



# Innovation and digitalisation

[GRI 2-23, 3-3]

Iren Group, as declared in the Sustainability Policy, considers innovation as a strategic element to face future challenges and to meet the needs and expectations of its main stakeholders. The aim of the Group's approach to innovation is to improve service quality, building relationships between material infrastructures and human capital, both intellectual and social, thanks to the use of new technologies, in order to improve quality of life and meet the needs of residents, companies and institutions, also for the development of smart cities (» SEE PAGE 281). Through innovation, the Group strives for continuous improvement in managing potential environmental and social impacts in order to reduce risks and seize business opportunities.

## Innovation, digital transformation and smart cities



### Risks

- Failure to achieve the objectives and targets (economic-financial and ESG) set out in the Business Plan and consequent negative impacts (operating, economic, financial and reputational)
- Delay in technological change with effects on performance and competitive ability
- Loss of business opportunities



### Opportunities

- Accelerating digital transformation
- Business opportunities related to technological evolution in the field of green transition (e.g. electric mobility)
- Partnerships with innovative start-ups, universities and research centres
- Participation in territorial systems for smart cities
- Reducing environmental impacts on the local area



### Management methods

- Planning and monitoring of business plan objectives and targets (economic/financial and ESG)
- Code of Ethics
- Sustainability Policy
- Group innovation plan and related investments
- Iren UP Cleantech Venture programme
- Iren Innovation Lab to drive internal open innovation initiatives

## Iren innovation model

Innovation in Iren Group is central to the strategic choices and the definition of the products and services offered. The Business Plan to 2030 includes significant investments in new technologies and digitalisation, in the development of all operating sectors, with the aim of making the Group an example of excellence in the sector. In line with the pillars on which the Business Plan is based - decarbonization, circular economy, safeguarding of water resources and resilient cities - the main innovation actions undertaken by the Group are aimed at **researching and adopting technologies and processes to support the sustainable development** of its reference businesses.

Iren Group manages innovation processes through an **open innovation** model and, consistently, has launched profitable collaborations with Universities, Research Centres, Innovation Hubs and Start-ups. It also actively participates in working groups and associations on specific research and development topics and promotes events such as conferences, workshops and hackathons, recognising the importance of stakeholder involvement and participation in innovation processes.

The Group's **first Call4Ideas**, which started in 2022, was concluded in 2023 and started in 2022. The initiative involved 86 colleagues who, divided into 20 teams, dedicated time and resources to the development of their projects, with the training support of coaches and mentors. In January 2023, an initial event was held in which with the 8 finalist groups were selected which, on 5 April, presented their work to a jury composed of the Group's top management during the first **Iren Innovation Day**. At the end of the event, held in Turin at the Museo Nazionale del Risorgimento, prizes were awarded to the four best projects that continued development work over the following months. The winners also participated in an educational prize trip to continue developing skills for the development of innovative projects. Following the success of the first edition, the second edition of Call4Ideas was launched in October 2023, to once again give all employees the opportunity to submit their innovation ideas to strengthen the Group's positioning, launch new businesses and improve existing processes or ways of working. The initiative collected 130 spontaneous applications from which the 15 most relevant to the objectives of Call4Ideas were selected. The selected ideas, as in the previous edition, embarked on a development and pre-acceleration programme that will continue throughout 2024.

In July 2023, **Iren Innovation Lab** organised and held the first corporate event, entirely dedicated to artificial intelligence and its applications, which involved more than 80 colleagues in a training and project-building opportunity. Thanks to the intervention of start-ups and industry experts, the event enabled participants to gain a comprehensive overview of the importance of artificial intelligence, its impacts and benefits. It was also an opportunity to share real use cases and projects that Iren Group has already initiated started. The final part of the day was dedicated to working tables, where participants were engaged in understanding the potential benefits and challenges associated with the development of the technologies presented, as well as identifying possible areas for action.

Internal initiatives also include the completion of the development of the **platform supporting open innovation**, which can be accessed to collect innovation challenges and projects, and the **innovation newsletter**, which reaches more than 500 company managers with updates on the main trends of their interest. The platform was also used for the new edition of the Iren ESG Challenge Prize, aimed at the 10 best theses on sustainability issues and ESG challenges, receiving nominations from around 140 undergraduate and doctoral theses ([» SEE PAGE 128](#)).

