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Dear Stakeholders,

We are experiencing a profound process of technological and social transformation, whose effects cascade down and propagate in space and time, across generations and borders. A process that has changed and is changing not only countries' economies and production structure, but also the whole society and the forms in which it expresses itself. The year 2021 witnessed the continuation of the Covid-19 pandemic, although mitigated by the progress of vaccination campaigns. The year also saw a sharp increase in raw material and energy prices. The scenario was complicated even further by the arrival of the dreadful events of the recent conflict in Ukraine, which we are monitoring carefully. The 26th UN Climate Change Conference (COP26) in Glasgow succeeded in further engaging the international community in the action taken to contain global warming and its corollaries.

The world faces a major challenge that requires an immediate and concrete commitment. **Electricity** is the most efficient, safe and competitive form of energy, and, thanks to **renewable sources** and **storage**, is the key to totally decarbonize our planet, in line with the Paris Agreement goals. The energy system is becoming less dependent on fossil fuels and their volatility and is therefore contributing to building a **more sustainable future**.

At Enel, 94% of the investments planned for the three-year period 2022-2024 are in line with the United Nations Sustainable Development Goals and over 85% are aligned with the European taxonomy.

We have brought forward the **"Net-Zero" commitment** both for direct and indirect emissions by 10 years, from 2050 to 2040. We will do so by gradually phasing out coal-fired generation by 2027 and stopping the generation and sales of gas by 2040. For the second year in a row, 2021 set a record in terms of **energy produced from renewable sources**, 51% of the total generation(1). **Specific CO_2 emissions** decreased by 45% compared to the 2017 value, confirming the journey towards the SBTi-certified target of 82 gCO_{2eq}/kWh by 2030.

As part of the journey towards electrification, the **grid** plays a crucial role because it enables the integration into the system of distributed renewable plants. On a smaller scale, generation and flexible resources (such as photovoltaic panels on roofs and household batteries) can also be integrated. Moreover, the grid enables us to reach people who still do not have full access to energy.

A commitment that leaves **no one behind**, that takes into account the needs of all our stakeholders, with particular reference to the **most vulnerable**. The aim is also to promote **sustainable use of resources**, to thwart loss of biodiversity.

We wish to promote a **transition** that is **transparent** and **orderly**, avoiding the creation of inequalities, based on **active listening**, **openness** and **creative solutions**; a transition that is capable of unleashing talents and passions, of leveraging uniqueness, of strengthening the bond with communities, of engaging customers and suppliers. **People** are the true competitive factor, and we share, in the spirit of cohesion, internally and externally, the values that guide our daily commitment: trust, responsibility, innovation, proactivity.

We have made our **business model sustainable** throughout the entire value chain and we have ensured that sustainability covers varying geographical, economic and social contexts.

We are working tirelessly, in line with recent international developments, on **new metrics and new measurement concepts** to represent the creation of value and the quality of relations with different stakeholders, in a more and more complete and transparent way. We continue to integrate sustainability objectives into our **financial instruments** and management **remuneration plan**, and our leadership has once again been acknowledged on a global level in the main **ratings, rankings and sustainability indices**.

We continue to look ahead into the future, and we work together with our stakeholders to ensure that society makes sustainable progress.

(1) The figures include managed generation. Generation from the consolidated perimeter is 109 TWh produced from renewable energy and 114 TWh produced at thermoelectric plants, a total of 223 TWh.

