



Energy efficiency and renewable production

[GRI 2-6, 2-23, 3-3, 302-2, 302-4, 302-5, G4-EU1, G4-EU2]

Iren Group has defined important objectives in its development plan to produce 'green' energy and save natural resources, particularly energy resources, is committed to ensuring high levels of energy efficiency in the management of its activities and offers energy efficiency solutions to customers. Choices that contribute not only to reducing environmental impacts, but also to mitigating the economic impact on communities in terms of costs for energy commodities.

Energy efficiency and renewable production to reduce environmental and economic impacts



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)
- Impacts inconsistent with directives and guidelines on energy efficiency and production from renewable sources, resulting in negative economic and reputational impacts
- Shortage of water resources affecting hydropower generation
- Reduction in demand for district heating caused by the rise in average temperatures
- Chronic or extreme natural phenomena from climate change that may cause impacts on assets/performance
- Changes in the legislative/regulatory framework regarding incentives for energy efficiency measures



Opportunities

- Growth in renewable production contributing to the green transition
- Independence from fossil resources
- Growth in services dedicated to energy efficiency and self-production for communities/customers
- Extendability of district heating systems in new geographical areas



Management methods

- Planning and monitoring of business plan objectives and targets (economic/financial and ESG)
- Sustainability Policy
- Sustainable Financing Framework
- MbO and LTI system with ESG objectives
- ERM system (Operational Risk Policy and Climate Change Risk Policy)
- Construction/acquisition of new renewable plants
- Development of a portfolio of energy efficiency services/products for customers and communities
- Integrated Certified Management System (risk assessment, containment measures and third-party audits)
- EMAS Certification
- Procedures: Environmental analysis; Execution of energy refurbishment of buildings; Management of energy resources
- Temperature monitoring
- Adoption of best available technologies
- Maintenance plans, including predictive plans
- Energy manager
- Energy diagnosis
- Monitoring and studying energy consumption

Energy production

**9,067
GWh**
of electricity
production

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

In 2023, Iren Group produced 9,067 GWh of electricity, more than 73% from renewable sources (water, solar, wind, biomass or waste) and high-efficiency co-generation.

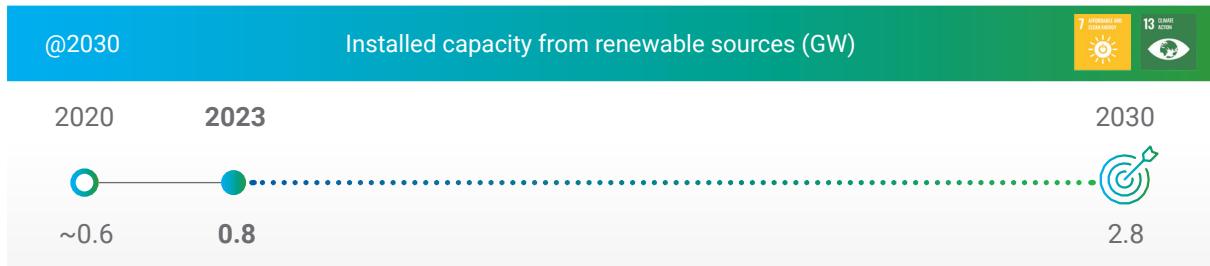
| Net energy output | Installed power (MW) | 2023 | 2022 | 2021 | 2020 |
|---------------------------------------|----------------------|--------------------------------|--------------|--------------|---------------|
| | | Electricity production (GUJhe) | | | |
| Hydroelectric plants | 622 | 1,120 | 793 | 1,239 | 1,295 |
| Photovoltaic plants | 189 | 214 | 207 | 21 | 21 |
| Wind plants | 6 | 9 | 0 | 0 | 0 |
| Thermoelectric plants | 1,219 | 2,425 | 1,658 | 2,337 | 2,706 |
| Cogeneration plants ⁽¹⁾ | 1,263 | 4,684 | 4,955 | 5,611 | 5,454 |
| Waste-to-energy plants ⁽¹⁾ | 95 | 577 | 605 | 578 | 598 |
| Landfills | 16 | 32 | 27 | 31 | 29 |
| Biogas plants | 1 | 4 | 5 | 5 | 7 |
| Other renewables | 1 | 2 | 2 | 1 | 0 |
| TOTAL | 3,411 | 9,067 | 8,252 | 9,823 | 10,110 |

