

Energy efficiency

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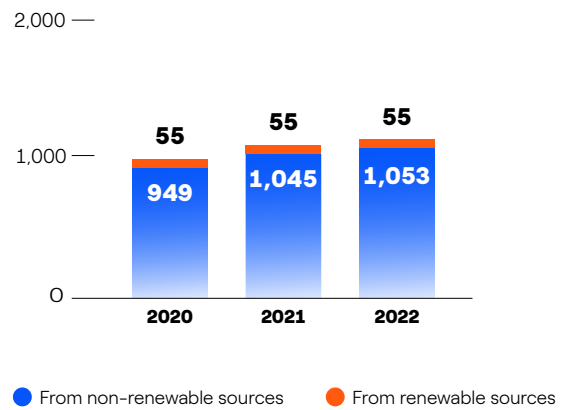
Energy efficiency in production processes

For Enel, the efficient use of energy is a constant commitment that extends to the entire value chain and which is pursued through the implementation of operational excellence programs across the different Business Lines, both for operations and in buildings. In particular, targeted interventions are aimed at maximizing the efficiency of power generation plants as well as improving the operational efficiency of distribution networks.

Energy consumption is mainly represented by fossil fuels, to operate thermal power plants (with coal accounting for 19% and natural gas 45% in 2022), and by uranium, to operate nuclear power plants (27%). By contrast, a smaller amount of energy consumption is related to the operation of power generation plants relying on renewable sources (biomass and geothermal). Total direct consumption of energy for electricity generation in 2022 amounted to 1,108,069 TJ (26.5 Mtoe), which was basically in line (0.8%) with the energy consumption of fuel recorded in 2021 as a result of the increase in thermoelectric generation from coal (64,571 TJ, up by 46% on 2021), as well as from diesel and nuclear to a lesser extent, replacing generation from natural gas (-79,774 TJ, down 15% on 2021). The Group's energy intensity, which provides a measure of its operational efficiency, was 4.81 MJ/kWh_{eq} in 2022, slightly down on the previous year (-0.36%). Activities to optimize the grid structure continued in 2022, allowing for a significant reduction in grid losses. These include pro-

gressively reducing single-phase power lines, constructing additional power lines to alleviate the overload on existing lines, using low-loss transformers, boosting the grid by using conductors with a greater cross-section, and rephasing primary transformer substations. Finally, the realization of new transformer stations that help reduce the length of low-voltage lines, which are characterized by higher levels of loss.

Consumption of primary energy from renewable and non-renewable sources (,000 TJ x10³)



Energy efficiency and electrification products for customers

The electrification of final consumption has become a central element of Enel's strategy. Its intrinsic efficiency makes it the key partner in achieving sustainable goals globally. In line with this approach, several initiatives across our businesses were strengthened and consolidated in 2022 to support commitments towards clean electrification. In 2022, the interventions carried out by the Enel X Global Retail Business Line in relation to efficiency, technological innovation and reduction of CO₂ emissions in the sectors in which the division operates, were strengthened and consolidated. In the public lighting sector, work performed in 2022 by Enel X Global Retail in Italy, Spain, Chile, Colombia and Peru resulted in cumulative savings of approximately 177 GWh. In public transport, Enel X Global Retail participated in the commissioning of more than 500 new electric buses in Chile, Colombia, Spain, Italy and the United Kingdom in 2022.

For its B2C (Business to Consumer) customers in Italy, Spain, Chile and Romania, in 2022 Enel X Global Retail in-

stalled about 78 thousand energy-efficient products, including condensing boilers, air conditioners, air-to-water heat pumps and photovoltaic plants (some with storage systems), while in the B2B (Business to Business) sector, the photovoltaic plants managed by Enel X Global Retail for its customers in Brazil, Spain, Italy, North America and Korea in 2022 made possible a generation of distributed renewable energy equal to about 42 GWh, in addition to the energy savings obtained by the cogeneration and trigeneration plants managed by Enel X Global Retail in Italy and Spain. Overall in 2022, Enel X Global Retail's efficiency and electrification products and services enabled its customers to avoid the emission of approximately 130 thousand tons of CO₂, equivalent to an environmental benefit of more than 7 million trees per year, values calculated by applying algorithms validated by an internationally recognized certification body according to the principles identified in the UNI EN ISO 14064-2:2019 standard.

For further details, see the chapter "[Clean electrification](#)".

Environmental legal disputes

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At December 31, 2022, the number of legal proceedings pending was 168 across the whole Group. The main environmental disputes related to Italy, Latin America and

Iberia. The amount of fines imposed or paid in 2022⁽³¹⁾ was approximately 1.8 million euros. In addition, 22 non-monetary sanctions were issued.

(31) The relevance threshold for fines is 10,000 USD, therefore only sanctions that individually exceed this amount are reported.