The path to Net-Zero

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As one of the first signatories of the "**Business Ambition for 1.5 °C**" campaign promoted by the United Nations and other institutions, we have committed to developing a business model in line with the objectives of the Paris Agreement (COP 21) to limit the average global temperature increase to 1.5 °C.
In 2021, we announced **the bringing forward of our Net-Zero target from 2050 to 2040**, for both direct (Scope 1) and indirect (Scope 2 and 3) emissions. Specifically, with regard to power generation and the sale of electricity and natural gas to end customers, we have committed to achieving zero emissions, without resorting to CO_2 removal measures or nature-based solutions such as reforestation. We have also confirmed our target to **reduce our direct GHG emissions per kWh_{eq} by 80% by 2030**, compared to the 2017 base year, in line with the goal of limiting global warming to 1.5 °C, as verified by SBTi. This commitment requires the Group's direct emissions to be 82 gCO_{2eq}/kWh by 2030. In addition, we have disclosed two new reduction targets, one **integrated for emissions related to the generation and sale of electricity**, with **an 80% reduction** by 2030 compared to 2017 levels, and the other for **emissions related to gas sales**, with **a 55% reduction** by 2030 compared to 2017 levels.
The objective of achieving total decarbonization by 2040 requires a strong acceleration on renewables and energy efficiency, as well as a complete rethinking of investment planning and the economic model, including in terms of circularity. In this regard, we are acting on the main lever of direct emissions and at the same time broadly rethinking our business model to work on all other dimensions. We have increased the degree of **reporting accuracy**, as well as **transparency** regarding the various categories of indirect emissions. Although these are voluntarily tracked in relation to their significance, we have increasingly mapped emissions from fuel extraction and transport, grid losses, self-consumption and relations with suppliers. A particular focus is placed on the **climate change adaptation** policies in order to increase the resilience of the assets along the entire value chain, thereby limiting potentially negative impacts and guaranteeing a safe and sustainable energy service in all the countries in which the Group operates.

In order to guarantee increased **transparency** in its communications and relationships with its stakeholders, we periodically report on our related activities around climate change in line with the international standards of the **GRI (Global Reporting Initiative) and the Sustainability Accounting Standards Board (SASB)** and are publicly committed to adopting the recommendations of the **Task force on Climate-related Financial Disclosures (TCFD)** of the Financial Stability Board, which in June 2017 published specific recommendations for the voluntary reporting of the financial impact of climate risks. We have also integrated the "**Guidelines on reporting climate-related information**" published by the European Commission in June 2019. Furthermore, we have taken into account guidance from the "Enhancement and Standardization of Climate-Related Disclosures" of the **SEC** (Securities and Exchange Commission'), the first draft standards issued on the **EFRAG** website, and the **ISSB's** recently published exposure draft. The TCFD Advisory Council also worked on scenarios in 2020 and since then we have been involved in a number of initiatives around **scenario analysis**, sharing our expertise to support the widespread and transparent adoption of these practices across a growing number of companies.

227 gCO_{2eq}/kWh
Specific CO_2 emissions (Scope 1)

80%
reduction of direct CO_2 emissions per kWh_{eq} (Scope 1) by 2030, compared with 2017 (SBTi-certified target)

53.6%
renewable net maximum capacity

87%
EBITDA for low-carbon products, services and technologies

201 gCO_{2eq}/kWh
Scope 1 + Scope 3 emissions for electricity sales

22.3 $MtCO_2$
Scope 3 emissions for sales of gas

125.0 $MtCO_2$
Overall Group carbon footprint

11.7 $MtCO_2$
Carbon footprint associated with the supply chain

Engaging stakeholders in combating climate change

Enel promotes the engagement of its main external and internal stakeholders in order to increase their awareness and develop a constructive dialog that can provide a valuable contribution toward the creation of solutions that mitigate climate change and create value for the Group. The most relevant actions carried out in 2021 include:

- **materiality analysis**: climate change, in terms of priority for stakeholders and Company performance in the various countries in which it operates, was one of the topics discussed during identification of the main stakeholder priorities in sustainability planning;
- **Enel Focus On**: over the last year, twenty virtual meetings, known as #AsktheProfessor, were uploaded online, aimed at involving lecturers and experts so as to initiate an open dialog with Group management on the main challenges of the energy transition. A variety of climate-related topics was covered, such as renewable energy, the sustainable future, the customer as energy generator, utilities for a sustainable planet, incorporating sustainability into business, energy transition goals, and the most effective policies to reduce greenhouse gas emissions;
- **social media**: Enel has continued using social media to raise public awareness about topics related to climate change, including decarbonization, renewable energies, electrification, electric mobility and responsible energy consumption;
- **Twenergy**: a digital ecosystem launched by Endesa, the Group's subsidiary in Spain, with the purpose of raising awareness and informing on issues related to energy efficiency, electrification, sustainable development, the circular economy and equitable transition, opening the debate to professionals and specialists from different sectors to build a platform for information and training which is as diverse as possible. In 2021, there were about 820 thousand visits to the platform, while in the main social networks the total impressions were about 500 thousand. Within Twenergy, the "Sustainable Spirits" project was also created, an initiative to give visibility to all people who are aware of sustainability and respect the environment;
- **raising the awareness of local communities**: with the Creating Shared Value (CSV) model, Enel is involving local communities, making them aware of issues related to climate change and explaining how renewables are an extremely effective solution, with benefits not only for the environment but also for the creation of new jobs and for social-economic development;
- **raising the awareness of our people**: Enel involves all the people that work for the Company in awareness activities in order to increase their engagement in climate change aspects and promote a culture of innovation and business entrepreneurship on a global level to overcome the energy challenges. Enel Digital Days 2021, which are annual company events, promoted discussions and exchanges about topics such as electrification, decarbonization, digitalization and urbanisation. The main priorities of the Strategic Plan for the next three years were presented, in line with what was communicated to the financial community during the Capital Markets Day.