On the **external initiatives** front, the collaboration continued with Wazoku, the largest crowdsourcing innovation platform, made up of over 600 thousand innovators (students, researchers, technology experts and enthusiasts, scientists, startups and SMEs) ready to accept the challenges launched from the most important global companies. In the context of the collaboration, the Group has launched challenges, defined in collaboration with the Business Units, which are associated with a cash prize that is paid only to those who are able to propose a solution deemed valid and significant.

2023 was also characterised by the continuation of technical activities related to the Group's various co-financed projects and by the development, in partnership with innovative companies and Start-ups, of internal technological projects on the basis of planning which, starting from an analysis of the long-term scenario, is aimed at giving the Group the tools needed to seize the opportunities and mitigate the risks deriving from the evolution of the markets in which it operates.

The activities of **Iren Up, the Corporate Venture Capital programme**, launched in 2018 with the aim of supporting the highest potential Italian start-ups in the cleantech sector, from clean technologies to the circular economy, continued. The programme provides for direct and indirect investments with different tickets depending on the life phase of the start-up and needs. In line with the Business Plan, the start-up support programme has been enhanced by the collaboration with CDP Venture Capital Sgr; in particular, since 2022, Iren has been a Limited Partner of Tech4Planet, the National Technological Hub dedicated to sustainability, Tech4Planet. Through this investment, the Group actively participated in the definition of the investments by contributing to the business and technical analysis of the proposed dossiers; the fund currently has 21 investments in its portfolio as lead and co-investor. As far as direct investments are concerned, the start-up Re Mat, active in polyurethane recycling, was acquired in 2023; an operation that allows the Group to vertically integrate the recycling chain on this specific material.

The 2022/2023 edition of the **Iren Startup Award** - the competition devised by the Group to support the development of start-ups with the highest innovation potential - was promoted in collaboration with Circular Economy Lab (a project of Intesa Sanpaolo Innovation Centre) and Cariplo Factory and was dedicated to cleantech innovation for the circular economy ("Call4Circular - Circular products and materials"). After the scouting phase of the applications received, suitable projects were selected for the development of use cases in cooperation with the Group. In April 2023, on the occasion of during the first edition of Iren Innovation Day, the final of the competition was held with the awarding of prizes to the winning start-ups in the scale-up and seed categories. This was followed by an in-depth study aimed at evaluating the testing of both technologies. Scouting activities continued also through collaboration with local and international accelerators, trade associations and investment funds.

As part of its **networking activities and participation in the external innovation ecosystem**, Iren has taken part in initiatives such as SMAU, Elis, Startup Intelligence and Business Process Automation Observatory of the Milan Polytechnic, the House of Emerging Technologies, acceleration programmes (Techstars and Digital Magics) and regional competitions dedicated to start-ups in Emilia-Romagna and Liguria. The Group also sponsored the National Innovation Award (PNI), participating in the jury and awarding the winner of the Cleantech category. Among the initiatives in which Iren has participated, bringing its contribution in terms of

process innovation and applied research, there are also the collaborations with the Competence Centres (promoted by the Ministries of Economic Development and Economy) in Turin and Genoa.

Also in 2023, Iren received the **Smau Innovation Award** for Iren4Planet, a new service that allows customers to calculate their environmental impact based on consumption, spending habits and behaviour, and to receive suggestions to reduce their carbon footprint, created in partnership with the start-up AWorld.

## RESEARCH AND INNOVATION PROJECTS

In 2023, Iren Group actively took part in 18 research and innovation projects for a total multi-year commitment of around 4.9 million Euro, of which more than half was financed by research and innovation tenders managed by institutions such as the European Union, the Italian State and its bodies and Regions (for example, Horizon 2020, Horizon Europe, MUR, POR FESR, etc.). Over the year these projects involved investments of around 725,000 Euro, of which approximately 506,000 Euro was funded through tenders. These projects actively involve around 80 Group employees from different business areas, and guarantee collaborations with numerous businesses and academic institutions located in over 100 European cities. All research projects are aimed at sustainable development and work on actions in line with the Group's objectives, including, for example: studies of tools and technologies to support the decarbonization of energy production and district heating networks, solutions for CO<sub>2</sub> capture, hydrogen-fuelled technologies, development of electric vehicle charging infrastructures, circular economy, flexibility analysis and demand-side management also in relation to the issue of energy communities. The evaluation of impacts and the monitoring of results are fundamental elements of the funded project and constitute one of the contents of the reporting of each individual project. In the medium- and long- term, the Group continues its monitoring and evaluation activities in order to increase the effectiveness of the design results.

