, from design to installation, for the production of clean and sustainable energy that can be stored thanks to the storage system and used only when needed. Energy savings are calculated estimating the kWh produced by the photovoltaic plants sold;
- latest generation heat pumps that allow to manage gas better and save up to 40% compared to current consumption;
- high-performance windows and doors to improve the energy efficiency of homes. The energy saved is calculated considering the difference in transmittance between the frames/windows replaced with the new ones;
- smart thermostats for energy efficiency that ensure the boiler is switched on for the minimum time necessary to maintain the desired temperature. Energy savings are calculated by estimating average gas consumption per household and applying a

25% reduction in consumption from the use of the thermostat;

• latest generation **condensing boilers** that allow saving up to 25% in consumption. Thanks to the recovery of part of the latent heat of the fumes and, consequently, to the lower use of fuel, the boilers produce, in addition to savings, less environmental pollution.

In addition to these products and services, the Group has consolidated its portfolio with the promotion of **green offers** both for the supply of **electricity** produced entirely from renewable sources, and through the first pilot projects aimed at offsetting CO_2 emissions related to the **supply of** natural **gas**. The solution envisaged for the latter is represented by certified carbon credits that attest to the offsetting or absorption of the CO_2 emitted into the atmosphere by the combustion of the gas. Carbon credits are generated from the development of environmental protection projects, accredited by major international standards.

Among the goals of the Strategic Plan is a steady increase in green electricity sales, to reach 3,500 GWh in 2030.



District heating

In the coming years, the plan to extend the district heating volume will offer customers the chance to contribute to the improvement of air quality in urban areas. The progress of this expansion is linked to the 2030 target set out in the Group's Business Plan.



In 2021, commercial development activities continued in Turin and adjacent areas, both in the new network extension areas and in the areas already served, while in the Emilia-Romagna area, activities continued to consolidate and increase the number of connected volumes and the marketing campaign in Piacenza.

| Project | Project objectives | Progress in 2021 |
|---------------------------------|---|---|
| Saturation of the Turin network | extension of the connections to bring the Turin area to a volume of 67 million m ³ and saturation of the district heating system's capacity, without the construction of new production sites | new volumes connected for approximately 0.9 million m ³ and laying of 8.3 km of network, reaching the progressive value of approximately 66 million m ³ |
| Torino Nord extension phase 1 | approximately 5 million m ³ of new district heating volumes to saturate the residual capacity of the system by optimising the storage systems | new volumes connected for 570,000 m ³ (progressive value reached of 1.9 million) and laying of 7.8 km of network |
| Torino San Salvario | extension of the district heated volumes (about 2.5 million m ³) and construction of a new storage system entirely concealed by a system of green surfaces and trees (<i>Giardino del Calore – "Heat</i> <i>Garden"</i>) | new volumes connected for approximately 620,000 m ³ (progressive value reached of 0.7 million) and laying of approximately 5.7 km of network |
| Turin waste-to-energy plant | connection of the Turin waste-to- energy plant with the district heating networks of Beinasco and Grugliasco to increase the volume served without the construction of new plants | connection of the network of Beinasco and Turin with connection to the storage system of Mirafiori Nord that will be completed in 2022, laying of 1.6 km of network in Grugliasco |
| Piacenza waste-to-energy plant | the district heating network's connection with the Piacenza waste-to-energy plant increases the volume of district heating by about 1 million m ³ | new volumes connected for about 125,000 m³ and laying of 230 meters of network |

Sustainable use of water resources

[GRI 102-7, 303-1, 303-2, 303-3, 303-4, 303-5]

Water withdrawals

The commitment to reducing environmental impacts is also reflected in the conscious and sustainable use of water resources in all the Group's processes and services, in terms of both withdrawals and consumption and releases and discharges.

The water supply to the Group's sites is made by withdrawing water from surface water bodies (reservoirs, rivers), from the sea and from groundwater pumped from wells and municipal water.

In 2021, the Group's water withdrawals decreased by approximately 7% compared to the previous year, despite increases from the change in scope, which were more than offset by lower energy production. There was an increase in seawater withdrawals, used solely at the Genoa Sampierdarena cogeneration plant, which more than doubled its energy production in 2021 compared to 2020.

Water withdrawal by source (m³/000)¹

| Sources | 2021 | 2020 | 2019 |
|-----------------|---------|---------|---------|
| Municipal water | 2,787 | 2,450 | 2,843 |
| Surface water | 493,418 | 535,074 | 557,655 |
| Seawater | 13,810 | 9,751 | 10,872 |
| Groundwater | 6,737 | 7,417 | 6,485 |
| Total | 516,752 | 554,692 | 577,855 |

¹ All withdrawal sources (except seawater) are composed of freshwater (≤1,000 mg/L of total dissolved solids). Water withdrawals for the production of hydroelectric energy are not included, as they are through water, withdrawn from surface water bodies (rivers, streams) and returned to them downstream of the plants, without changing their chemical and physical characteristics. For the integrated water service, withdrawals for industrial use in water treatment and purification activities are considered, and throughputs feeding local community waterworks are excluded.

Most Group companies have implemented a certified environmental management system (ISO 14001) and the main production sites have EMAS registrations; therefore, they have procedures for the management of water resources, which represent an operating tool for the management of withdrawals and discharges. The procedures apply to:

- the various types of production processes and/or supplies of services, which require the use of the water resource, even for a secondary purpose;
- water withdrawal of any type and purpose;
- treatments and qualitative modifications of the resource water made for any reason;
- water discharges of any nature, purpose and origin, discharging on soil, subsoil, in surface water bodies and sewers.

Iren Group pays particular attention to the implementation of initiatives to reduce water withdrawal for industrial and civil use in all of its activities.

In **energy production**, each activity regarding the use of water sources is regulated by legal provisions of the law or authorisations with the responsibility laying in the hands of the Legal Representative of the Company or Managers, provided with specific powers of attorney and proxies, who have the task of managing and supervising the correct performance of the activities and the correct application of the procedures. Moreover, the environmental analysis document, prepared for each site/plant, allows for the identification of the environmental aspects related to water resources and the obligations foreseen by environmental legislations. The analysis also identifies the applicability of the legislation to the Group's plants as well as the compliance with the regulations in force. The Torino Nord co-generation plant, for example, is equipped with recovery systems for rainwater and condensation produced by the turbine's air input refrigeration system. The industrial water produced is stored in a tank and used for firefighting purposes, to supply the demineralised water production installation and for plant-related services.

