

6.1 Italgas for the future of the planet



SDG



GRI

302, 303, 305, 306.

The Group's commitment to environmental protection and decarbonisation issues runs through all its business components:

- In the distribution of natural gas, the company is called upon to meet the energy needs of its eight million users in a sustainable manner. That is why it is committed to continuously improving its infrastructure as well as extending it, with the aim of making it fully digital and increasingly secure, as well as more accessible. Through digitisation, networks are adapted to accommodate and distribute different and renewable gases such as biomethane, biogas and hydrogen.
- In the water sector, in which Italgas operates, the modernisation of the infrastructure in technological and digital terms enables a more efficient management of such a precious resource, while at the same time improving the quality of the service offered.
- By enhancing the activities of the ESCo Geoside and reducing the Group's energy consumption and emissions, Italgas continues to strengthen its role as an active player in the fight against climate change.

Moreover, Italgas' commitment is reflected in the protection of the ecosystems in which it operates and in the promotion of the circular economy.



Our guiding principles for value creation are the realization of new networks ready to handle renewable gases and the push on efficiency for a streamlined use of resources



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Specific material topics

- Network digitalization and innovation
- Energy transition and fight against climate change
- Management of ecosystem and biodiversity
- Adoption of circular economy principles

Transversal material topics

- Compliance, transparency and fight against corruption
- Responsible governance and risk management
- Economic value generation and ESG finance

Medium-to-long-term impacts of our activities

<ul style="list-style-type: none"> – Decarbonisation of the Country in accordance with EU goals – Mitigation of environmental impacts, protection of the ecosystems, support for the EU circularity goals 	 <p>Natural capital</p>
<ul style="list-style-type: none"> – Safe and efficient access to energy for all – Energy security of the Country – Economic development of the Country 	 <p>Financial capital</p>
<ul style="list-style-type: none"> – Digitalisation, innovation, efficiency, safety and Sustainability of the gas distribution infrastructure – Safe and efficient access to energy for all – Energy security of the Country 	 <p>Manufactured capital</p>
<ul style="list-style-type: none"> – Digitalisation, innovation, efficiency, safety and Sustainability of the gas distribution infrastructure – Energy security of the Country 	 <p>Intellectual capital</p>
<ul style="list-style-type: none"> – Digitalisation, innovation, efficiency, safety and Sustainability of the gas distribution infrastructure – Decarbonisation of the Country in accordance with EU goals – Safe and efficient access to energy for all 	 <p>Relationship capital</p>



We contribute to the fight against climate change

Actions	Target	2022 Performance
Enhancing the activities of ESCo Geoside	<ul style="list-style-type: none"> - 280,000 MWh saved by ESCo customers, corresponding to about 62,000 tons of CO₂, thanks to energy efficiency interventions implemented between 2022 and 2028 	9,530 <hr/> tCO ₂ eq
Reducing the Group's energy consumption and greenhouse gas emissions	<ul style="list-style-type: none"> - -34% of Scope 1 and 2⁷⁴ emissions by 2028, -42% by 2030 (baseline 2020), Net Zero Carbon by 2050 - -27% of net energy consumption by 2028, -30% by 2030 (baseline 2020) - -25% Gas leakage rate⁷⁵ by 2028 (baseline 2020) 	-18.5% <hr/> Scope 1 and 2 emissions
		-20.3% <hr/> net energy consumption
		-13% <hr/> gas leakage rate
Reducing the GHG emissions from the Group's value chain	<ul style="list-style-type: none"> - -30% Scope 3 emissions by 2028 (baseline 2020) 	-25% <hr/> Scope 3 emissions

74. Market-based.

75. Volume of fugitive emissions of natural gas/volume of gas distributed



We count on digitalisation to bring about the energy transition and the decarbonization

Actions	Target ⁷⁶	2022 Performance
Repurposing the network to increase its flexibility and ensure the necessary connections for the distribution of biomethane and hydrogen	<ul style="list-style-type: none"> – 100% network ready to accommodate hydrogen by 2028 – 100% digitised network by 2024 	<p>95% of the network is already compatible with a 20% H2, in blend H2NG (plants currently compatible up to 2%)</p> <p>At the end of 2022, DANA operated 80 of the 767 plants in the Italgas Group's network. There are 2,091 digitised sub-networks, out of the Italgas Group's total of 5,550 sub-networks (total figure as at 31 December 2022)</p>
Extending the network to non-methanised territories	<ul style="list-style-type: none"> – 100,000 new users connected to the extensions of Group's natural gas distribution networks by 2028, in areas currently not methanised, thus replacing more polluting sources, allowing sector coupling and reducing costs for customers 	<p>6,000</p> <p>new users connected to the Group's natural gas distribution network expansions in Italy</p>



We protect ecosystems and promote a circular economy

Actions	Target	2022 Performance
Introducing ecodesign principles in smart meters production	<ul style="list-style-type: none"> – 50% of all active smart meters designed according to «Design for environment» criteria in lieu of GPRS meters by 2028 	<p>In 2022, the first prototype was produced and manufactured, and around 20,000 pre-series pieces are scheduled for production towards the end of 2023</p>
Reducing the amount of waste sent on for disposal	<ul style="list-style-type: none"> – 100% of waste produced annually by the Group sent on for recovery by 2028 – 93% of waste produced annually by the contractors of the Group sent on for recovery by 2028 	<p>97.6%</p> <p>of annual waste produced by the Group sent for recovery</p> <p>94.5%</p> <p>of annual waste produced by the Group's contractors sent for recovery</p>
Managing and mitigating the impact of the Group on the ecosystems	<ul style="list-style-type: none"> – Realisation by 2024 of an integrated model for the evaluation, management and monitoring of the impacts of Group activities on the ecosystems 	<p>Issuance of Guidelines for Biodiversity and Ecosystem Services (BES) Management and Ecological Sensitivity Mapping for the Biodiversity of Italgas Assets</p>

76. The targets refer to the scope of Group companies consolidated on a line-by-line basis as at 2021, thus not including any changes as a result of ATEM tenders, M&A transactions and DEPA Infrastructure.

6.1.1 Network innovation and digitisation to enable energy transition and decarbonisation

The innovation is the main driver of the Italgas development strategy. The Company's capacity to consolidate its leadership position in Italy and Europe by being at the forefront, also at a global level, in the gas distribution segment, is driven by technological innovation.

The 2022-2028 Strategic Plan has recorded an increase in investments, mainly driven by digitisation. With the aim of completing the digital transformation of assets and making Italgas to all intents and purposes a leader in the energy transition, the Group has allocated more than € 1.5 billion (+100 million on the previous Plan) to the digitisation of the networks; a plan in line with the European decarbonisation objectives and the development of renewable gases such as biomethane, synthetic methane and green hydrogen.

Scheduled Gas Leakage Detection

For leak detection activities, since 2018 Italgas has been implementing CRDS technology (Cavity Ring-Down Spectroscopy) – developed by the US company Picarro Inc.: this is a sophisticated sensing technology that, compared to traditional technologies, offers significant advantages in terms of speed of execution and the size of the areas subject to inspection and the accuracy of readings; in fact, it is equipped for:

- detecting fugitive emissions with a sensitivity three times greater than those currently used by all other industry players (parts per billion vs parts per million);
- detecting a gas leak even at a distance of several dozen metres from the route covered by the equipped vehicle, thanks to specific on-board sensors and sophisticated calculation software.

This makes Italgas one of the first, very few, gas distributors in Italy and Europe to carry out scheduled gas leakage detection, also extended to all the underground and overhead connections, albeit this activity is not prescribed by current legislation and regulations. Right from the first applications, the technology – which is now a full part of the management of the distribution network – has made it possible to inspect the whole of the Group's network on an annual basis, i.e. respectively three (for high-/medium-pressure pipes) and four (for low-pressure pipes) times the annual requirement laid down by ARERA.