| Net energy output | Installed power (MW) | 2023 | 2022 | 2021 | 2020 |
|------------------------|----------------------|-----------------------------------|--------------|--------------|--------------|
| | | Thermal energy production (GUJht) | | | |
| Cogeneration plants | 874 | 2,006 | 2,135 | 2,564 | 2,230 |
| Boilers | 1,516 | 342 | 434 | 480 | 533 |
| Waste-to-energy plants | 191 | 291 | 301 | 285 | 180 |
| Biomass | 0.4 | 0 | 0.3 | 0.3 | 0.3 |
| TOTAL | 2,581 | 2,639 | 2,870 | 3,329 | 2,943 |

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

The objectives of the Business Plan to 2030 provide for an increase in installed capacity from renewable sources in order to reach a total of 3.4 GW. For the development of photovoltaic and wind power plants, the Group's strategy is primarily oriented towards realising and, on a residual basis, acquiring new plants to benefit the decarbonization and energy independence of the country system as well. In 2023, following the inauguration of two major **photovoltaic parks** in Basilicata and Lazio, the Group reached approximately 189 MW of total installed photovoltaic power. In addition, plants with an additional 69 MW of installed capacity are under construction and numerous other projects, totalling more than 1 GW, are in the development and authorisation phase. These plants are located in different Italian regions, with a particular focus on the Group's local areas. In 2023, the Group acquired its first **wind farm**, located in Liguria, which is already in operation, with an installed capacity of 6 MW, and for which authorisation

procedures are underway for an increase to 7 MW of capacity. To increase the installed power of the **hydroelectric plants**, the projects for the reactivation of the Noasca (TO) and Giffoni (SA) plants and the installation of the generator group of the San Mauro crossroads on the Po River (TO) continued in 2023, with the related upstream ladder for the ichthyofauna. In addition, the final design for the authorisation of a hydroelectric plant, in the Turin area, using the head of the existing Michelotti canal crossing at the Po River in Turin, with associated upstream ladder for ichthyofauna, was completed.



ELECTRICAL STORAGE FOR THE ENERGY TRANSITION

The Group's Strategic Plan envisages the installation of about 300 MW of electrical storage by 2030 to support the development of renewable energy sources for the energy transition, in line with national strategies, and to provide support services for the stability of the national transmission grid for the transition to a zero-emission electricity system.

To materialise this strategic orientation, two electricity storage systems that can store up to 20 MWh of energy were built and commissioned in 2023 at the Turbigo (MI) and Moncalieri (TO) power plants. Accumulators make both the generation units installed in power plants and the national transmission grid more flexible, as they are able to cope with the natural intermittency of renewable sources. Other electricity storage systems are being studied and will be implemented in the coming years in line with the Group's strategy and the emerging opportunities in the electricity market.

Energy savings in processes

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

The total energy savings generated by the Group in 2023 stood at about 769,000 TOE (equal to about 32 million GJ), up 10% compared to 2022, with contributions from various areas of operation.

| Energy savings in processes ⁽¹⁾ (TOE/000) | 2023 | 2022 | 2021 | 2020 |
|--|------------|------------|------------|------------|
| Energy production plants | | | | |
| Cogenerators and boilers ⁽²⁾ | 207 | 208 | 238 | 223 |
| Hydroelectric ⁽³⁾ | 194 | 138 | 215 | 225 |
| Waste-to-energy plants ⁽⁴⁾ | 60 | 63 | 60 | 60 |
| Thermoelectric ⁽²⁾ | 32 | 28 | 31 | 30 |
| Landfills ⁽³⁾ | 6 | 5 | 6 | 5 |
| Photovoltaic ⁽³⁾ | 37 | 36 | 4 | 4 |
| Wind | 2 | 0 | 0 | 0 |
| Biogas plants ⁽⁵⁾ | 7 | 6 | 2 | 3 |
| Sorted waste collection ⁽⁶⁾ | 111 | 103 | 97 | 92 |
| Material recovery ⁽⁶⁾ | 88 | 90 | 69 | 17 |
| Heat accumulators ⁽⁷⁾ | 14 | 14 | 9 | 5 |
| Other internal projects ⁽⁸⁾ | 11 | 9 | 9 | 8 |
| TOTAL | 769 | 699 | 740 | 672 |

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

⁽²⁾ Comparison between gross production and actual fuel consumption of the Group with the consumption that the national electricity grid and the "national average" production system would have recorded to produce the same quantities of electricity and heat.