Below are the main projects in which the Group participated in 2023.

## Project

## Description

### Prelude

(European Horizon 2020 programme)

Testing of innovative solutions in building and plant management, maximising the interaction with users to optimise consumption. Iren Group, under the co-ordination of Iren Smart Solutions, is in charge of the development of the Italian pilot, which focuses on a residential building in Turin and, in particular, on 8 flats that have been equipped with different levels of sensing, and direct feedback on the inhabitants (via app or similar).

### CaLby2030

(European programme Horizon Europe)

Demonstration of CO<sub>2</sub> capture systems based on Calcium Looping (CaL) circulating fluidised bed, starting with three pilot plants in Europe operating under industrially relevant conditions and projecting this technology towards large-scale commercial implementation in major high-emission sectors by 2030 (target sectors: steel, cement, WtE).

### FlexCHESS

(European programme Horizon Europe)

Study of the integration of demand flexibility sources within electricity grids characterised by intermittent and unpredictable sources such as renewables. The project investigates the use of different combinations of energy storage systems (e.g. batteries, electric vehicles, flexible loads) for balancing networks at both local and systemic levels. Iren Group is engaged in the development of the Italian pilot in Turin, in cooperation with Algowatt and UNIGE, with the aim of studying the potential of a virtual energy storage system.

### CHESTER

(European Horizon 2020 programme)

Development and integration of an innovative Power-to-Heat-to-Power solution to maximise the exploitation of non-programmable electricity Renewable Energy Sources and thermal renewables already combined with district heating systems. The system was the subject of an in-depth technical-economic and market potential analysis. The project was concluded in March 2023.

### RES-DHC

(European Horizon 2020 programme)

Development of support tools for regulators and stakeholders for the increase of renewables in district heating and cooling systems, including programmatic and technical-economic assessment tools, actions to improve policy and regulatory frameworks, innovative dissemination and communication means in six European pilot areas. The project, which ended in August 2023, involved consortia of national stakeholders through regular meetings.

### Marilia

(European Horizon 2020 programme)

Development of a new low-cost, high-sensitivity, expeditious test for detecting pathogens in water samples, potentially applicable in other sectors such as food, healthcare, and agriculture. The goal is to validate the test – developed to identify a set of bacteria laying the foundations for a subsequent deployment in the field – in the laboratory, with a significant efficiency in speed and cost compared to current analytical practices. The detection procedure analysed at the Iren laboratories in Genoa involved the use of a LAMP (loop-mediated isothermal amplification) molecular reaction protocol with specific bacterial targets corresponding to E.coli, chosen as a model strain for the validation experiment. The project was concluded in February 2023.

### Woodcircles

(European programme Horizon Europe)

Study and demonstration of solutions to enable the recycling and reuse of wood waste from construction and demolition activities. The project, which started in June 2023, involves Iren Group in the Italian pilot - in collaboration with the City of Turin and Environment Park - for the collection, at public building renovation sites in Turin, of wood material, which will then be sent to the Pallet plant in Vercelli to be used to make simple street furniture elements.

## Project

## Description

**Everywh2ere**

(European Horizon 2020 programme)

Development of gensets with hydrogen-fuelled, easy-to-transport fuel cells for temporary power supply in various sectors. Concluded in December 2023, the project allowed the demonstration of the generator's operation at temporary events and, in the preparatory stages of demo sites, at events identified by Iren in its territories, to highlight the current barriers to its installation and use, and future commercial development.

**INCIT-EV**

(European Horizon 2020 programme)

Development and on-site testing of a set of electric vehicle charging infrastructure, hardware and software technologies and business models to promote large-scale adoption of electric mobility. The Group is actively collaborating in the development of the test area in Turin, at an interchange car park. Work on the management of the administrative and fiscal aspects of the new network utilisation mode is ongoing.

**5G-Solutions**

(European programme Horizon 2020)

Experimentation – in different on-site, functionalities, potentialities and limits tests – of the 5G network, participating in the activities of the “Energy” vertical in the evaluation of the benefits related to the integration and use of the 5G network for the Demand Side Management at the level of regulation of thermal loads and the recharge of electrical vehicles. As part of the project, which ended in January 2023, the Group dealt with Italian pilots regarding the management of a heat pump central heating system and the charging of electric vehicles.