This technology, coupled with the subsequent localisation and elimination of leaks, puts Italgas in a cutting-edge position, also in terms of the work it does to limit leaks, a topic to which the European Commission pays close attention.

With the proper start-up of the land-based network monitoring system using CRDS technology, Italgas has also applied the system in different, very specific urban contexts, like Venice, where the natural gas distribution network has no equals worldwide, due to the undersea pipes, clamped to the arches of the bridges or below the pedestrian crossings. The network monitoring in

the lagoon is thus carried out using a boat equipped in a similar manner to the cars and that applies and benefits from the same specifications.

In addition, to improve the efficiency and safety of its networks, in 2022 Italgas adopted GIS4WARD, an application developed as a team by the Asset Performance & Technology Departments of Italgas Reti and Bludigit, in partnership with the Polytechnic University of Turin, which will project the Group towards increasingly smarter and more proactive network maintenance. This technology, in fact, enables one of the world's most advanced approaches to predictive maintenance applied to gas networks, based on a virtual ecosystem that, through the creation of "behavioural maps" of pipelines, obtained by combining data collected from digital networks and surveys carried out with the CRDS Picarro technology, allows targeted investments to be planned in order to further reduce network leakage and the Company's carbon footprint.

Digitisation of the reduction units

Thanks to new digital technologies, Italgas Reti has started completion of the digitisation and remote supervision of network infrastructures and systems, through the installation of sensors and actuators, directly connected to RTUs (Remote Terminal Units) for two-way communication between the field and the control and command centre. During 2022, the project continued – within the Digital Factory – to develop and integrate into the application map the new tool that would allow the greatest possible benefit to be derived from the digitisation and remote supervision project. This application, one-of-a-kind worldwide and developed entirely by Italgas and Bludigit, is called DANA (Digital Advanced Network Automation) and has an in-built GIS (Geographical Information System) and a SCADA-type supervision system, which benefits from the support of dedicated HMIs (Human Machine Interfaces), precisely with the aim of managing and controlling the network as a whole from a single operating room, including renewable gas injections such as connections with biomethane production plants. In 2022, DANA's roll-out began on the Group's distribution plants: at the end of the year, 21 Italgas Reti plants and 63 Medea plants were remotely controlled by means of DANA. It is expected that by the end of 2024, the whole of the Group's plants will be remotely controlled on DANA.

Other significant activities

In Italgas Reti's Device and Material Testing (LAB) laboratories, within the centre of technological excellence in Asti that operates according to the standard ISO 17025 for the tests and calibrations indicated on the accreditation certificates on the Accredia website, test and calibration methods are developed and updated in connection with innovative systems and products for each individual production process and the various specialised activities connected with gas distribution are monitored. In 2022, activities continued in relation to instrumental tests on gas odourisation, the calibration of gas meters and other instrumentation supporting gas distribution activities, as well as mechanical tests on network materials.

The integration of green gases in the networks

The transformation of the networks involves digitisation, but not only this. Over the period 2022-2028, Italgas planned around € 100 million of investments related to new biomethane connections. The main green gas development initiatives include:

- the Power-to-Gas pilot project in Sardinia, near Cagliari, the very first application in the UE, aimed at verifying the whole green hydrogen chain, from the production of hydrogen from electricity produced by photovoltaic panels, to the distribution in the networks and the end uses, such as mobility, industrial applications and residential uses, which is scheduled to be launched in 2024. Italgas believes that Power-to-Gas technology is another way in which gas and electricity sectors are merging, able to offer a reliable solution to the problem of the reduced programmability of renewable resources. The plant will be connected to the new “digital native” networks that Italgas, through the associate Medea, has developed in Sardinia. The region, which was once the only one in Italy not reached by natural gas, can, in fact, today boast the country’s most modern infrastructure; a network that guarantees greater efficiency and quality of gas distribution service, and which, thanks also to this project, will allow renewable gas to be received and distributed to end customers, making the achievement of decarbonisation targets ever more concrete;
- the design and development of a new generation, hydrogen ready Italgas smart meter, which integrates green gas metering and management functions. In 2022, the first prototype was produced and manufactured, and around 20,000 pre-series pieces are scheduled for production and field installation towards the end of 2023, followed by the subsequent commercial launch expected for end 2024;
- the Italgas laboratory revamping plan, through the revision of the mission, the activities and their organisation, pursuing the aim of transforming them into a real centre of European excellence on the natural gas front and new renewable gases in support of the energy transition;
- The development of a reverse flow project in support of the Italyn biomethane chain development, consisting of the design of innovative two-way distribution plants that enable the reversal of gas flow (from the local distribution network to the national transmission network) in the presence of an introduction of biomethane that cannot be completely absorbed by the distribution network during periods of low user demand. More specifically, through the development of bi-REMI cabins, the distribution network can be evolved from a mere infrastructure for taking energy to end customers to an evolved tool for the collection of gas and the relaunch onto the transmission network of renewable and non-renewable gas.



Power to Gas Rendering
Sardinia

The possibility of improving performance in terms of technical and commercial quality also depends on the technological component made available to the customer. In this respect, Italgas has substantially completed the replacement of traditional meters with new generation digital smart meters with new functions. See paragraph 4.3 "Operating performance" for further details.

Bludigit and digital network transformation

The optimal trade-off of innovative drive and safety, resilience and sustainability of solutions is the aim of Italgas' digital transformation, which in 2022 took another important step forward in terms of evolution of the business capability and way of working.

Lastly, new machine learning solutions have been developed, capable of expanding predictive maintenance to other assets in the digitised network, as well as optimising the use and set-up of those assets.

As part of the innovation and digital transformation process pursued by Italgas, Bludigit, the Group's new company, was established in 2021 with the aim of offering the market new proprietary technology solutions through an ecosystem of technology partners. Through the Digital Factory, i.e. the Group's innovation hub, Bludigit has been helping to digitise processes and improve operations as well as assisting in network management and service quality since 2018.

In 2022 Bludigit continued to effectively support the achievement of the Group sustainability targets, thanks to the numerous initiatives aimed at optimising the digital solutions and the use of the cloud resources needed, redesigning processes taking a paperless approach and contributing to the ecological transition through all projects striving to achieve complete network digitisation. Some examples are: the new AMPER-billing solution, the GIS4WARD Smart Maintenance solution, the digitisation of the odouriser replenishment processes, the digitisation of health surveillance processes, the new facility management platform.

In 2022, Bludigit consolidated its business engagement and performance and investment control model, which ensured further scale-up of the digital transformation plan along with the value it will bring to the business.

Finally, Bludigit will assure the IT integration and digital transformation of the companies within the DEPA Infrastructure Group scope.

6.1.2 Attention to the environment

The challenges contained in the Sustainable Value Creation Plan, already included in the 2022-2028 Strategic Plan, have led to a review of the specific targets in terms of further reductions in emissions and energy consumption, in line with the climate targets, also long-term, set by the European Union.

The sustainability targets set for 2028 aim to reduce CO₂ emissions and energy consumption, allowing the Group to stay ahead of the EU's 2030 targets. Thanks to network digitisation and technological innovations, Italgas expects to have reduced climate-changing emissions (Scope 1 and Scope 2) by 34% and net energy consumption by 27% by 2028, both compared to 2020 levels⁷⁷. Furthermore, the Italgas Group has set itself targets in line with the main timelines defined by the Green Deal: -42% in climate-altering emissions and -33% net in energy consumption by 2030 (with the same baseline and scope as defined for the previous targets) and a "Net Zero Carbon Target" by 2050, based on the above initiatives and carbon removal activities from 2030 onwards.