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

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

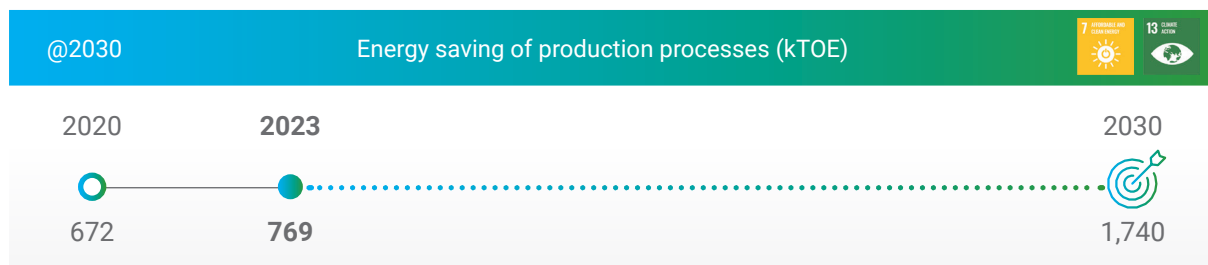
⁽⁵⁾ Cubic metres of natural gas produced (60% of biogas) multiplied by the Sm3/TOE conversion factor 0.836.

⁽⁶⁾ Energy consumption avoided for the primary production of the main materials collected, sorted and recovered in the Group's plants.

⁽⁷⁾ Fuel not consumed in the production of the stored heat.

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

The goals of the Strategic Plan include increasing energy savings from manufacturing processes to 1,740,000 TOE in 2030. For this reason, Iren Group invests in internal projects and initiatives which, in 2023, mainly concerned the energy efficiency of systems and reduction of building consumption, with an overall saving of approximately 1,100 TOE.



ENERGY EFFICIENCY CERTIFICATES (EEC)

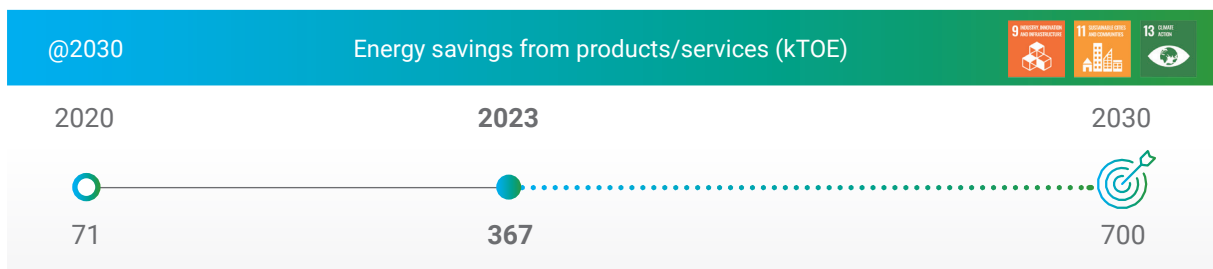
In 2023, no Energy Efficiency Certificates (EEC) were obtained in connection with the cogeneration of the Turin North plant, as the incentives ended with the last issue of Certificates in the year 2022. Therefore, the total amount of EEC obtained by the Group during the year amounted to 3,909 (equivalent to the same number of TOE), derived mainly from public lighting projects carried out in various territories during the year.

The requirement to produce (or purchase on the market) and supply Energy Efficiency Certificates to the GSE (Electricity Services Provider) is the sole responsibility of Ireti and Ireti Gas (as distributor) and is valid for 2023 (with maturity 31 May 2024).