**Data Cellar**

(European programme Horizon Europe)

Development of a platform (data space) capable of collecting data from different sources operating in the energy community sector, in order to enable new business models related to data interchange. Iren is in charge of providing the use cases of the Italian pilot represented by two energy communities, one in a rural and one in an urban environment.

**OnlyPlastic**

(RFCS – 2019)

Substitution of fossil carbon sources (coal, coke, petroleum coke) in the electric arc furnaces of a steel plant in northern Italy with densified polymers derived from residues from the treatment of plastic waste. The pilot project was concluded in August 2023.

**PolynSPIRE**

(European programme Horizon 2020)

Demonstration of a range of sustainable, innovative and cost-effective solutions for the energy and material recovery of post-consumer plastics and industrial waste. The project was concluded in March 2023.

**MULTIPLIERS**

(European Horizon 2020 programme)

Facilitation of the introduction of new scientific ideas, practices and approaches in schools, which can offer to the communities a space for open innovation on scientific issues that have an impact on citizens' lives. Multi-player partnerships (Open Science Communities) were established at three school institutes in the province of Reggio Emilia. Italian educational experiments are coordinated and implemented by Eduiren on the topics of water, circular economy and efficient energy use and production.

**RUN**

(POR-FESR 2020 Liguria Region)

Development and demonstration of a now-casting service of the risk of flooding in urban areas in the presence of heavy rainfall, using IoT technologies and big data analysis tools, designed for smart cities and urban drainage network managers, allowing faster actions to protect people, and properties and those in charge of the maintenance of the drains, who will be able to plan interventions for optimal operation of the system. The user interface developed allows for the display of danger levels, 'weighted' according to the degree of flooding in the area considered and the degree of obstruction of the drains present. The project ended in March 2023 and the project results made it possible to propose an important follow-up for the Rain4Utilities project, which will be financed and implemented under the POR FESR 2021-2027 tender.

## PNRR-CO-FOUNDED PROJECTS

Iren is involved in PNRR projects related to “Partnerships extended to universities, research centres and companies”. In particular, Iren - which as a private partner can steer and benefit from the lines of research and projects developed by academic and research partners - is a partner in two projects:

- *NEST - Network 4 Energy Sustainable Transition*, coordinated by the Bari Polytechnic University. Iren is involved in two lines of research: the hydrogen value chain and energy storage (with also a focus on heat storage connected to the district heating network), with particular attention to the technical and technological development of innovative solutions and regulatory analyses and market;
- *RETURN - multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate*, coordinated by the University of Naples Federico II. Iren participates in research activities in the context of modelling weather-climatic phenomena in order to evaluate their impact on the assets and activities managed by the Group.

Furthermore, as part of the cascading calls of the NODES (North West Digital and Sustainable) programme, financed by the MUR under PNRR, Iren presented, together with a startup, the BRIDES (Boosting Resilience through Innovative Decentralised Energy Storage for sustainable mobility) project, which started in December 2023, and aims to develop a portable, high-capacity, high-power charging system, implemented with Vehicle-to-Grid (V2G) functionality, reusing second-life vehicle batteries to create a decentralised energy storage solution serving energy communities and ancillary energy markets to maximise self-consumption of renewable energy and meet grid flexibility demands.

## AMGA FOUNDATION

The AMGA Foundation was established in 2003 with the aim of promoting and organising scientific, educational and cultural initiatives for protecting the environment and water resources and the optimal management of network services.

In particular, it looks to increase and disseminate knowledge and understanding about the water cycle and its interactions with the environment, within research and training projects orientated at allowing sustainable management of water resources and promoting economic growth and development of the local areas in which it operates.

Furthermore, it is committed to research activities on organisational models of water services and, more generally, public services, in order to assess the possible

management options within the various regional scenarios. The skills acquired are made available by the organisation of training courses and seminars and the publication of technical and educational volumes.

The Foundation's scientific results from projects and collaborations are a valid reference in water resources, energy and environmental management. In 2023, Amga undertook such activities by coordinating research projects and promoting wide-ranging cultural and educational activities.

The Foundation also manages the thematic library on water and the Water and Gas Museum of Genoa. A summary of the activities realised by the Foundation in 2023 is provided below.