Lastly, the Group has also set specific targets on Scope 3 greenhouse gas emissions related to its supply chain, planning a 30% reduction by 2028 and a 33% reduction by 2030 compared to 2020⁷⁸, through increased engagement with its suppliers. The Group has also set itself a "Net Zero Carbon Target" for Scope 3 emissions by 2050, also based on carbon removal activities from 2030 onwards.

Italgas plans to make significant contributions to the achievement of the sustainability targets thanks to various initiatives developed with Geoside, the Group's ESCo, aimed at energy efficiency of the Group's assets in both the industrial and civil sectors, training activities for employees on energy efficiency issues, as well as the development of a predictive maintenance plan on gas networks, aiming to drastically reduce dispersion in the atmosphere.

77. With the same scope, excluding any changes following M&As, DEPA Infrastructure and ATEM (Minimum Territorial Area) tenders.

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With regard to civil consumption, the restructuring of several important company offices already completed, already under way or planned, will help further reduce the energy demand and, as a result, related emissions. Lastly, net industrial electricity consumption is also expected to be cut significantly, due to the commissioning of innovative cogeneration and turbo-expansion plants at some Italgas Reti citygates, which will allow self-generated electricity to be used to satisfy the Group's needs (the four plants installed during 2022 at Pantano (RM), Riva at Chieri (TO), Rosta (TO) and Caselette (TO) will be fully operational starting from the early months of 2023).

Policies and commitments

All Italgas' business is carried out paying close attention to the environment, natural resources and public and personal safety, considering all these as key factors to the sustainable development of the business and the territory.

The commitment on these issues is expressed in the "Health, Safety, Environment, Quality and Energy Policy (HSEQE)" of the Italgas Group, developed on the basis of company policies and in line with the Code of Ethics aimed at enhancing and protecting natural and human resources, essential values for the Company. This Policy stresses the Company's commitment to considering its Integrated Management System one of the main stimuli for involving personnel and improving its processes, basing operational choices on correctness, professionalism and compliance, to ensure the supply of a service based on the best quality standards in order to satisfy Customer expectations.

Some of the commitments on which the Policy is based are stated below:

- to guarantee, using suitable management and organisational procedural tools, the Customer's right to the accessibility and use of services;
- to optimise company processes in order to reach maximum efficiency and effectiveness levels, in compliance with the health and safety of workers and maximum attention for the environment;
- to design, implement, manage and dispose of facilities, constructions and assets, to protect worker health and safety, the environment, energy savings, while aligning with the best technologies available and sustainable economically;
- to conduct and manage activities in order to prevent incidents, accidents and occupational diseases;
- to ensure the information, training, and awareness of personnel for an active and responsible participation in the implementation of the principles and the achievement of the objectives;
- to implement sustainable use of natural resources, prevent pollution and protect ecosystems and biodiversity;
- to implement operational and management actions to reduce greenhouse gas emissions, with a climate change mitigation approach;
- to manage waste to reduce its production and promote recovery in its final destination.

In line with the Group's Management Models, the Company applies a regulatory system which aims to guarantee the safety and health of people (employees, end customers, contractors, etc.), prevent accidents, ensure the protection of the environment and public safety and the rational use of energy.

The effective implementation of the policy in relation to issues of health, safety and the environment is guaranteed and monitored by the department responsible for the direction, management and control of HSE activities. In 2022, 43,007 hours of training on HSE aspects were delivered. In addition, more than 400 awareness-raising/information meetings have been held for employees and approximately 40 for contractors, involving more than 160 companies.


During 2022, the Italgas Group did not receive any significant sanctions for breaching environmental laws and regulations, just like in the two previous years.


Due to the short period of consolidation of the Greek companies (September-December 2022), the data and information reported in this chapter refer to the Italgas perimeter (referred to as "Group") and, where available, also to the Greek perimeter, which is presented separately. The detailed analyses, for the reasons set out above, therefore refer to the Italgas perimeter.

Consumption

The energy source used the most in the Group's activities is natural gas, in both civil and industrial uses, and for vehicles. Since 2016, Italgas has been monitoring its consumption with the aim of reducing its environmental impact over time according to a continuous improvement process in line with the objectives identified in its 2022-2028 Strategic Plan.

Energy consumption totalled 472,0 TJ in 2022. The figure shows a marked improvement over 2021 (-125.2 TJ, corresponding to a reduction of -21.0%).

 Italy					
Net energy consumption ⁷⁹	u.m.	2020	2021	2022 ⁸⁰	% Change 2021-2022
Fuel energy consumption for industrial use	TJ	322.5	319.3	242.6	-24.0%
Fuel energy consumption for civil use	TJ	45.5	46.7	32.4	-30.6%
Fuel energy consumption for vehicles	TJ	123.0	137.2	111.5 ⁸¹	-18.7%
Net electricity consumption for industrial use	TJ	56.8	56.6	51.7	-8.7%
Net electricity consumption for civil use	TJ	44.0	37.1	33.5	-9.7%
Thermal energy consumption for civil use	TJ	0.3	0.3	0.3	0.0%
Total	TJ	592.1	597.2	472.0	-21.0%

 Greece		
Net energy consumption	u.m.	Sep-Dec 2022
Fuel energy consumption for industrial use	TJ	1.2
Fuel energy consumption for civil use	TJ	0.5
Fuel energy consumption for vehicles	TJ	4.5
Net electricity consumption for industrial use	TJ	0.4
Net electricity consumption for civil use	TJ	2.1
Total	TJ	8.7

Fuel energy consumption for industrial use

In 2022, fuel energy consumption for industrial use recorded a decrease of 76.7 TJ, falling from 319.3 TJ to 242.6 TJ (-24.0% compared to 2021).

Thanks to the efficiency initiatives implemented, a decrease was recorded in industrial self-consumption of natural gas for the gas preheating process: over the year, at Italgas Reti, 392 preheating optimisation systems were installed, while Toscana Energia completed the efficiency campaign on its plants.

79. This refers to total energy consumption, from which any self-produced and self-consumed electricity consumption is subtracted. Geoside's consumption related to heat management and energy service contracts is not counted. These contracts provide for the registration of gas and district heating supplies to Geoside in order to provide the heating service to the managed buildings. For 2022, consumption is as follows: 9,561.160 MWh (equivalent to 34.4 TJ) for "district heating energy/heat management services", 2,984,971 sm³ of methane (equivalent to 117.6 TJ) for "energy/heat management services".

80. The 2022 consumption values have been calculated using the ISPRA 2022 conversion factors - Table of national standard parameters: standard parameters - fuels/materials.

81. In 2022, we were able to subdivide the mileage for private and business use of cars so that only the consumption and emissions for business use would be taken into account. The reduction in private use mileage means a reduction of about 3 million km on an annual basis, which corresponds to a decrease in fuel consumption of 8.5 TJ (from 120.0 to 111.5) and emissions of 1.4 10³ tonnes CO₂ (from 5.9 to 4.5).

These interventions, alongside operational and maintenance initiatives, contributed to:

- an overall saving of approximately 1,370 10^3 Sm^3 compared to 2021⁸², 1,085 for Italgas Reti and 285 for Toscana Energia (corresponding to a total of 2,728 tCO₂ of emissions avoided);
- a reduction in the specific consumption⁸³ of the plants of Italgas Reti and Toscana Energia, which decreased from 1.18 in 2021 to 1.01 in 2022, a change of -14.4%.

In December, Toscana Energia completed the installation of the equi-distributors, which will already guarantee further savings during the 2022-2023 heating season. Also considering the work carried out in past years, Italgas Reti's Reduction and Measurement Collection Plants (IPRMs) equipped with pre-heating systems that use consumption optimisation technology will total 620 at the end of 2022; by 2023, moreover, the plan to install such systems at all IPRMs is expected to be completed.