In **waste-to-energy** plants, priority is given to the recovery and recycling of water for combustion slag shut-down and plant cooling.

Water discharges

The activities carried out by the Group generate water discharges, whose management is regulated by the Integrated Environmental Authorisations, the Single Environmental Authorisations and existing legislation:

- industrial discharges (including water used for the cooling of plants);
- integrated water service (process water from wastewater treatment and potable systems that do not contain particular pollutants);
- waste management and treatment;
- washing vehicles and industrial areas;
- discharge of domestic water at non-industrial sites.

Most water discharges are composed of water used in the cooling process at thermoelectric plants, which is discharged to surface water (rivers).

Discharges, like withdrawals, are also 7% lower than in 2020.

Water discharges (m³/000)¹

| Destinations | 2021 | 2020 | 2019 |
|---------------|---------|---------|---------|
| Surface water | 494,744 | 536,634 | 558,470 |
| Groundwater | 231 | 151 | 188 |
| Seawater | 13,810 | 9,768 | 10,889 |
| Sewerage | 6,500 | 6,481 | 6,838 |
| Total | 515,285 | 553,034 | 576,385 |

¹ All discharges (except seawater) are composed of freshwater (<1,000 mg/L of total dissolved solids). For wastewater treatment plants, only process water is considered and not treated wastewater serving communities (see page 151).

The water withdrawn is almost totally returned to the environment: about 0.3% of withdrawals, equal to 1.5 million m³, is consumed in industrial processes. Predominantly water evaporated during production processes (WTE and thermoelectric plants) and used for the district heating networks.

Management of the integrated water service

Water production and distribution

The supply of water for the distribution of drinking water to the communities is carried out in compliance with regulations and concessions and according to effectiveness and efficiency criteria.

The criteria for using resources consider several factors: authorised quantities, size of reserves in the main reservoirs, the quality of available surface water, the hydrological features of the basins, final data relating to the previous year and the current year.

Modern automation and remote control equipment ensure the water catchment, purification, and lifting systems' best operation.

The total volume of water fed into the network in 2021 is in reduction compared to last year.

| Water injected into the network (m³/000) | 2021 | 2020 | 2019 |
|---|---------|---------|---------|
| Piacenza | 32,608 | 31,041 | 32,239 |
| Parma | 37,645 | 38,095 | 38,156 |
| Reggio Emilia | 44,936 | 45,818 | 46,159 |
| Vercelli | 8,614 | 8,916 | 8,744 |
| Genoa | 87,725 | 90,605 | 95,719 |
| Savona | 19,540 | 19,093 | 19,057 |
| Imperia | 3,108 | 3,080 | 3,462 |
| La Spezia | 39,800 | 38,002 | 40,296 |
| Other provinces | 3,941 | 4,956 | 6,638 |
| Total | 277,917 | 279,606 | 290,470 |

The commitment of Iren Group in the valorisation and protection of the water resource is expressed in the constant activity of research and reduction of network leaks and in the awareness of customers and citizens to the reduction of waste. In fact, in the 2030 Business Plan, the Group has planned significant investments to make the water distribution service increasingly efficient, with the aim of reducing water withdrawals from the environment and significantly reducing network leaks.

The percentage of network leaks stood at 32.6%, down compared to 2020 (33.3%) and significantly lower than the national average of 42% (ISTAT data).





Initiatives for the reduction water network leaks include the districts division: a technique that involves dividing the networks into small homogeneous areas, the so-called districts, which allow daily monitoring and constant analysis of hydraulic parameters. In this way, the instrumental leak detection campaigns are punctual and targeted only to the districts on which the monitoring has detected hidden leaks. Currently 60% of the total managed network is divided into districts, in line with the 2030 target of 90% of managed networks. The district division also produces a benefit in terms of reduction of energy consumption which, in 2021, amounted to around 140 TOE



Sewerage and treatment quality

Urban wastewater from public sewers is treated at 1,337 treatment plants of varying capacity and type. In the central plants, pre-treatments are carried out to remove coarse matter, sand and oils, primary treatments to remove settleable solids and traditional secondary and tertiary treatments for nitrogen removal and with chemical and biological dephosphating systems. The Group also manages several phyto-purification plants that use plants' treatment activity and are used both for the purification of sewage (sub-surface flow system) and for the refinement of water treated in traditional wastewater treatment plants (surface flow systems).



Treated wastewater (m³/000)¹

¹ For the volumes of water treated, all the Group's wastewater treatment plants with a capacity of more than 2,000 residents equivalent are considered. In Liguria, the Group does not manage the sewerage and treatment service in the Savona and Imperia areas.

Purified water quality is measured by the percentage of abatement of the main pollutants leaving the plants compared to the quantities entering: BOD (Biochemical Oxyge Demand), COD (Chemical Oxygen Demand), SST (Total Suspended Solids).

The group's goal is to have the following percentages of abatement in the purified water: cod greater than 90%, bod greater than 94%, and sst greater than 93%.

Overall, the following average results were obtained in 2021: 90.8% for COD, 94.4% for BOD, and 93.7% for SST. The chart details the reduction by geographic area.



Pollutant reduction – geographical area (%)¹

¹ For the calculation of pollutant reduction, all the Group's treatment plants with a capacity of more than 2,000 residents equivalent are considered. In Liguria, the Group does not manage the sewerage and wastewater treatment service in the Savona and Imperia areas.

The Group's long-term objectives also include increasing the capacity of its sewerage treatment plants in order to provide increasingly extensive and efficient service and to improve the environmental impact of wastewater management.

In 2021, the Group experienced a slight reduction overall compared to 2020 due to the divestiture of certain small facilities, collating sewer networks to existing facilities with remaining available capacity, partially offset by new acquisitions and capacity increases on existing plants. Progress toward the goal set in the Business Plan will be made up from 2022, when a capacity increase of approximately 27,000 population equivalents is expected.



Water reuse

Wastewater treated in Iren Group plants can be reused for irrigation purposes (in agriculture, green spaces and sports facilities) and industrial purposes (plant cooling, street cleaning). Water reuse can reduce significant pressure on natural water resources and fight water scarcity, promoting the transition to production models centered on the concept of circular economy.

The Group, which currently recovers around 6 million cubic metres of water thanks to the Mancasale wastewater treatment plant, has set itself the goal of reaching 20 million cubic metres of recovered resources by 2030.