## RESEARCH PROJECTS

## Project

## Description

MYRAEE  
(MYco Recovery of  
Electrical and Electronic  
Equipment)

Carried out in collaboration with the Department of Chemistry and Industrial Chemistry of the University of Genoa, the project tested new fungal strains capable of selectively absorbing precious metals and/or rare earths from WEEE. Research has identified suitable treatments and working conditions in relation to the waste treated and how the final product is recovered. A scale-up feasibility study of the process was also carried out.

Manganese oxide  
nanocatalysts for  
sustainable energy  
production (Mn4Energy)

The project was promoted by the National Interuniversity Consortium for Materials Science and Technology. The research was conducted with the aim of developing a library of manganese oxide (MnOx) catalysts that could be used for clean energy production by splitting water molecules into hydrogen and oxygen and reducing CO<sub>2</sub> emissions.

Comparative evaluation  
of biogas cleaning and  
upgrading processes

The objective of the project, conducted by the Department of Chemistry and Industrial Chemistry of the University of Genoa, was to provide stakeholders (operators of industrial processes that produce biogas for refining and utilisation, operators of waste treatment plants or wastewater treatment plants) with useful tools for the design, operation or revamping of plants. The planned activities include the study of the processes used for the production of biogas, the critical analysis of the processes currently existing and usable for biogas cleaning, the identification of the supply chain that can be used for each specific case, considering the operational parameters of the production process of biogas and the planned end use of the product.

Markets in search of  
regulation - an empirical  
analysis of natural gas  
distribution

The regulation of gas distribution provides for the awarding of concessions by tender. In Italy, between 2006 and 2010, the expiry of several concessions and the conditions laid down in the sector regulations led to the announcement of around 160 tenders based on the offer of the maximum concession fee for the benefit of municipalities. The research, promoted by the Department of Management Engineering of the Polytechnic of Milan and the Department of Economics and Business Sciences of the University of Pavia, aims at analysing the literature on multi-unit auctions and economies of scale in gas distribution in order to estimate a distribution cost function and then rank the companies participating in a tender on this function, to assess the amount of savings that can be achieved.

Optimal management  
methods for urban  
drainage systems based  
on innovative rainfall  
monitoring by means of  
IoT low-power wide-  
area network technology

The project, carried out in collaboration between the Department of Civil, Chemical and Environmental Engineering of the University of Genoa and Artys, proposes the study and testing of a new tool for more efficient management of the sewer network during intense weather events. It foresees the development and application in the area of the centre of Genoa of advanced methodologies for the elaboration of rainfall intensity maps updated in real time. The research results can provide the managing entity with a system that can be replicated in different contexts and refined based on the design data of the monitored sewer networks.

## RESEARCH PROJECTS

## Project

## Description

The economic, environmental and organisational performance of the Italian water sector

The project, carried out in collaboration with the Department of Economics and Business Studies of the University of Eastern Piedmont and the National Research Council - Institute for Research on Sustainable Economic Growth, focuses on measuring the performance of water service operators in order to assess, through a combination of different techniques, the impact of aggregations between companies in their integrated performance, evaluated in economic and environmental terms. The efficiency measures will then be used in a second-stage analysis to check the impact of certain external and/or environmental aspects or aspects related to the companies' own characteristics and management.

Reuse of purified effluents: analysis of the hygienic-sanitary impact

The project, carried out in collaboration with the Department of Public Health and Paediatric Sciences of the University of Turin, proposes monitoring the hygienic-sanitary quality of effluents exiting from different wastewater treatment plants, with particular focus on microbiological and ecotoxicological characteristics. Wastewater treatment plants equipped with disinfection treatments are studied with the aim of possible reuse of the effluent produced for agronomic/industrial purposes. It also involves the evaluation of the hygienic-sanitary impact of the wastewater from the treatment plants on the receiving water bodies (surface and/or marine waters).

The dynamics of retail energy prices and the transition to the free market

The project analyses, with appropriate statistical and econometric tools, the dynamics of retail prices in the free electricity and gas market in the period 2019-2023, using the figures provided by the comparison engine made available to users by ARERA, with the aim of providing useful information for the customer and stakeholders, also from a forecasting perspective.