For Italgas Reti, an innovative preheating management system entirely developed by the Company, called IPS (Integrated Pre-Heated System), has been installed at an IPRM site located in Abbadia (NO); this will see greater use in 2023 to further reduce natural gas consumption for preheating. This solution is mounted inside a container, and provides for a phase change thermal storage with two distinct thermal sources, operating in parallel: a micro-cogenerator and an air-water heat pump unit powered mainly by self-generated electricity (solar thermal and/or photovoltaic).

LPG consumption can be traced to Medea: in 2022, thanks to the conversion of the smaller and less efficient LPG plants to latest-generation LNG, this consumption reduced by approximately 21%; in addition to the positive results obtained to date, for 2023, various other optimisation activities and action to increase energy efficiency have been planned, to further reduce the Company's energy impact.

Fuel energy consumption for civil use

The Italgas Group also pursues sustainability goals through constant renovation of its real estate assets, management and continuous monitoring of consumption and by introducing digital technologies.

In 2022, numerous actions were implemented to reduce methane gas consumption (-30.6% on 2021), including, for example: optimal management of heating and/or air conditioning plants and the related set-points, delayed switch-on of such according to external climate conditions, greater segmentation of plants in the main sites so as to allow for their switch-off when no staff are in the premises and prolonged closure of the sites during the Christmas holidays.

The virtuous reduction of civil consumption, now an integral part of real estate management, will continue during 2023 along the following lines:

- the process to renew building stock;
- installation of photovoltaic systems to increase the amount of electricity self-produced and consumed on site;
- extension to all the Group's operating sites of the ability to monitor consumption in real time and analyse it using the proprietary platform developed by Geoside, thanks to introduction of smart sensors.

Fuel energy consumption for vehicles

The entire vehicle fleet was renewed on the basis of the following strategic drivers:

- the improvement of sustainability criteria in the short, medium and long-term, both in respect of reducing polluting emissions (CO₂, NO_x and PM) and in terms of limiting expenditure for fleet operation;
- the increased availability of operative vehicles, by reducing maintenance and repair time;
- the rationalisation of the number of vehicles in the fleet.

During 2022, lines of action were pursued mainly to reduce emissions and make the vehicle fleet more efficient. In particular, the actions included:


- training of more than 300 employees in safe, sustainable driving courses;


82. The calculation considers the comparison with consumption that would have been obtained in the absence of optimisation (with reference to the formula used for the reporting of the savings to ENEA pursuant to Article 7, subsection 8 of Legislative Decree 102/2014).

83. Specific consumption, i.e. consumption of natural gas for preheating per 1,000 Sm³ of gas injected into the network, expressed in Sm³ preheating/10³ Sm³ gas injected into the network.

- the introduction of digital solutions for carrying out operational activities such as the applications released by the Digital Factory, which allow employees to optimise travel necessary in the territory.

The 2022 distances travelled by all car types decreased, with a total of almost 8.7 million fewer kilometres driven than in 2021 (-20.4%). In terms of energy consumption, there is also a reduction of 18.7% TJ in 2022 compared to 2021.

 Italy				
Total kilometers travelled	u.m.	2020	2021	2022
Diesel	M of km	4.5	4.9	1.7
Petrol	M of km	7.1	6.1	10.1
Methane	M of km	26.2	31.8	22.2
total	M of km	37.8	42.8	34.0

 Greece			
Total kilometers travelled		u.m.	Sep-Dec 2022
Diesel		M of km	0.6
Petrol		M of km	0.3
Methane		M of km	0.6
total		M of km	1.6

Net electricity consumption for industrial use

Net electricity consumption for industrial use dropped by 8.7% compared to the previous financial year, despite the fact that various new users (PODs) were activated in 2022 connected with the installation of the Final Digitised Reduction Groups (GRFDs), which generated additional consumption of 120 MWh for Italgas Reti and 20 MWh for Toscana Energia.

Experimental installation continued of:

- direct-drive meters inserted into the electrical panels, at IPRMs, which allow for the monitoring of the general consumption and secondary utilities (cathode or light protection), enabling more detailed analysis, also with a view to certification in accordance with ISO 50001: 2018;
- innovative systems enabling energy to be recovered by means of microturbines at GRFDs. These systems harness the energy otherwise dissipated by the gas pressure reduction process, turning it into electricity available for use on site (energy harvesting systems).

In Toscana Energia, a saving in electricity consumption of 6.5% in 2022 was observed. The reasons for this trend are mainly to be found in the optimised operation of electro-circulators on upgraded preheating systems.

In 2023, Italgas Reti plans to replace traditional circulators with inverter-driven electro-circulators inside thermal power plants for preheating, revamp existing photovoltaic plants with more efficient modules, as well as new installations of photovoltaic plants on both IPRMs and GRFDs, to ensure the self-production of the electricity needed to satisfy the needs of the new digitised plants.

Medea saw an increase in electricity consumption of 31.9% in 2022. This increase, in line with the company's expansion and development, is essentially due to the start-up of the new LNG plants: between 2021 and 2022, the number of LNG plants tripled to an impressive 68 units. These new systems meet the highest safety and quality requirements with low power consumption.

Italgas Acqua's electricity consumption, which represents the company's entire industrial consumption, also decreased by 17.6% compared to the previous year. Continuing on from the work carried out in the last months of 2021, further pressure regulation actions were implemented in 2022 to optimise the operation of the pumping plants. The installation of pumps with brushless motors, which are state-of-the-art in terms of energy efficiency, was also tested and gradually implemented. The installation started with the most energy-intensive pumping systems, and in particular those that required the replacement of the pump and motor that had reached the end of their useful life, which resulted in a significant improvement in electricity consumption.

Net electricity consumption for civil use

In 2022, in-depth analyses were performed of electricity consumption, starting from the main properties used by the Group. This activity made it possible to identify actions to reduce this consumption, for example through a structured, national programme to replace lighting fixtures with LED technology, the optimal configuration, modulated over the course of the year, of the operating logics of lighting outside buildings, the reduction of so-called "baseload" consumption of building operations (e.g. mechanical ventilation, internal lighting, consumption of network equipment and air conditioning of rooms used to house them) and even greater system regulation accuracy during the summer season. All the above, together with adoption of smart working (working from home) for the entire period and the closure of some offices during the Christmas holidays, resulted in a 9.7% decrease in electricity consumed for civil use compared to 2021.

On the basis of the interventions implemented to reduce fuel and electricity, in 2022, over all the Group's buildings, a reduction was recorded of 20.5% in energy consumed per square metre for the operation of the company sites, compared with 2021: 0.66 GJ/m² in 2022 compared to 0.83 GJ/m² in 2021.

Photovoltaic

Through its subsidiary, Geoside, the Group manages 18 photovoltaic plants, which it took over possession following the acquisition of a subsidiary of Toscana Energia (Toscana Energia Green, now merged into Geoside); below is their electricity production transferred to the GSE (Energy Services Manager) insofar as not self-consumed by the Group, and the related emissions avoided by third parties using it.

Italy						
Photovoltaic	2020		2021		2022	
	kWh	TJ	kWh	TJ	kWh	TJ
Dedicated collection by GSE	8,876,626	31.96	9,284,818	33.43	8,640,476	31.11
Emissions avoided for self-produced energy, transferred to the GSE and used by third parties (tCO ₂ eq)		2,337.8		2,419.0		2,270.2

Lastly, please refer to the table "Consumption and emissions avoided for the Group" for the values of Group self-consumed electricity and the related emissions avoided.

Greenhouse gas emissions


Fully in line with what was done in relation to consumption, for years Italgas has also monitored its greenhouse gas emissions, with the objective of reducing its carbon footprint according to a continuous improvement process in line with the objectives identified in its 2022-2028 Strategic Plan.