Receiving bodies of treated wastewater

All the water bodies that receive wastewater treated by the Group in the Emilia and Piedmont regions fall within the Po River basin. The land lies within an area declared as sensitive so the plants, depending on their size, are subject to the application of the strictest nitrogen and phosphorus limits.

The wastewater treated by plants in Liguria's served areas is discharged into the Ligurian sea (mainly the Gulf of Genoa, the Gulf of Tigullio and the Gulf of La Spezia).

Adoption of Water Safety Plans

The Water Safety Plan (WSP) is a model, introduced by the World Health Organisation, that is based on the assessment and management of risks related to the phases of the integrated water service, from the capture to the final use of water, with the aim of protecting the water resource and reducing potential health hazards.

In 2019, Iren Group started the implementation of the first four WSPs, proceeding to identify the supply areas with the highest number of inhabitants for each of the areas served. The first WSP launched was that of Brugneto (Genoa), serving 170,000 inhabitants, followed by three others in the main provinces of Emilia (Parma, Piacenza, Reggio Emilia).

Provincial multidisciplinary teams have been created, involving both internal Group structures and external control bodies (AUSL, ARPA, Regions, ATOs and Municipalities), which have started the process of assessing the risks of the area under examination and the existing control measures, hypothesising possible improvement actions and identifying operational monitoring tools.

In the water risk assessment, related to the first WSPs launched, a particular focus has been on climate risks intended both as exceptional weather phenomena (floods, severe droughts) and as changes in the quality/quantity of water resources due to climate change.

The first WSPs, completed in December 2021, will be followed by the launch of the remaining plans according to a defined chronological schedule aimed at prioritising the areas serving the largest populations, while also considering the largest number of sensitive users served (hospitals, nursing homes, schools).

Circular waste management

[GRI 102-7, 306-1, 306-2, 306-3, 306-4, 306-5]

Waste produced by the Group

Attention to the environment is also reflected in the correct management of the waste produced in carrying out the Group's activities, in accordance with the **principle of the waste hierarchy**, which aims to prevent the production and use the waste produced first of all as a material, through reuse and recycling, then as energy and, only in the residual phase, through disposal (art. 179 of Italian Legislative Decree no. 152/2006).

The management of special, hazardous and non-hazardous waste produced at the main production sites is carried out in compliance with the procedures laid down in ISO 14001 standard or EMAS registrations, for sites with such certifications, and in accordance with environmental regulations (Part IV of Italian Legislative Decree 152/2006). The transport and recovery/disposal of waste produced by company processes is carried out, where possible, internally by the Waste Management business unit and, where it is necessary to use third parties, it is always entrusted to bodies registered with the Register of Environmental Managers. The quantities of waste produced are monitored periodically and communicated annually to the Chambers of Commerce through the Environmental Declaration Form.

The Group's main waste-generating activities are:

- the **treatment and processing of** urban and special **waste** that the Group manages for communities and private bodies (e.g., leachate generated at landfills, ash and slag from waste-to-energy plants, etc.);
- the **wastewater treatment and purification of water** in the management of the integrated water service for the municipalities served by the Group (e.g., sludge, sand);
- operation and maintenance of heat and energy production plants and electricity and gas distribution networks.

Systems of sorted waste collection, aiming to increase material recycling, have been installed in all Group sites. Policies limiting the use of paper have also been drawn up and implemented through dematerialisation and computerisation of processes.

Waste produced by Group processes (t)



In 2021, the Group produced 690,620 tons of waste, of which 641,288 tons was non-hazardous. The increase over the previous year (approximately 14%) is mainly due to the consolidation of the former Unieco Environment Division companies acquired at the end of 2020. The waste from these companies accounts for approximately 18% of the total waste generated by the Group in 2021.

In addition to complying with the legislative framework, the waste cycle is closed with a particular focus on the valorisation of the waste resource (recycling, material recovery and preparation for re-use) with priority to the energy recovery of waste that cannot be usefully recovered, and only as a last resort to disposal.

| Waste generated by business and main materials $(t)^1$ | 2021 | 2020 |
|--|---------|---------|
| Waste management services | 532,610 | 437,406 |
| of which non-hazardous | 483,653 | 353,433 |
| slags | 169,701 | 173,558 |
| leachate | 84,756 | 71,536 |
| sludge | 15,647 | 7,534 |
| sands | 4,826 | 4,548 |
| metals | 8,898 | 8,238 |
| other waste | 199,825 | 88,019 |
| of which hazardous | 48,957 | 83,973 |
| Integrated water service | 156,508 | 167,185 |
| of which non-hazardous | 156,315 | 167,072 |
| sludge | 131,752 | 143,727 |
| sands | 7,679 | 5,762 |
| sieve/muddle | 5,394 | 5,637 |
| other waste | 11,490 | 11,946 |
| of which hazardous | 193 | 113 |
| Energy production | 1,027 | 892 |
| of which hazardous | 163 | 188 |
| Other non-hazardous waste | 456 | 187 |
| Other hazardous waste | 19 | 34 |
| Total | 690,620 | 605,704 |

¹ The difference between waste generated and its destination (tables below) is mainly due to the amount of liquid waste used as fluidisers in the solid waste inerting process. Data is only available for the two-year period because the breakdown of waste generated required by the new GRI 306 standard has been adopted since 2020. It should be noted that the Group's activities do not produce any radioactive waste.

Waste diverted from disposal

In 2021, approximately 60% of the waste produced by the Group was diverted from disposal and sent to the material recovery chain through recycling, preparation for reuse or other recovery operations, in plants owned by the Group or by third parties.



The details of the waste diverted from disposal are shown in the following table.

| Wests diverted from dispacel (*) | 2021 | | 2020 | |
|----------------------------------|--------------|--------------------|--------------|--------------------|
| waste diverted nom disposal (t) | Group plants | Third-party plants | Group plants | Third-party plants |
| Preparation for reuse | 41,221 | 180,446 | 46,311 | 128,108 |
| of which hazardous | 29 | 8,855 | 48 | 23,708 |
| Recycling | 4,085 | 172,995 | 192 | 168,792 |
| of which hazardous | - | 11,148 | - | 24,543 |
| Other recovery operations | 2,515 | 14,425 | 47 | 13,123 |
| of which hazardous | 35 | 1,143 | 13 | 275 |
| Total | 47,821 | 367,866 | 46,550 | 310,023 |

¹ From 2020, the breakdown of waste generated required by the new GRI 306 standard has been adopted; therefore, a comparison with the three years is not possible.