In 2023, 55,812 EEC were purchased at an average price of 252 Euro/EEC.

Products and services for the energy efficiency of customers and communities

In order to generate positive environmental impacts downstream in the value chain, the Group has set in its Strategic Plan, a target by 2030 of 700,000 TOE of energy saved, thanks to the offer of products and services that increase the energy efficiency and self-production of communities and citizens. By 2023, savings in this area amount to 367,000 TOE (an increase of 13% compared to 2022) and can be attributed to the redevelopment of heating and air conditioning systems in public buildings, energy efficiency and rebuilding of buildings for private customers, the sale of green electricity, and the offer of “low-carbon” products and services in the Iren Plus portfolio such as the installation of photovoltaic systems for customers.



REBUILDING AND ENERGY EFFICIENCY INTERVENTIONS

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

- energy requalification of buildings and thermal systems** with the launch of numerous interventions, including several social housing buildings mainly in Genoa, Reggio Emilia, La Spezia, Savona and Padua. In 2023, some 550 public and private energy upgrading sites were managed, with 70 new sites started. The Group also won the tender to install photovoltaic systems on three industrial buildings at the commercial dock terminals in the Port of Savona that will produce more than 2 GWh of energy from renewable sources annually. In addition, the plant and building redevelopment project aimed at improving the energy efficiency of 800 buildings in the City of Turin, including schools, offices, sports facilities, cultural and religious buildings, has continued: a set of interventions (insulation systems, thermal and photovoltaic solar systems, renovation of windows and doors, and replacement of existing technological heating equipment) that will be completed in July 2030, with a forecast of energy savings of 33% compared to the historical consumption of electricity and heat;
- efficient city public lighting**, thanks to the replacement of traditional lamps with LED fixtures that guarantee a reduction in energy consumption of more than 60%. The main project concerns the city of Turin, in addition to the activities carried out in the municipalities of Alba, Asti, Biella, Cuneo, Fidenza, Vercelli and other small municipalities;

- **installation of thermostatic valves and allocators** in condominium contexts reduces consumption in individual flats with respect to the situation pre-intervention;
- **energy efficiency in industry and large-scale distribution**, with the upgrading of dedicated air-conditioning and process heat plants, installation of cogenerators or trigenerators and renewable energy plants.

ENERGY COMMUNITIES

In 2023, the Group, in line with the forecasts of the Business Plan to 2030, started work on the first Renewable Energy Community (REC) of primary station called “Parma Nord”, which saw the construction of a 956 kW photovoltaic power plant on an inactive landfill that will produce energy from renewable sources for about 1.25 GWh per year for the benefit of REC members.

In 2023, Iren Smart Solutions signed 5 surface rights for the development of ground-mounted photovoltaic plants (opening the site for the construction of one of them) and accepted as many connection requests with an installed capacity of about 1 MW. In addition, during the year, the Group received 40 full-service contracts for the construction of renewable energy plants and the set-up of the activities of an equal number of energy communities, mainly in condominiums, with an average installed capacity of about 20 kW.

REC are associations composed of local public authorities, companies, businesses or private citizens, which choose independently and/or through third-party producers to equip themselves with infrastructures for the production of energy from renewable sources and virtual self-consumption. They represent a collaborative form of energy production, centred on a local exchange system capable of facilitating sustainable development and reducing energy dependence on the national system. Users in the energy community with their own electricity generation plant sell the part in excess of their own consumption to other parties connected to the local public grid.

In addition to meeting the energy needs of their members, energy communities stimulate the emergence of new socio-economic models characterised by circularity: their members actively follow all stages of the energy process, from production to energy consumption and exchange, in accordance with the principles of environmental, social and economic responsibility that focus on the active and shared participation of people.

In order to accelerate and trigger the process of creating energy communities, Iren Group plans, for larger plants, to fully finance the investment and take care of the design, construction and maintenance of the plant as well as support users for all the technical and bureaucratic steps necessary for the creation of the energy community as a legal entity, the qualification for access to incentives and the ongoing management to ensure that participants receive the benefits.