Italgas has recorded the following emissions:

- Direct emissions (Scope 1): deriving from the civil consumption of gas, from industrial consumption of gas for preheating, from fuel consumptions for vehicles and grid losses ("fugitive emissions");
- Indirect emissions (Scope 2): deriving from the consumption of electricity and heating purchased;

- Other Indirect Emissions (Scope 3): arising from travel (business travel), outsourced activities (supply chain) and emissions related to purchased energy production.

The Italgas Group's main greenhouse gas emission contribution is from fugitive emissions of natural gas from distribution networks, distributed gas preheating processes in the decompression systems and the use of cars in the corporate fleet.

 Italy					
Scope 1 and Scope 2 ⁸⁴	u.m.	2020	2021	2022 ⁸⁵	Change % 2021-2022
Fugitive gas emissions ⁸⁶	(10 ³ tCO ₂ eq)	146.6	133.4	120.0	-10.0%
Emissions from gas consumption for industrial use	(10 ³ tCO ₂ eq)	18.2	18.1	13.8	-23.8%
Emissions from gas consumption for civil use	(10 ³ tCO ₂ eq)	2.6	2.6	1.8	-30.8%
Emissions from fuel consumption for vehicles	(10 ³ tCO ₂ eq)	5.7	6.4	5.4 ⁸⁷	-15.6%
Emissions from thermal energy for civil use	(10 ³ tCO ₂ eq)	0.0	0.0	0.0	0%
Emissions from electricity consumption for industrial use	(10 ³ tCO ₂ eq)	0.2	0.0	0.0	0%
Emissions from electricity consumption for civil use	(10 ³ tCO ₂ eq)		0.2	0.2	0%
Total	(10 ³ tCO ₂ eq)	173.3	160.7	141.2	-12.1%

2022 saw a drop in total Scope 1 and Scope 2 emissions of 12.1% compared to the previous financial year. The main components that contributed to this decrease are fugitive emissions and emissions from gas consumption for industrial use, which in total make up about 95% of the total Scope 1 and Scope 2 emissions.


Gas emissions for civil and industrial use are in line with the consumption trend described in the "Consumption" section, while emissions from transport fuel consumption decreased by 15.6%, in line with the aforementioned trend. The initiatives implemented resulted in an overall reduction of more than 42% in NO_x emissions on 2021 (0.085 gNO_x/km). Another significant parameter is the value of Particulates (0.0005 gPart/km). The savings obtained, if the same number of kilometres had been travelled using a non-bifuel and older fleet of operations vehicles, is quantified as ranging between 50 and 55% of nitrogen oxides and 1500% of particulate; CO₂ savings amounted to 1.5 thousand tonnes. These indicators provide further representation of the capacity to reduce emissions levels, brought about by the fleet transformation project.

84. Scope 2 market-based.

85. The 2022 emission values were calculated using the ISPRA 2022 Emission Factors – Table of national standard parameters: standard parameters – fuels/materials

86. Thanks to the collaboration with the Polytechnic University of Turin to estimate the fugitive emissions that cannot be quantified with the CRDS system, the values for 2022 also include the estimate of emissions from permeation, operational, due to maintenance on reduction units and for meter replacements (about 0.97% of total fugitive emissions).

87. In 2022, we were able to subdivide the mileage for private and business use of cars so that only the consumption and emissions for business use would be taken into account. The reduction in private use mileage means a reduction of about 3 million km on an annual basis, which corresponds to a decrease in fuel consumption of 8.5 TJ (from 120.0 to 111.5) and emissions of 1.4 10³ tonnes CO₂ (from 5.9 to 4.5).

 Greece		
Scope 1 and Scope 2 ⁸⁸	u.m.	Sep-Dec 2022
Fugitive gas emissions ⁸⁹	(10 ³ tCO ₂ eq)	6.29
Emissions from gas consumption for industrial use	(10 ³ tCO ₂ eq)	0.07
Emissions from gas consumption for civil use	(10 ³ tCO ₂ eq)	0.03
Emissions from fuel consumption for vehicles	(10 ³ tCO ₂ eq)	0.20
Emissions from electricity consumption for industrial use	(10 ³ tCO ₂ eq)	0.05
Emissions from electricity consumption for civil use	(10 ³ tCO ₂ eq)	0.26
Total	(10 ³ tCO ₂ eq)	6.90

Fugitive emissions

The Italgas Group's fugitive emissions for 2022 decreased considerably, equal to -10.1% compared to 2021. The result achieved becomes even more significant since, for the first time, some portions of Italgas Reti's network were inspected for planned gas leakage searches more than once during the year.

A more specific analysis of the characteristic KPIs of the process shows substantial parity on the indicator of the fugitive emissions to transported gas ratio and a clear decrease (-15.2%) for the indicator of the ratio of emissions to km of the network.

The prompt inspection, localisation and repair of leaks also produced an important result in terms of savings of fugitive emissions into the atmosphere. In 2022, thanks to the operational effort in the prompt elimination of leaks, emissions avoided made up around 33% of total emissions⁹⁰.

A number of important partnerships and initiatives were confirmed in the year 2022, with a view to continuous improvement and development of fugitive emission research and evaluation:

1. The use of an innovative approach, developed in collaboration with Picarro, in the assessment of measurement uncertainty, which uses Bayes' theorem and statistical analysis of data samples.
2. The continued collaboration with the Polytechnic University of Turin to estimate fugitive emissions that cannot be quantified using the CRDS system, which are typically operational emissions or emissions related to the permeability of certain materials.
3. The development of the Smart Maintenance GIS4WARD platform.

The work carried out by the Italgas Group, thanks to its partnership with the Polytechnic University of Turin, made it possible to confirm the prestigious 'Gold Standard' in the OGMP 2.0 voluntary partnership in 2022. This important recognition rewards not only the absolute reduction of fugitive emissions into the atmosphere, but also the effort and commitment of the Italgas Group in promoting best practices within the industry.

88. Scope 2 market-based.

89. Note that the km of network used for this KPIs are related to the ARERA consistency declared in the previous year (i.e. for 2022 as at 31/12/2021). In addition, for 2022 the network kilometres investigated in a second phase were also accounted for. For the other gas network consistency of Medea, an average consistency for the previous year was considered, given the variability due to multiple conversions of the networks to natural gas during the year.

90. Total emissions that would be obtained considering the maximum emission time, i.e. one year.

Italy				
	u.m.	2020	2021	2022
Total natural gas fugitive emissions	10 ⁶ Sm ³	8.5	7.7	6.9
Total fugitive emissions in CO ₂ eq	10 ³ tCO ₂ eq	146.6	133.4	120.0
Gas distributed	10 ⁶ Sm ³	8,477.0	8,886.7	7,961.3
Gas Leakage Rate (natural gas fugitive emissions / gas distributed)	Sm ³ / Sm ³	0.100%	0.087%	0.087%
Network inspected ⁹¹	km	71,184.5	7,145.2	76,491.0
Fugitive emissions of natural gas / network inspected	Sm ³ / km	118.9	106.7	90.5

Scope 2 emissions

Italy				
	u.m.	2020	2021	2022
Location-based Scope 2 emissions	10 ³ tCO ₂ eq	7.3	6.4	6.2
Market-based ⁹² Scope 2 emissions	10 ³ tCO ₂ eq	0.2	0.2	0.2

Market-based indirect Scope 2 emissions are substantially in line with 2021, as a result of purchasing electricity produced from certified renewable sources, as certified by the Guarantees of Origin (GO) management system.