Guidelines for the Third Sector for the efficient use of water and energy resources

The experimental study of guidelines has the value of a concrete tool to support Third Sector Entities (ETS) and Religious Entities (ER) in order to: develop awareness with respect to direct water consumption, increase the capacity to use water resources efficiently and effectively, improving the water footprint, improve water expenditure through better consumption, acquire awareness also with respect to the main indirect water consumption related to their own areas of activity. The activity, developed together with ENEA, will lead to a new edition of the Energy Guidelines addressed to Italian ETS and ER, with a regulatory and operational update on energy sustainability issues. The study is the follow up of a first draft of the Guidelines - already developed in collaboration with Fratello Sole Energie Solidali, ENEA and Buildtech - which included a sector overview with focus points on energy and water and indications for carrying out consumption analyses, organising an efficiency action plan and identifying tools to finance structural interventions.

Doctorate in European Sustainability Studies

Signing of two agreements with the University of Genoa to carry out and develop specific lines of research on: (i) European policies and local measures for land and industrial development: the role of local authorities in comparative perspective and (ii) sustainable development, environment and energy transition.



## CULTURAL AND EDUCATIONAL PROJECTS

### Project

### Description

#### Telling the story of wastewater treatment

The project involves the creation of signage designed to communicate and inform at several levels not only about wastewater treatment technologies and processes, but also about environmental content and the positive impact of the processes on receiving water bodies. The signs will be placed in the area of the Camisano wastewater treatment plant, near Lerici.

#### The Song of the Tree - video trailer:

A musical to raise awareness among children and families about climate change and environmental protection efforts.

#### Summer school renewable energy communities

Participants in the summer school, promoted by the Department of Political and International Sciences of the University of Genoa with the support of the AMGA Foundation, benefited from advanced training on the objectives and challenges of the green transition and in particular explored tools and models for the energy transition, with a focus on renewable energy communities.

#### Eco-show booklets

Booklets were printed for three shows staged in previous years - "The Song of the Tree", "A Sea without Plastic" and "Space Poos" - with in-depth examinations of the topics addressed, which will be proposed at the performances and as part of specific educational projects.

#### Maxi crossword environment and sustainability

Two maxi crosswords were designed to raise awareness of proper waste management and sustainability issues. The crossword puzzle definitions are designed for a target group of children and families.

#### Restoration of the plastic model of the Gorzente lakes and the Isoverde plant:

Restoration of the plastic model, and its wooden support, of the Gorzente lakes area, whose water is treated in the Isoverde (GE) drinking water plant. The first hydroelectric power station in Italy and the first in the world to transmit direct current energy for industrial use was built in the area.

In 2023, the projects, financed by the AMGA Foundation, took shape as part of the Project 4.0 Tender aimed at subsidising projects in the water, environmental, energy and regulatory fields:

- experimentation, at laboratory scale, of a two-stage treatment of OFMSW (Organic Fraction Municipal Solid Waste) and excess sludge with the production of volatile fatty acids (VFA) and biogas that can be used to optimise the process of biological removal of nutrients from urban wastewater;
- characterisation and automatic sorting of electronic boards using intelligence and computer vision algorithms for use in waste electrical and electronic equipment (WEEE) disposal plants;
- design, realisation and testing of innovative solutions for the resilience of water and energy networks to develop technologies for the energy autonomy of monitoring stations of infrastructures that transport fluids (natural gas and biogas, hydrocarbons, water);
- measurement of the technical efficiency of companies managing water and/or gas distribution in Italy.

## Digitalisation

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Digitalisation is among the enabling levers that allow the Group to grow in line with the objectives of the Business Plan to 2030, which envisages a significant increase in investments to support the Group's digital transformation and development process. In particular, investments will be dedicated to **technological initiatives** to:

- raise levels of cybersecurity;
- consolidate the transition to a data-driven approach by adopting a new organisational model that supports processes and effective data management;
- improve the business continuity strategy, through the implementation of new data centre solutions, architecture and application evolution, in order to further improve resilience, reliability and performance.

Technological initiatives join **functional initiatives** to:

- enable businesses through digital transformation programmes, use of sensors, IoT platforms, wearable devices, predictive maintenance, and creation of customisation programmes for customer offerings;
- digitalise processes through management software, systems for digitalising customer transactions, and integration of digital identity and electronic signature systems.