LOW-CARBON PRODUCTS AND SERVICES

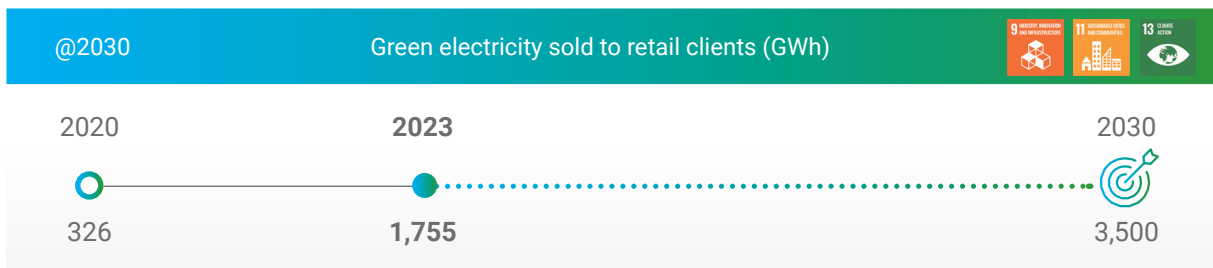
Iren Group offers a range of green products and services (Iren Plus portfolio) that allow customers to obtain important results from the point of view of rationalising energy consumption:

- **turnkey photovoltaic systems**, from design to installation, for the production of clean and sustainable energy that can be stored thanks to the storage system and used only when needed;
- latest generation **heat pumps** allow to manage gas better and save up to 40% compared to current consumption;
- high-performance **windows and doors** to improve the energy efficiency of homes;

- **intelligent thermostats** for energy efficiency that ensure the boiler is switched on for the minimum time necessary to maintain the desired temperature;
- latest generation **condensing boilers** that allow saving up to 25% in consumption. Thanks to the recovery of part of the latent heat of the fumes and, consequently, to the lower use of fuel, the boilers produce, in addition to savings, less environmental pollution.

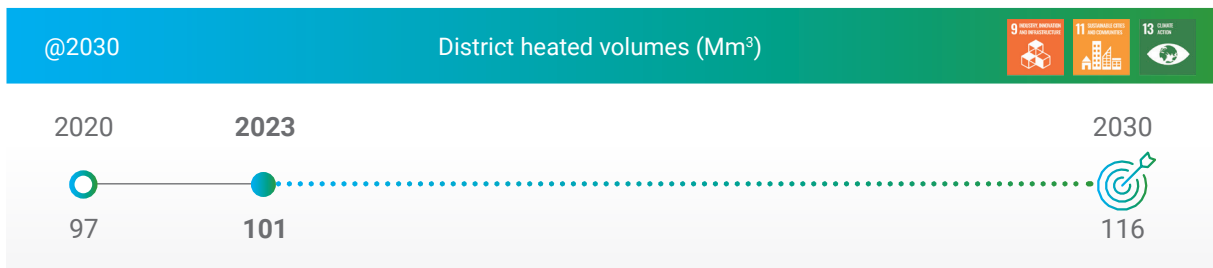
In addition to these products and services, the Group has consolidated its portfolio with the promotion of **green offers** both for the supply of **electricity** produced entirely from renewable sources, and through the first pilot projects aimed at offsetting CO₂ emissions related to the **supply of natural gas**. The solution envisaged for the latter is represented by certified carbon credits that attest to the offsetting or absorption of the CO₂ emitted into the atmosphere by the combustion of the gas. Carbon credits are generated from the development of environmental protection projects, accredited by major international standards.

Among the goals of the Strategic Plan is a steady increase in green electricity sales, to reach 3,500 GWh in 2030: in 2023, the Group sold certified green electricity for 1,755 GWh.



DISTRICT HEATING

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



As part of the project to saturate the networks in Turin, Grugliasco and Reggio Emilia and to extend the network in the northern part of Turin, new volumes of approximately 1.7 million cubic metres were connected in 2023. Furthermore, during the year, the new storage system The Heat Garden was inaugurated in Turin (» SEE PAGE 241) and the laying of the backbone for the future connection of an important new subdivision in the city of Piacenza was completed.