Scope 3 emissions

Italy				
	u.m.	2020	2021	2022
Capital goods	10 ³ tCO ₂ eq	106.0	94.5	88.2
Purchased goods and services	10 ³ tCO ₂ eq	63.3	47.3	43.2
Upstream transportation and distribution	10 ³ tCO ₂ eq	6.2	3.6	4.0
Waste generated in operations	10 ³ tCO ₂ eq	7.0	1.4	1.5
Upstream leased assets	10 ³ tCO ₂ eq	0.8	0.4	0.5
Total Scope 3 – Supply chain	10³tCO₂eq	183.3	147.2	137.5
Fuel-and-energy-related activities (not included in Scope 1 or 2)	10 ³ tCO ₂ eq	4.0	4.1	3.3
Business travel	10 ³ tCO ₂ eq	0.6	0.8	1.2
Total Scope 3	10³tCO₂eq	187.9	152.1	142.0

In 2022, the Group adopted a new calculation model for Scope 3 emissions related to the supply chain. It was possible to move from a spend-based approach to a more specific approach using emission factors requested directly from suppliers (more details in the Section "Supply-chain emission analysis"). The 2020 and 2021 Scope 3 GHG emissions - Supply-chain emissions were recalculated using the new methodology.

Scope 3 - Supply-chain emissions in 2022 are 137.5 10³ tonnes CO₂, down by 6.6% compared to the previous year.


91. Note that the km of network used for this KPIs are related to the ARERA consistency declared in the previous year (i.e. for 2022 as at 31/12/2021). In addition, for 2022 the network kilometres investigated in a second phase were also accounted for. For the other gas network consistency of Medea, an average consistency for the previous year was considered, given the variability due to multiple conversions of the networks to natural gas during the year.

92. The calculation of market-based Scope 2 emissions requires that the emission quota related to renewable sources be null and that the residual mix type emission factor be used for the quota not covered by such contracts. (Source used - https://www.aib-net.org/sites/default/files/assets/facts/residual-mix/2021/AIB_2021_Residual_Mix_Results_1_1.pdf).

The plan for achieving the supply-chain emission reduction targets includes:

- involvement of the supply-chain - awareness and training to achieve more supplier engagement;
- inclusion of reward criteria in supplier tenders, according to the level of adoption of best practices in relation to GHG emission reduction;

Consumption and emissions avoided for the group

 Italy						
GRI 302-4 Reduction of energy consumption	2020		2021		2022	
	TJ	tCO ₂ eq	TJ	tCO ₂ eq	TJ	tCO ₂ eq
Network conversion from LPG to natural gas	23.1	217.0	69.4	669.5	97.3	938.2
Renovation of the site at Largo Regio Parco 11 and 9 in Turin	6.47	382.0	12.0	771.9	19.9	1,268.9
Management interventions and optimisation of the use of civil buildings	-	-	-	-	11.9	698.0
Management interventions and optimisation of the use of preheating plants	-	-	-	-	30.4	1,712.2
Installation of smart meters	2.6	192.0	5.2	379.8	5.2	382.1
Replacement of lighting with LED bulbs	-	-	0.5	36.9	0.5	36.9
Photovoltaic - Self-consumption	0.5	33.4	0.5	33.4	0.5	33.4
Total emissions avoided	32.7	824.4	87.6	1,891.5	165.7	5,069.7

Third-party emissions avoided by ESCo Geoside activities

Geoside is the ESCO of the Italgas Group. Among other activities, it proposes and performs energy efficiency interventions for its public and private customers in a residential and industrial context.

Specifically, the EPCs – Energy Performance Contracts – in place require that the savings generated following interventions be guaranteed and suitably measured.

In the public sector, the main tool used is funding via third parties envisaged by Italy's Legislative Decree 115/2008, often combined with the project financing, governed by the Tenders Code (Italy's Legislative Decree 50/2016). The proposals are characterised by the assumption of risk, against the standards offered, at the full expense of the proposing party and the contracts provide for an economic rebalancing mechanism to the benefit of the Administration, if the minimum objectives are not successfully guaranteed.

The remuneration mainly derives from the saving levels achieved, which must be able to generate the necessary cash flows to repay the investments.

The EPCs predominantly concern interventions

- on the air conditioning systems, generally powered by methane gas;
- on the public lighting systems, powered by electricity;
- to construct photovoltaic plants, which reduce withdrawals of electricity from the network.

93. Values for consumption and emission reductions are based on the year 2019 as a baseline.

In 2022, these interventions made it possible to achieve the following results, calculated using historical consumption figures:

Italy							
Energy carrier	u.m.	2021 Saving	2021 Saving (GJ)	2021 Saving (tCO ₂ eq)	2022 Saving	2022 Saving (GJ)	2022 Saving (tCO ₂ eq)
Electricity	MWh	8,746.0	31,485.6	2,148.9	9,326.0	33.6	2.3
Methane gas	Sm ³	200,471.4	6,928.3	397.5	200,348	7.1	0.4

Italy					
FV Plants	u.m.	2021	2021 Saving (tCO ₂ eq)	2022	2022 Saving (tCO ₂ eq)
EPC plant production	MWh	2,311.8	602.3	2,309	601.6

Waste production and disposal⁹⁴

As required by the environmental management system, the company carries out an assessment of environmental aspects and impacts, in which processes and activities that generate or could generate waste are analysed; the analysis is performed both on waste generated directly by the Group as well as that which is generated by its contractors.

Both processes and activities are periodically analysed in order to prevent waste generation; furthermore, in order to put waste into more effective recovery and reuse circuits at the expense of waste disposal, transporters and destination plants are selected that manage the waste produced by the organisation at the end of its life in a more sustainable manner.

As of 2021, the Atlantide IT application has fully replaced the use of the traditional paper Loading and Unloading Register, making it possible to speed up and facilitate its completion and to standardise data collection for the Integrated Financial Statements. Data collection, monitoring and analysis are carried out on a monthly basis.

With the same frequency, data concerning waste produced by contractors on behalf of Italgas are collected, monitored and analysed; in addition, contractual clauses concerning waste management are updated in order to achieve recovery and reuse targets.

In 2022, waste from the Group's production activities amounted to 162.4 tonnes; the total value of waste sent for recovery or disposal for the same year amounted to 247.7 tonnes (value including inventories from 2021), 97.9% of which was non-hazardous. This type of waste is mainly made up of mechanical meters, which have been subject to a huge replacement campaign. 97.6% of the waste produced by the Group was managed for recovery.

In 2022, waste produced by contractors' activity on behalf of Italgas totalled 648,576.5 tonnes; through the growing engagement, 94.5% of waste produced by contractors was assigned for recovery. To further raise awareness, a web application was developed for the timely monitoring of the waste produced and to monitor the way in which it is managed, which has been in use since January 2023.

The same types of monitoring were extended to the Greek companies in order to ensure continuity of commitment; waste generated and reported by contractors to the companies was, for the last four months of 2022, 192,452 tonnes, managed 100% for recovery.

94. The waste management strategy is part of the Group's broader sustainability strategy, through specific KPIs of the Sustainable Value Creation Plan including a commitment to increase the percentage of the Group's and contractors' waste going to recovery.

Activities carried out on the reclamation sites in 2022

Italgas carries out environmental reclamation and redevelopment activities that include not only the remediation of environmental matrices related to the site, but also the removal of waste from past industrial activities and the possible demolition of plant structures and buildings.

Except in special cases, the sites to be reclaimed are former gas works, where industrial activities such as gas distillation from fossil carbon, cracking or reforming of light oil derivatives to produce the city's gas were carried out in the past.

During 2022, Italgas Reti continued to carry out design, safety, characterisation, monitoring, reclamation and environmental restoration activities on a total of 29 sites (forming part of those already identified in 2021), based on national environmental regulations for the reclamation of polluted sites, represented by Legislative Decree no. 152/06 "Environmental Standards", which superseded the previous legislative reference consisting of Ministerial Decree no. 471/99.