Waste directed to disposal

The remainder of the waste produced by the Group (around 40% of the total) was sent for incineration with energy recovery (17%), landfill (13%) and other disposal operations (70%), in plants owned by the Group and by third parties, in the quantities shown in the table below.



| Wests directed to dispessel (t)] | 2021 | | 2020 | |
|--|--------------|--------------------|--------------|--------------------|
| waste directed to disposal (i) | Group plants | Third-party plants | Group plants | Third-party plants |
| Incineration with energy recovery | 46,254 | 195 | 36,301 | 828 |
| of which hazardous | 64 | - | 4 | - |
| Landfilling | 14,784 | 20,814 | 7,725 | 4,864 |
| of which hazardous | 7,267 | 105 | - | - |
| Other disposal operations ² | 120,319 | 70,788 | 124,832 | 74,692 |
| of which hazardous | 15,440 | 5,711 | 8,616 | 27,112 |
| Total | 181,357 | 91,797 | 168,858 | 80,384 |

¹ From 2020, the breakdown of waste generated required by the new GRI 306 standard has been adopted; therefore, a comparison with the three years is not possible.

² Includes 19 tons of waste sent to incineration without energy recovery at third-party facilities.

Waste management services for communities

Waste collection

Iren Group operates in the waste collection sector in a number of different capacities, depending on the agreements in place with service providers:

- as operator, based on long-term service contracts, in 171 Municipalities in the provinces of Parma, Piacenza, Reggio Emilia (Iren Ambiente), La Spezia (Acam Ambiente), Vercelli (ASM Vercelli) and in the City of Turin (Amiat). In these contexts, the Group collaborates with the Regulatory Bodies to define targets and plan the collection systems;
- as a contractor, in the case of San Germano, with operational support to Public Administrations or other operators, in 129 other municipalities.

In 2021, the Group provided urban waste collection services in a catchment area of about 3 million residents, where the Group handled about 2.7 million tons of urban waste (approximately 358,000 tons collected by San Germano). Also for 2021, in order to deal with the Covid-19 emergency, the Group organised the collection service by adopting specific methods, in line with the provisions of the Local Authorities: in Liguria, the dedicated collection of waste produced by families with cases of contagion or quarantine continued; in Piedmont and Emilia-Romagna, on the other hand, in the presence of cases of contagion or quarantine, the suspension of the sorting of waste was ordered, so as to send it for disposal through waste-to-energy, considered the most suitable way to guarantee health and safety. In addition, in the Emilia-Romagna region, the floor collection service continued in case of need.



Preventing waste generation, increasing sorted waste collection levels, and recycling waste are key objectives of management policies, as they reduce disposal requirements and thus the overall environmental impact. In addition to specific communication and information campaigns aimed at raising awareness among citizens to reduce waste production, Iren Group adopts advanced collection systems (door-to-door, ecological islands with user recognition, "pay-as-you-throw" system), which contribute to achieving **excellent levels of sorted waste collection**: in 2021, the Group reached 70.3% (69.3% in 2020), compared to a national average of 63%.

In the system offered to residents to increase the results of sorted waste collection, the presence of 317 waste collection centres (151 in the San Germano operation area) is particularly relevant, enabling residents to freely deposit different types of waste in large containers. The range of services is completed by collecting bulky waste at home and services dedicated to companies for the management of waste assimilated to urban waste.

Of the 1,370,384 tons of urban waste collected in the areas where the Group acts as operator, 960,162 tons referred to sorted waste. Positive results were also obtained in the municipalities served by San Germano with 244,969 tons of sorted urban waste collected (up 13% compared to 2020).



Sorted waste collection by region (%)

In 2021, the percentage of sorted waste collection has once again improved, reaching 81% in the areas of Parma and Reggio Emilia and also improving significantly in the City of Turin (52.9% compared to 50.7% in 2020).

In line with sector directives and local planning, in the 2030 Business Plan, the Group has confirmed its commitment to achieving further growth in sorted waste collection in order to reach 76.2% in the basin served by 2030, through the ongoing development of local and home collection services and "pay-as-youthrow" systems.



At the end of 2021, residents of legacy regions served by punctual metering systems are 26% of the total, up from 18% in 2020 and in line with the goal of 64% in the 2030 Business Plan.



Sorted waste collection by method (t)

For the development and increasingly efficient management of collection, we highlight the importance of the project of computerisation of processes (JustIren) launched in 2020 in Turin and gradually extended in 2021 in the other territories (Emilia, La Spezia and Vercelli). Once fully operational, JustIren will allow to obtain important environmental benefits, thanks to the optimisation of the collection services, of the logistics of waste delivery, of the monitoring of the services on the territory and of the extension of "pay-as-you-throw" system.

Sorted waste, up 4% compared to 2020, is sent to recovery through specialised platforms and sector supply chains, thanks to the agreements in place with the Consortia belonging to Conai (National Packaging Consortium), or through private operators.

Sorted waste recovered by type (%)



Waste recovery, treatment and disposal

In order to guarantee an effective management of the entire waste cycle, the Group is also committed to the treatment and disposal, the recovery of material and the valorisation of the resource waste for the generation of electricity, heat and biogas through a structured system of plants. In 2021, the Group's plant base expanded, thanks to both the construction of new plants and newly acquired companies. In the fall of 2021, the new plastics recovery and Bluair® production plant in San Giorgio di Nogaro went into operation and, during the same period, work was awarded on the new wood recovery plant in Vercelli. As far as new acquisitions are concerned, the Group has added a plant for the recovery of sorted waste collection (A.M.A.) and a composting plant (Futura), as well as various other storage and transfer, liquid treatment, mechanical-biological treatment (TMB) plants.

The plants owned by Iren Group at 31/12/2021 are as follows:

| Plants | Number |
|--------------------------------------|--------|
| Waste-to-energy plants | 3 |
| Operating landfills | 4 |
| Storage and transfer | 22 |
| Liquid waste treatment | б |
| Material recovery | 15 |
| Organic waste treatment and recovery | 4 |
| Mechanical-biological treatment | 5 |

As already highlighted above, in the Business Plan to 2030, the Group has demonstrated a significant commitment to closing the circular economy cycle, by foreseeing huge investments in numerous new plants for the recovery of the organic fraction, with the production of compost and biomethane, for the recovery of paper, plastic and wood, with the production of materials that are reintroduced on the market: the goal is to reach 2.3 million tons of material recovery capacity from waste in owned plants.