A number of actions in these areas to improve operational efficiency were realised in 2023:

- upgrade to a new version of the SAP TM module in order to upgrade the corporate time recording world to S4HANA technology;
- adoption of the Pick&Go system on all the Group's warehouses for which this functionality was envisaged, following the introduction of a new warehouse management system for the management of all warehouses. Business intelligence and predictive analysis capabilities for optimised warehouse management were also made available;
- launch of the **new corporate intranet** now user-friendly on all devices, mobile or fixed, and with a focus on usability and communication issues;

- completion of the analytics project on prescriptive/predictive maintenance of low- and medium-voltage electricity grids;
- release of the new IrenAmbiente app;
- implementation of a single solution for the management and operation of the Waste Management BU plants (InPlant project);
- release of new applications in the fields of artificial intelligence, data and digital.

In continuity with the digital transformation programme undertaken by the Group and with the aim of evolving the current application ecosystem to optimise digital marketing and sales strategies, to ensure synergy between all channels, improve the customer experience, the following projects were developed:

- *website and digital commerce* - new commercial portal irenlucegas.it with new e-commerce for the sale of non-commodity products and enabling customised contextual experience;
- *martech & digital marketing* - boosting sales of the Group's products and services through digital marketing services and advanced martech tools that enable a new personalised user experience;
- *agent portal* - new solution for sales agents.

In the field of **telecommunications**, as in previous years, the growth in the use of bandwidth for internet connections is confirmed and in particular, towards the main cloud providers. In 2023, tools for monitoring traffic and malfunctions were consolidated, and new systems were introduced to support IT security. In addition, the wholesale module to provide FTTC (fibre to the cabinet) and FTTH (fibre to the home) services was successfully tested.

## CYBERSECURITY

Cyber risks are defined as the set of internal and external threats which can compromise business continuity or cause civil liability damage to third parties in the event of loss or disclosure of sensitive data. The operational risks regarding information technology are closely related to the business of Iren Group, which operates network infrastructures and plants, including through remote control, accounting operational management and invoicing systems, in addition to the energy commodity trading platforms. To mitigate such risks, specific measures have been adopted, such as redundancies, highly-reliable systems and appropriate emergency procedures, which are periodically subject to simulations, to ensure their effectiveness.

In particular, in the event of incidents or suspected cybersecurity events, the Group employees are required to follow the operational guidelines, posted on the corporate intranet (specific section dedicated to cybersecurity), to report to the competent corporate structure and adopt the appropriate rules of conduct.

In the event of IT security emergencies, the Group has implemented a Business Continuity Management model [» SEE PAGE 59](#), equipping itself with the organisational and technological safeguards to ensure the continuity of processes and a proactive and structured response in the management and monitoring phases to emergency events.

Iren Group is also exposed to the risk of cyber attacks aimed at acquiring sensitive data and at stopping operations, causing damage to plants and networks and compromising service continuity. Market analyses show that attacks aimed at acquiring companies' and third-party data are increasingly frequent, with consequent civil liability and sanctions, including serious ones, and at acquiring industrial secrets. In this regard, the following actions were implemented:

- adoption of a Cyber Threat Intelligence (CTI) platform, in order to effectively and efficiently manage all information related to potential cyber threats;

- extension of Threat Intelligence analysis to third parties;
- adoption of a platform for monitoring the security configurations of network equipment;
- introduction of a web application firewall for the timely protection of published applications;
- implementation of virtual patching to increase protection for end-of-support servers that currently cannot be decommissioned;
- migration of the company's mobile device management system for smartphones and tablets to the new cloud solution;
- implementation of double factor authentication for connections via corporate VPN (virtual private network);
- introduction of a system (network access control) to control access to equipment in electricity distribution stations;
- the initiative to increase IT security took place in the OT world during the year;
- adoption of systems with behavioural analysis capabilities and the execution of automated and remote responses for workstations;
- continuation of the multi-year awareness project on IT security issues, aimed at all Group employees, based on phishing simulation campaigns, assessment questionnaires and targeted online training modules;
- security audits of IT suppliers, aimed at verifying the effective adoption of the minimum security measures required in the contractual phase;
- implementation of a platform for monitoring the security configurations of network equipment;
- continuous operation of the Security Operation Centre with 24-hour monitoring of IT security events.

The Group Cyber Risk Policy provides - similarly to the other main risk policies - the convening of the specific Risk Commissions, the monitoring of performance indicators and the production of dedicated reports ([» SEE PAGE 57](#)).