The sites in which an environmental procedure is operative in accordance with Italy's Legislative Decree no. 152/06 Part Four Title V "Reclamation of contaminated sites" are distributed throughout national territory and are geographically located as follows:

- 5 in Piedmont
- 8 in Liguria
- 8 in Veneto
- 1 in Tuscany
- 3 in Lazio
- 2 in Campania
- 1 in Molise
- 1 in Calabria

From an administrative point of view, only the "via Brin" site of Naples comes under the competence of the Ministry of the Environment and Energy Security (MASE), as it falls within the scope of the Site of National Interest (SNI) of Eastern Naples, whilst the remaining sites come under the competence of Regional or Municipal authorities.

According to the "state of business", the 29 sites can be grouped together into four clusters:

- 5 have active construction sites and operating groundwater pumping sites - *Venezia Mestre v. Altobello*, *Venezia Isola di Murano*, *Cairo Montenotte Parco 3*, *Lucca*, *Napoli v. Brin*;

- 7 have active safety or groundwater reclamation systems - *Turin C.so Regina Margherita University Area*, *Civitavecchia*, *Venice San Francesco IGR Area*, *Castellammare di Stabia*, *Ventimiglia*, *Venice Santa Marta*⁹⁵, *Campobasso*⁹⁶;
- 7 have completed operational sites and/or active monitoring - *Bassano del Grappa*, *Legnago*, *Sanremo*⁹⁷, *Turin v. Trofarello*, *Venice San Francesco Area ex Veritas*, *Cuneo*⁹⁸, *Turin Basse di Stura*;
- 10 are undergoing planning activities or are close to starting operations - *Cairo Montenotte Parchi 1 and 2*, *Cairo Montenotte Terreni C.so Stalingrado*, *Catanzaro*, *Chiavari Loc. Caperana*, *Ciampino*, *Este*, *Rapallo*, *Rome*, *Savona*, *Turin C.so Unione Sovietica*.

There are no reclamation activities taking place in Greece.

Industrial water

In 2018, with the update in 2020, Italgas carried out an environmental analysis which showed that the use of water resources is not a significant environmental aspect because it is mostly related to use for hygiene-sanitary or fire-fighting purposes. The Italgas production process does not involve the use of water for industrial purposes, with the exception of the quantities used to top up the gas preheating systems, inserted inside the cabins used to reduce the pressure of gas collected from the high pressure gas pipe system, without the presence of industrial drains. With specific reference to the management of the Medea distribution networks, the water used is heated to vaporise the LPG into a liquid phase when leaving the tanks. This water, which is also released into the fire-fighting system, is collected from the aqueduct or groundwater via wells. At the Sassari plant, the washing water is released to the ground, after treatment, in compliance with the authorisation.

For 2022, lastly, as part of the reclamation work, 191,277 cubic metres of water were taken from the contaminated groundwater; this was treated to take the concentrations of pollutants back to the limits permitted for discharge in public drains, in compliance with current legislation and authorisations.

Water for civil uses

The Group companies' environmental analyses, prepared in accordance with standard UNI EN ISO 14001, showed that use of water resources is not a significant environmental aspect. However, the safeguarding of resources and their rational use is envisaged by the HSEQ Policy and this is why the Group is committed to reducing limited water consumption. The withdrawal of fresh water from the aqueduct, used for hygiene/sanitary purposes in the changing rooms and offices and for the

95. As at 24/08/2022, active soil reclamation work was temporarily suspended following the overturning of a heavy vehicle used to transport soil for backfilling, while passing over the weighbridge at the site.

96. Non-automated Safety Interventions.

97. On 01/06/2022, the Provincial Administration of Imperia certified the reclamation of the former gasworks area located in via Goethe no. 171 - Sanremo (IM).


98. On 11/11/2022, the Province of Cuneo certified the completion of the Permanent Safety Measures.

fire-fighting system, came to 67,390 cubic metres (-11.4%): the reduction is mainly attributable to the closure of the changing rooms (and showers) at the operations offices and the greater use of smart working. As regard civil drains, most waste water is conveyed, considering its nature, to the drains without any treatment.

This differs for Italgas Acqua, the Group company that manages the distribution of water under concession in five municipalities of Campania. For this company, managing water consumption means collecting the water, making it suitable for drinking and distributing it to the city, guaranteeing quality standards and continuity and regularity of service.

Main Key Performance Indicators

Standard GRI 302-1 Energy consumption within the organisation

 Italy				
Energy consumed within the organization	u.m.	2020	2021	2022
FUEL ENERGY CONSUMPTION				
Fuel energy consumption from non-renewable sources				
Fuel energy consumption for civil and industrial use	TJ	368.0	366.0	275.0
of which natural gas for civil use	TJ	45.3	46.4	32.2
of which natural gas for industrial use	TJ	310.1	306.4	232.5
LPG and propane air for civil and industrial use	TJ	12.6	13.2	10.3
Fuel energy consumption for vehicles⁹⁹	TJ	123.0	137.2	111.5
of which diesel	TJ	11.0	12.1	4.3
of which petrol	TJ	18.1	16.2	32.1
of which natural gas	TJ	93.9 ¹⁰⁰	108.9	75.1
Fuel energy consumption from renewable sources				
Fuel energy consumption from renewable sources	TJ	0	0	0
Total fuel energy consumption				
Total fuel energy consumption	TJ	491.0	503.2	386.5
CONSUMPTION OF PURCHASED ENERGY				
Consumption of purchased energy from non-renewable sources				
Electricity	TJ	1.5	1.9	1.6
Heating energy	TJ	0.3	0.3	0.3
Consumption of purchased energy from renewable sources				
Consumption of purchased energy from renewable sources	TJ	99.3	91.8	83.6
Total consumption of purchased energy				
Total consumption of purchased energy	TJ	101.1	94.0	85.5
TOTAL ENERGY CONSUMED WITHIN THE ORGANISATION				
Total energy consumed within the organization	TJ	592.1	597.2	472.0

99. For more details on the trend of consumption linked to vehicles, refer to the specific graphs and the information given in the section "Emissions and action taken to reduce them" of this document.

100. The trend of energy consumption is consistent with the change

in the fuel mix used by the vehicle fleet. For more details on the trend of consumption linked to vehicles, refer to the specific graphs and the information given in the section "Emissions and action taken to reduce them" of this document.

Standard GRI 302-3 Energy intensity (Italy)

Below are some energy intensity values in respect of different reference parameters:

1. Energy intensity calculated by comparing the total Group energy consumption with the gas distributed.

Energy intensity	u.m.	2020	2021	2022
Global energy intensity	TJ/10 ⁶ Sm ³	0.07	0.06	0.06
Total energy consumed within the organization	TJ	592.1	597.2	472.0
Gas distributed	10 ⁶ Sm ³	8,477	8,887	7,961

2. Energy intensity calculated by comparing the Group's total energy consumption for gas distribution (excluding the activities of Italgas Acqua and Geoside), with the gas distributed. This parameter offers an indication of the quantity of energy used to supply 10⁶Sm³ of gas.

Energy intensity	u.m.	2020	2021	2022
Global energy intensity	TJ/10 ⁶ Sm ³	0.052	0.049	0.042
Total energy consumed within the organisation for gas distribution	TJ	441.2	433.3	338.0
Gas distributed	10 ⁶ Sm ³	8,477	8,887	7,961


3. Energy intensity calculated by comparing the Group's total energy consumption for gas distribution (excluding Italgas Acqua and Geoside activities), with the kilometres of network. This parameter offers an indication of the quantity of energy used to supply the service per km of network.

Energy intensity	u.m.	2020	2021	2022
Energy intensity per km of network	GJ/km	6.20	5.98	4.73
Total energy consumed within the organisation for gas distribution	GJ	441,200	433,300	338,000
km of network	km	71,185	72,503	71,481


4. Energy intensity calculated by comparing the Group's total energy consumption for gas distribution (excluding Italgas Acqua and Geoside activities) with the number of active re-delivery points. This parameter offers an indication of the quantity of energy used to supply the service per delivery point.