Biomethane production

The Cairo Montenotte and Santhià plants are two plants for the recovery of organic waste, which from 2021 will produce, in addition to quality compost, biomethane, a natural gas derived from the refining and purification of biogas produced during the anaerobic digestion of organic waste and the green fraction. This is the virtuous product of sustainable waste management, in this case deriving from the transformation of the organic fraction, which today constitutes about 40% of the total waste produced.

The process, defined as upgrading, allows to increase the percentage of methane contained in the biogas, up to about 99% within the mixture. In this way, the energy characteristics and uses of biomethane correspond to all effects to those of natural methane, with two substantial differences: it is not extracted from the bowels of the earth, eliminating the dangers of extraction and transport, and it is obtained from renewable raw materials that can be found near the production plant.

Biomethane is to all intents and purposes a renewable source of energy, an example of circular economy and an indispensable support for decarbonization, for example of the mobility sector, which contributes to reducing the use of fossil fuels, the main source of GHG emissions.

In its Business Plan, Iren Group has set, among the objectives linked to the circular economy, the production of around 57 million m3 of biomethane by 2030.



In 2021, a total of 3.6 million tons of waste was managed, including 385,744 tons collected by San Germano (these quantities are not included in the breakdowns below).



Waste managed by type (t)

The **sorted component** of the waste is growing compared to 2020, thanks both to the increase in sorted waste collection in the legacy regions and to the new material recovery and composting plants. This fraction of the waste can be sent directly for recovery or transit through Group plants or storage areas, where it is sorted and/ or treated before its final destination.

The **unsorted component** of the waste is destined for various disposal methods searching for the best use of the waste resource that sees energy recovery, through waste-to-energy, as the most effective solution from an environmental point of view. The significant increase recorded in 2021 in the quantities of special and unsorted waste managed is due to the entry into the Group's boundary of the companies of the former Unieco Environment Division which, as described above, carry out brokerage activities and manage various waste treatment plants, landfills and mechanical-biological treatment (TMB) plants. The latter type of plant allows for the

mechanical selection of unsorted waste, intercepting the organic fraction present in it which, once biologically stabilised, can be sent for recovery. In 2021, approximately 275,000 tons of waste was processed at the Group's owned TMBs.

Destination of managed waste (%)



43% of the waste managed in 2021 was destined for the material recovery chain in Group and third-party plants. Waste sent to landfill represents approximately 12% of the total, up from 5% in 2020 due to the change in boundary.



¹ The Group does not handle radioactive waste. Specific management and control procedures are in place at the plants, which require that any waste with a radioactive load intercepted prior to entering the plants (e.g. household/medical waste) is inspected by qualified experts, stored in special quarantine areas and sent for disposal only when the radioactive load has decayed.

47% of the portion of waste that could not be recovered as a material was sent to energy recovery and the remaining part to other disposal operations or to landfills

Also in 2021, no waste was sent for incineration without energy recovery. Compared to the total waste managed by the Group in 2021, only 3% is of hazardous type¹ (about 14,300 tons sent to material recovery and about 89,000 tons to disposal).

¹ The Group does not handle radioactive waste. Specific management and control procedures are in place at the plants, which require that any waste with a radioactive load intercepted prior to entering the plants (e.g. household/medical waste) is inspected by qualified experts, stored in special quarantine areas and sent for disposal only when the radioactive load has decayed."

Mobility management

[GRI 302-1, 302-2, 305-1, 305-5, 305-7]

The Group is committed to reducing atmospheric emissions from road traffic through the progressive electrification of its fleet, the systematic renewal of vehicles and the promotion of initiatives for employees.



Owned and leased vehicles as at 31/12/2021 (no.)

Atmospheric emissions of company vehicles (t)

| Types of emissions (t) ¹ | 2021 | 2020 | 2019 |
|-------------------------------------|--------|--------|--------|
| NO _x | 53 | 55 | 92 |
| VOC | 2 | 3 | 5 |
| СО | 20 | 25 | 33 |
| PM10 | 4 | 4 | 5 |
| CO ₂ ² | 19,978 | 18,555 | 20,517 |

¹ The emissions are calculated multiplying the km travelled by the vehicles (broken down into different Euro categories, type of fuel and vehicle) by the more recent emission coefficients (Source: INEMAR - ARPA Lombardia 2018). The mileage is obtained from the Group's management software and through data from fuel companies on which merit checks are carried out.

² The data for 2020 has been restated.

The management of the vehicles is carried out in compliance with the company guidelines that define safety levels, maximum distances and replacement criteria in relation to the overall distances, the age and wear of the vehicle and the variation in operational needs. Obsolete vehicles are replaced with electric or Euro 6 category vehicles.

The Business Plan confirms the drive towards sustainable mobility and the desire to make 100% of the company fleet eco-friendly by 2030. The goal can be achieved mainly thanks to the **IrenGo** project, which involves purchasing full-electric vehicles – cars, vans, vehicles for sorted waste collection and heavy vehicles – and the installation of recharging infrastructures (recharging units and wall boxes) at the Company's premises. At the end of 2021, about 830 electric vehicles were already on the road (cars, vans and waste collection quadricycles) and there were about 880 operational recharging points. These are vehicles that contribute to the improvement of air quality in the urban contexts in which they operate on a daily basis. In 2021, the IrenGo project made it possible to avoid the emission of approximately 1,400 tons of CO_{2eq} and to save over 300 TOE.

The Group also promotes initiatives to encourage employees to use public transport (purchase of season tickets at a discounted price, in instalments or charged to their salary) and alternative methods of transport to reach the workplace, such as the "Ecoviaggio Smart" app, which offers the possibility of organising car-sharing journeys for work.



Progress towards the 2030 target was influenced by an increase in the number of vehicles in the Group's fleet, due to the entry of new companies acquired during the year, and the replacement of obsolete ecological vehicles, dedicated to sorted waste collection, with new electric vehicles.



Working from home in 2021 had a positive environmental impact: about 1,800 t CO_{2eq} avoided and 820 TOE saved

In addition, the Group has been implementing remote working methods (teleworking and smart working) for several years now, involving over 3,500 employees in 2021. This has generated a positive environmental impact: thanks to the reduction in travel, estimated at almost 12 million km, approximately 1,800 tons of CO_{2eq} have been avoided and approximately 820 TOE saved.



Protection of biodiversity

[GRI 304-1, 304-2, 304-3, 304-4, G4-EU13]

Protecting biodiversity from the continuous deterioration of natural habitats and threats to certain species is one of the main issues considered by the European Union in its environmental policy, oriented to the conservation of natural and semi-natural habitats and of wild flora and fauna within the territory of member states. To this end, a network of special protected areas was established at European level under the Directive "Natura 2000", involving various Italian regions and areas. In addition to almost uncontaminated natural habitat, the network also includes certain environments transformed by man over time which represent important areas for the survival of numerous species of plants and animals. The protection of Natura 2000 sites is mandatory (Italian Presidential Decree 357/1997 "Regulation implementing Directive 92/43/EEC on the conservation of natural habitats, and of wild flora and fauna" and Italian Presidential Decree 120/2003).

The regulation establishes that the territorial planning and programming must take into account the naturalistic-environmental value of Sites of Community Importance (SCI) and Special Protection Areas (SPA). In addition, it establishes that any plan or project, inside or outside these areas, which may in some way affect the conservation of protected habitats or species, must be subject to an appropriate assessment of the impact it may have on the sites concerned. Prior to the implementation of new measures, the development of new networks and the execution of significant maintenance activities (revamping/repowering), which may lead to environmental impacts for the "Natura 2000" protected areas, they must be submitted for prior assessment in order to protect the integrity of the area. It is also necessary to verify that machinery, plants and equipment subject to the measures possess the environmental requirements necessary and to assess the potential impacts resulting from the use of hazardous substances and the adoption of appropriate management measures. In particular, the impact assessment (art. 5 Italian Presidential Decree 357/1997) is the procedure implemented in cases where an intervention may significantly affect an SCI or an SPA in the "Natura 2000" network. The Ministry of the Environment and the Protection of the Land

and Sea publishes decrees which list the Italian SCIs.

The realisation and management of plants, activities and projects must be carried out in accordance with Italian environmental regulations (Italian Legislative Decree 152/2006) which provide for the **integration of environmental aspects in the development of plans and programs** and the **Environmental Impact Assessment** (EIA), with the aim of identifying and assessing in advance the effects on the environment of certain public or private projects – in their start-up phase or in case of significant changes to existing projects – and of identifying the measures to prevent, eliminate or minimise negative impacts on the environment before they actually occur, analysing the impact in terms of atmospheric emissions, water withdrawals and discharges, waste, noise and odours.

Group policy and principles

Iren Group formalised, in its Biodiversity Policy, its commitment to the conservation of biodiversity, which is based on the adoption of an effective management model, consistent with the National Strategy for Biodiversity, with European Union strategic objectives (European Green Deal and EU Biodiversity Strategy to 2030) and with the United Nations Sustainable Development Goals (SDGs). The principles on which the Group's Policy is based are:

- conservation of the biodiversity of ecosystems, in particular for the activities carried out in vulnerable or protected natural areas;
- monitoring and mitigation of the impacts of the activities on biodiversity;
- promotion of environmental improvement through actions aimed at protecting areas of high ecological value and disseminating a culture of biodiversity;

- raising **awareness** and **knowledge** about biodiversity, its protection and conservation, encouraging best practice and passing it on internally and externally;
- **collaboration** with local associations and communities in actions and projects designed to increase stakeholders' awareness of the importance of protecting biodiversity.

Activities in protected areas or areas of environmental interest

The Group's activities, by their very nature, have a direct or indirect impact on the air, water resources, soil, ecosystems and the species that inhabit them. For this reason, Iren, aware that the preservation of the natural ecosystem is essential for long-term global sustainability, promotes the sustainable development of its activities.

The electricity generation activities in protected areas mainly concern hydroelectric plants, their impact on water resources and in terms of acoustic emissions. Water withdrawals and releases are managed in accordance with the concessions issued by the Competent Authorities and the legislation in force. Management Plans have been prepared for all the reservoirs managed (pursuant to Italian Legislative Decree 152/2006) with the relevant impact studies for those affecting SCI areas. The sources involved in water withdrawals at hydroelectric plants are the Ligurian Sea, the Po River, the Naviglio Grande canal, the Orco, Dora Riparia, Maira, Brugneto, Secchia, Bussento, Tanagro, Tusciano, Calore, Picentino, Terza rivers and the aquifer, through wells, for industrial use. Water discharges flow into the Ligurian sea, the basin of the Po, Ticino, Dora Riparia and Secchia rivers, lake Pian Telessio in Piedmont, the Chisola and Piantonetto streams, and the Naviglio Grande canal in Lombardy. All discharges, authorised and in compliance with the law, are made up of cooling water from the plants or water from the treatment processes of the water used in production sites. The measures to improve efficiency of hydroelectric plants, carried out by the Group, have positive repercussions on the entire system, as they reduce the need to produce energy from fossil sources and help to reduce atmospheric emissions. For all the redevelopment work carried out, the plant IAFR certification (certifying that it is powered by renewable sources) was obtained, which identifies the environmental

benefits expected in terms of reductions in SO_2 , CO_2 , NO_x , particulate and natural gas emissions. In order to minimise the acoustic impact on the surrounding environment, all systems are properly soundproofed.

The development of the **electricity distribution network** may directly involve or be in the immediate vicinity of various areas of the "Nature 2000" network, including: Collina di Superga (SCI), Meisino (SPA), Stupinigi (SCI), in the City of Turin, Lama del Badiotto (SPA) and Garzaia della Brarola (SPA), in the City of Vercelli. The electricity distribution network of Parma does not affect SCIs or SPAs in the "Natura 2000" network.