Energy intensity	u.m.	2020	2021	2022
Energy intensity per delivery point	GJ/unità	0.058	0.057	0.047
Total energy consumed within the organisation for gas distribution	GJ	441,200	433,300	338,000
Active delivery points	unità	7,595 · 10 ⁶	7,604 · 10 ⁶	7,213 · 10 ⁶


 Italy				
Water withdrawals	u.m.	2020	2021	2022
Quarry water, collected from quarries	MI	0	0	0
Sea water	MI	0	0	0
Rainwater collected	MI	0	0	0
Water withdrawn from the aqueduct (municipal drinking water)	MI	98.04	75.77	67.13
Surface water	MI	0	0	0
Underground water	MI	0.15	0.26	0.26
External waste water	MI	0	0	0
Total water withdrawn	MI	99.51	76.03	67.39

 Greece		
Water withdrawals	u.m.	2022
Quarry water, collected from quarries	MI	0
Sea water	MI	0
Rainwater collected	MI	0
Water withdrawn from the aqueduct (municipal drinking water)	MI	1.68
Surface water	MI	0
Underground water	MI	0
External waste water	MI	0
Total water withdrawn	MI	1.68

Standard GRI 303-4 Water discharge

 Italy				
Water discharge	u.m.	2020	2021	2022
Discharged in underground water ¹⁰¹	MI	1.40	0	0
Discharge to sewers	MI	98.01	74.19	66.53
Discharged in seawater	MI	0	0	0
Discharged in surface water	MI	0	1.56	0.48
Benefit/other use	MI	0	0.28	0
Sent to other treatment plants	MI	0.11	0	0.38
Total discharges	MI	99.51	76.03	67.39

101. Please note that water is drained in the soil after treatment.

 Greece		
Water discharge	u.m.	2022
Discharged in underground water ¹⁰²	MI	0
Discharge to sewers	MI	1.65
Discharged in seawater	MI	0
Discharged in surface water	MI	0
Benefit/other use	MI	0
Sent to other treatment plants	MI	0.03
Total discharges	MI	1.68


For the Italgas Group, the water drains correspond to the collections; consequently, water consumption is zero (GRI 303-5 Water consumption).

Standard GRI 305-1 Direct (Scope 1) GHG emissions


Standard GRI 305-2 Indirect (Scope 2) GHG emissions from energy consumption

GRI 305-3 Other indirect (Scope 3) GHG emissions

Standard GRI 305-4 Intensity of GHG emissions

 Italy					
Direct and indirect emissions and other GHG emissions (Italy)	GRI Standard	u.m.	2020	2021	2022
Total Scope 1	305-1	10 ³ t CO ₂ eq	173.1	160.5	141.0
Total Scope 2 ¹⁰³	305-2	10 ³ t CO ₂ eq	0.2	0.2	0.2
Total Scope 1 and Scope 2		10 ³ t CO ₂ eq	173.3	160.7	141.2
Total Scope 3 – supply chain	305-3	10 ³ t CO ₂ eq	183.3	147.2	137.5
Total Scope 1, Scope 2 and Scope 3		10 ³ t CO ₂ eq	356.6	307.9	278.7
Carbon intensity ¹⁰⁴	305-4	tCO ₂ eq/10 ⁶ Sm ³	20.4	18.1	17.7

GRI 305-7 Nitrogen oxides (NO_x), sulfur oxides (SO_x), and other significant air emissions (Italy)


 Italy				
Emissions	u.m.	2020	2021	2022
Civil	tNO _x	1.26	1.29	0.9
Industrial	tNO _x	17.28	16.41	12.46
Vehicles	tNO _x	3.11	3.36	1.98
Total	tNO _x	21.7	21.1	15.9

102. Please note that water is drained in the soil after treatment.


103. 2019: Scope 2 location-based, 2020 and 2021: Scope 2 market-based.

104. Calculated as Scope 1 and Scope 2 emissions / gas distributed.


Standard GRI 306-4 Waste not for disposal

 Italy							
Waste by type and disposal method	u.m.	2020		2021		2022	
		Hazardous	Non-hazardous	Hazardous	Non-hazardous	Hazardous	Non-hazardous
Recovery/Recycling	t	31.5	527.9	12.04	329.18	7.20	234.22
of which ferrous material	t	1.00	424.5	0.00	287.5	0.00	141.30
of which other material	t	30.5	103.4	12.04	41.69	7.20	92.92

Standard GRI 306-5 Waste for disposal

 Italy							
Waste by type and disposal method	u.m.	2020		2021		2022	
		Hazardous	Non-hazardous	Hazardous	Non-hazardous	Hazardous	Non-hazardous
Incineration	t	0	0.1	0	0.39	0.02	1.35
of which ferrous material	t	0	0	0	0	0	0
of which other material	t	0	0.1	0	0.39	0.02	1.35
Waste sent directly to landfill	t	0	0	0	0	0	0
of which ferrous material	t	0	0	0	0	0	0
of which other material	t	0	0	0	0	0	0
Other disposal plant	t	3.3	67	1.56	9.68	1.16	3.43
of which ferrous material	t	0.8	0	0	0	0	0
of which other material	t	2.45	67	1.56	9.68	1.16	3.43
Total	t	3.25	67.07	1.56	10.08	1.18	4.78

Standard GRI 306-3 Waste generated

 Italy				
Waste by type	u.m.	2020	2021	2022
Non-hazardous	t	526.7	318.4	159.0
Hazardous	t	45	16.07	3.4

Italy						
Main data on reclamation	2020		2021		2022	
	n	m ²	n	m ²	n	m ²
Sites involved by reclamation works or to be reclaimed	32	1,265,551	30	1,206,677	29	1,161,962
Certified reclamation works	0	0	0	0	2	10,659
Approved characterisation plans	28	1,208,348	26	1,143,810	26	1,143,810
Approved risk analysis (152/2006) or approved preliminary reclamation projects (pursuant to 471/99)	23	1,109,240	21	1,049,533	22	1,051,820
Approved operative reclamation projects (152/2006) or approved final reclamation projects (pursuant to 471/99)	19	1,094,760	18	1,036,482	20	1,041,161
Operative safety measures	1	257	1	257	1	257
Soil emergency safety measures	0	0	0	0	0	0
Groundwater safety measures	10	0	11	0	12	0

Biodiversity

Italgas mainly operates in the urban environment (from 'city gates' to meters): about 95% of our network's kilometres are installed in an urban or street context. Italgas also assumes the role of gas distributor: it is not a mining company and does not produce basic materials.

Through its policies, the Group is committed to assessing environmental protection issues and to the responsible management of the significant environmental impacts associated with its activities, pursuing the protection and care of the natural environment, avoiding deforestation, ensuring the restoration and maintaining the balance of the ecosystem and biodiversity, based on the principles of pollution prevention and emission reduction and in line with international standards, pursuing the sustainable management of natural resources and the efficient use of energy required to carry out its business activities. Finally, as the concession holder of the gas distribution service, and in line with the principles of sustainable development, Italgas operates by following the guidelines provided by the Municipalities through work authorisations. In particular, in activities involving excavations, Italgas complies with specific environmental requirements and carries out work to restore the prior ecological situation. At each stage of this process, Italgas employs qualified staff and organises training courses aimed at increasing awareness of environmental issues.

As far as Greek companies are concerned, the Group contributes to the preservation of local biodiversity through restoration and development projects of natural parks that are located within urban areas. In 2022, 8 green spaces were redeveloped in the urban areas of Thessaloniki, Larissa and Karditsa.