Waste management and environmental hygiene activities do not affect protected areas. Plants with greater capacity (waste-to-energy plants and landfills) are equipped with a green system, in harmony with the vegetation climax in which they are situated, with visual and environmental mitigation functions. The impacts related to the activities carried out are examined annually with the aim of verifying the result of the interventions carried out and of having all the elements necessary to confirm or modify the system implemented, in order to assess compliance with environmental regulations and authorisations and to define/update management systems improvement plans, including those related to environmental performance. The Parma Integrated Environmental Centre (PAI) operates in a largely industrial area and has a green system that, in addition to complying with the mitigation of particulates, also restores some habitats and acts as an ecological bridge between different biotopes and will lead to the creation of an ecosystem that could be an important resource for the overall recovery of the landscape and ecological value of the area. Every year, a monitoring campaign is carried out on the content of the particulates collected from the plants sowed, in order to estimate the environmental benefits in terms of the atmospheric particulate matter removed. The Piacenza waste-to-energy plant is located in an area that is not subject to any urban, landscape, hydrogeological, seismic or territorial constraint and in which there are no protections for parks, oases or other protected areas. The Turin waste-to-energy plant (TRM) obtained a positive environmental compatibility assessment via a process that included an Environmental Impact Study (EIA), the conclusions of which, in terms of vegetation, flora, fauna and ecosystems, demonstrated that the site is located within a highly developed area where no specific natural value has been detected regarding vegetation and wildlife. Despite being in the middle of an EIA phase, the introduction of the plant does not indicate the appearance of significant symptoms of stress on the ecosystems that already suffer from human impact; the emissions do not cause any harm to the local fauna present across a vast area, including the areas of particular naturalistic interest represented by the Stupinigi Natural Park and the system of protected areas of the Po River belt.

The management of the **gas distribution** service does not have any significant impact on biodiversity. Infrastructure development, maintenance and management activities rigorously comply with the regulatory framework relevant to environmental impact. Annual walking inspections are carried out within the natural areas where plants are present and at the end of the winter season to not damage the vegetation.

Regarding the **integrated water service**, all the water bodies receiving wastewater treated by the Group in the Emilia and Piedmont regions are located in the basin of the Po River, which falls within the area declared sensitive. Plants, therefore, are subject, depending on size, to the application of more restrictive limits for nitrogen and phosphorus. The wastewater treated by the treatment plants situated in the Liguria area is drained into the Ligurian sea from the coast (mainly the Gulf of Genoa, the Gulf of Tigullio and the Gulf of La Spezia). By nature, the activities conducted are aimed at maintaining optimal environmental conditions. The main objective of the wastewater treatment activity is to ensure that discharges are appropriately treated so that they are compatible with the natural habitats of the receiving bodies of water. In the same way, protecting the areas in which sources of water withdrawal are found is of the utmost importance for the management of the integrated water service. Screenings and environmental impact assessments are carried out within the timeframe required by regulations, both for water treatment plants and water withdrawals. The Genoese plants of the Brugneto Dam lie within Antola Regional Park (Genoa), while the Gorzente lakes lie within the Regional Park of Capanne di Marcarolo, partly within the Province of Alessandria. In the Province of Piacenza, the Group owns a lowland forest within the protected area of Conoide del Nure and Bosco di Fornace Vecchia (SCI). The wastewater treatment plants managed in the province of La Spezia are located near the Cinque Terre National Park/Cinque Terre Marine Protected Area, the Porto Venere Regional Nature Park, the Regional Nature Park of Montemarcello-Magra-Vara and the Regional Islands of Portovenere Marine Protection area.

No natural habitats were offset during the reporting period.

Main areas and species protected

Iren Group constantly collaborates with the Local Sector Authorieties of the protected areas in which it works to safeguard the ecosystem and protected species.

It also undertakes to increasingly extend the mapping and location of plants and networks to identify their potential interferences with the protected areas they are located or in their vicinity.

The map shows the main Sites of Community Importance and Special Protection Areas where plants and/or networks managed by Iren Group are located. In 2021, the protected areas located in the operating territories of the newly acquired companies were also taken into consideration: the Gran Sasso e Monti della Laga National Park, the Maremma Regional Park and the Vauda Nature Reserve. There are approximately 351 protected species present in the Group's protected areas of operation and listed on the IUCN Red Lists. Approximately 32% of these are among the following categories: regional extinction (RE), vulnerable (VU), endangered (EN), critical risk (CR) and nearly threatened (NT).

Bees in our plants for the ecosystem

In 2021, two beehives were placed in the area outside the Torino Nord cogeneration plant with the aim of monitoring, on an experimental basis, the quality of the area and of various environmental matrices and to facilitate pollination activity.

More than 120,000 bees have been placed in the hives, which are able to pollinate about 60 million flowers every day in the area surrounding the plant and to have a production of about 20 kg of honey per year. The project also provides, through constant observation of the behaviour of bees, their health and their honey production capacity, the verification of the behaviour of the community and the recording of any behavioural changes in the ecosystem created.

The increasingly massive use of insecticides, herbicides and pesticides and the erosion of biological diversity caused by industrial agriculture in recent years, are putting a strain on the survival of bees and all pollinators that are the basis of the delicate balance of the Earth's ecosystem, which is reflected in biodiversity.

(1)Val Clarea

Gran Paradiso National Park 2 Mont Avic Natural Park

2 1

Stupinigi Natural Park 3 Meisino Park Collina di Superga Avignana Lakes Natural Park

4 Xerothermal Oasis of Oulx - Auberge Rocche del Roero Stura and Maira Upper Valleys 5

Lanca Santa Marta 6) Special Reserve

Valle Orco 7

Ticino Valley Natural Park Lama del Badiotto and Garzaia della 8 Brarola

9) Garzaia di Carisio Natural Park

Palude di San Genuario Regional (10) Reserve

Vauda Oriented Natural Reserve Po River Park (11)

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- 12 Conoide del Nure **Tuscan-Emilian Apennines** 13 National Park
- 14 Taro River Park



Mincio Park Oglio Sud Park Parma Morta Oriented Natural Reserve

Capanne di Marcarolo Regional Park Regional Natural Park of Beigua (16)



Aveto Val Noci Regional Park Antola Regional Park



Portofino Natural Marine Protected Area

- Portovenere Regional Natural Park and Regional Marine Protection Area 19 "Isole di Portovenere" Montemarcello-Magra-Vara Regional Natural Park 5 Terre National Park and Marine Protected Area 20
 - Le Balze Natural Area
- 21 Maremma Regional Park
- Gran Sasso and Monti della Laga National Park 22
- 23 Monti Picentini Regional Park
- Cilento and Vallo Di Diano National 24 Park
- 25 Monte La Noce Natural Park

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- Monte Linas, Marganai-Oridda, Montimannu Natural Park
- (27) Gutturu Mannu Regional Natural Park

Other initiatives to mitigate environmental impacts

[GRI 301-1, 307-1]

The Group implements many initiatives in order to reduce the environmental impact of its activities in the various business sectors.

Waste management services

All of the **waste-to-energy** plants are equipped with monitoring systems that guarantee continuous measurement of emissions and verification of compliance with the regulations and the Integrated Environmental Authorisations with control of the substances indicated. In order to optimise mercury abatement, a flue gas filtration system was installed at the Turin waste-to-energy plant in 2021.

For the containment of the biogas emissions from **landfills**, cycles of internal control are carried out for the regulation of the valves at the top of the biogas collector wells with measurement of the capturing efficiency of the plant.

Another initiative regarded the **replacement of** diesel-powered **roll on/roll off compactors** with electronic equivalents. In 2021, 11 new equipment were purchased, which make it possible to reduce emissions into the atmosphere and, at the same time, noise emissions.

Integrated water service

The initiatives aimed at reducing the environmental impacts mainly concern:

- the reduction of energy consumption by adapting wastewater treatment processes and replacing old machinery with the latest generation equipment that consumes less energy;
- the replacement of submersed **electric pumps** of the pumping stations with new pumps fitted with inverters;

- the reduction of **water procurement** through the reduction of water mains leaks;
- the improvement of the quality of the water that leaves the treatment plants and the connection of stretches of untreated sewage to final treatment systems;
- the abatement and containment of **odorous emissions** from treatment plants by confining them to secure rooms during the process in order to allow the air to be aspirated and treated.

The network of water houses for the free supply to citizens of water resources (chilled and sparkling), coming from the managed aqueducts, allows to strongly reduce the use of plastic bottles (about 19 million 1.5 litre bottles in 2021) and, consequently, the production of waste (674 tons of PET avoided), with an estimated saving of 1,754 tons of CO_{2eq} thanks to the avoided consumption of 1,280 tons of oil equivalent for the production of bottles.



The water houses have avoided the production of 674 tons of plastic waste and 1,754 tons of CO_{2eq}

PCB management

Polychlorinated biphenyls (PCBs) are aromatic compounds – consisting of toxic chlorinated molecules that are persistent organic pollutants with bio-accumulative properties – found in transformers and other electrical equipment. To avoid forms of pollution or dispersion of these substances, Iren Group regularly and continuously updates the number of machines containing insulating oil and the quantity contained in them, in accordance with registration and cataloguing procedures. The environmental performance improvement programme of electricity distribution provides for the gradual decommissioning of electrical devices containing PCB/PCT contaminated oil. The goal is to keep the disposal trend steady until the elimination of all of the contaminated devices. In 2021, 15 electrical and electronic equipment containing oil contaminated with PCBs at concentrations between 50 and 500 ppm were sent for disposal, in the quantities indicated in the table.

| Oil containing PCB disposed of (kg) ¹ | 2021 | 2020 | 2019 |
|--|-------|-------|-------|
| with PCB content of over 0.05% | 0 | 0 | 0 |
| with PCB content between 0.005% and 0.05% | 4,223 | 3,560 | 3,043 |
| Total | 4,223 | 3,560 | 3,043 |

¹ The total amount of oil containing PCB in transformers and other equipment as at 31/12/2021 is approximately 50,874 kg.

Materials used

The production and service activities involve the use of process materials acquired from external suppliers, including, for example, products for cooling and lubricating plants and machinery, substances for treating water, and reagents for waste treatment and waste-to-energy processes. In 2021, the Group used 162,910 tons of process materials in total, with a marginal proportion of renewable materials, considering the type of processes managed.

As part of the Group's supplier certification process, qualitative information is specifically requested regarding the use of materials with low emissions, low energy consumption, of recycled or recyclable material and the eventual adoption of procedures for the storage and collection of recyclable materials in order to guarantee recycling.

Environmental compliance and reporting mechanisms

The Environmental Management System (ISO 14001) adopted by the Group involves all employees who are required, as part of their duties, to participate in the process of risk prevention, environmental protection and protection of their own health and safety, of colleagues and third parties. All of the processes are carried out in full compliance with applicable environmental legislations, and the Group contributes to the research and development of advanced technologies aimed at protecting the resources and at reducing the environmental impact and their related risks. During the qualification process, suppliers are required to hold an environmental certificate or, in any case, to have taken on substantial elements interlinked with the environmental system (see page 263).

There are many instruments at the disposal of the stakeholders to report an environmental breach: these methods include written communications via post, e-mail, fax and social media channels. All communications are considered and sent to the competent offices, which carry out to the appropriate checks, and, lastly, each stakeholder receives a response in relations to their reports.

The **production and distribution of electricity** services are certified by standards of quality and environmental management, and are, therefore, subject to internal and external audits with regard to the processes and obligations relevant to environmental legislation. In addition, for electricity and heat production plants covered by the ETS, the annual communication and verification, by accredited third parties, of the CO₂ emitted by the plants is required.

With regard to the **waste management services**, residents and Public Administrations have access to an environmental contact centre where it is possible to report any breaches and/or critical situations pertinent to the environment. Moreover, "Environmental Inspectors" operate in the provinces of Piacenza, Parma and Reggio Emilia, who patrol the areas of competence in order to identify illegal landfills and abandoned waste hazard-ous to the environment. Once a report is received, the Environmental Inspectors organise the verification and treatment activities necessary for the resolution of the problems identified, pursuant to the proper procedures. In addition to this type of reporting, the Inspectors also provide information to residents about correct waste sorting methods and the use of the collection service. Furthermore, specific procedures provide guidelines for operators concerning the processes to be implemented for the solution and/or limitation of any environmental emergencies that may arise during the performance of services.

In relation to **waste-to-energy plants**, emission data are released to the Supervisory Authorities in real time. These figures are public and can be viewed daily on the websites. To ensure IEA provisions on communication anomalies are adhered to, a 24-hour technician service has been established.

In the **integrated water service**, the entire cycle is subjected to constant monitoring of operating parameters, also through remote control systems of the plants, providing for the execution of tens of thousands of laboratory analytical determinations and the continuous improvement of the use of water resources, both in terms of withdrawal and use, and of release and discharge. The integrated water service is also subject to controls pursuant to the law by Local Sector Authorities. The optimisation of the corrective measures put in place to minimise possible negative effects of problems identified, is often carried out through the involvement of other Bodies, including through specific operational protocols.

In 2021, the Group paid 66 fines and penalties (of which 43 related to the years 2008-2010) for a total value of approximately 369,828 Euro (of which 282,444 Euro related to the period 2008-2010), for non-compliance with environmental laws and regulations (Italian Legislative Decree 152/2006). Breaches are mainly related to the absence of discharge permits at certain wastewater treatment plants and the exceeding of limits set out in the tables for wastewater discharge.