Enel's advocacy activities for the climate

Within the framework of its commitment to climate change, the Enel Group is firmly committed to promoting and defining:

- **ambitious climate and decarbonization targets** consistent with the objectives set by the Paris Agreement, for example by being among the first signatories in 2019 of the Business Ambition for 1.5 °C campaign promoted by a global coalition of UN agencies, including the UN Global Compact, and business leaders, which reached over 1,000 signatures in 2021;
- **effective and efficient implementation mechanisms** capable of exploiting market dynamics and, in this sense, fully supporting the presence of a carbon price;
- **ongoing negotiations on climate issues within multi-stakeholder initiatives**, actively contributing to groups and coalitions such as the UN Global Compact's Action Platform on Climate Ambition and the World Bank's Carbon Pricing Leadership Coalition;
- **private sector leadership on decarbonization** through its continued participation in initiatives such as the CEO Alliance, WEF CEO Climate Leaders Alliance, IETA (International Emissions Trading Association), WBCSD (World Business Council on Sustainable Development), and regional and national trade associations.

Enel is committed to ensuring that its direct advocacy activities are conducted in line with the objectives of the Paris Agreement. In particular, Enel's advocacy policy aims to promote the Group's decarbonization strategy and pursuit of climate goals, involving institutional stakeholders, trade associations, non-governmental organizations and academia, in order to promote the Group's vision on climate and low-carbon policies. Stakeholder engagement contributes to the evolution of the regulatory framework towards ambitious climate goals and promotes an economy in which carbon pricing drives long-term investments. To do this, Enel interacts directly with policy makers, contributes to the positioning of trade associations, and interacts with a broader set of stakeholders to build consensus and support for specific policy proposals. As a strong supporter of carbon pricing, Enel supports its integration into the decision-making process in all countries where it operates. In doing so, Enel emphasizes the importance of well-functioning carbon taxation and trading mechanisms that can provide short- and medium-term predictability to support market efficiency, as well as strong long-term price signals to support investment and innovation.

During 2021, the Group represented its interests at the European level and promoted its position vis-à-vis the European Institutions (Commission, Parliament, Council) with the aim of influencing proposals and decisions that could have affected the EU's Climate and Energy Framework, and also the Group's activities. When carrying out its advocacy in Europe, Enel is committed to behaving in a transparent and responsible manner. We are listed on the European Transparency Register(1), the specific activities of which are linked to the main EU legislative and policy proposals (including European Green Deal, Fit for 55, Climate Law, ETS reform, Air Quality Directives, Sustainable Finance, State Aid and Competition, Hydrogen, Taxonomy). The dedicated website contains a public list of meetings Enel has held with Commissioners, Members of their Cabinet and EC Directors General between December 2014 and January 2022. Specifically, for 2021, topics discussed included: European Green Deal, Energy Taxation Directive (ETD), Carbon Border Adjustment Mechanism (CBAM) and RES & ETS. In addition, Enel's positions and responses to EU consultations are made public, together with a list of the main professional associations and think-tanks in which Enel is active.

The worldwide coordination of Enel's global public policy positioning on climate is ensured by the European Affairs unit. This unit is responsible for developing global scenarios and position papers on climate policies. Its objective is to guide Enel's national and local advocacy activities, thanks to a continuous dialog with institutions and the widest possible range of stakeholders active in the climate debate. In this sense, Enel is also committed to working to ensure continuous and full alignment with the objectives of the Paris Agreement of any association of which it is a member.

Nationally, Enel's pursues its advocacy efforts through specific activities and broader stakeholder engagement on decarbonization and energy transition issues. The approach is similar to that adopted at global level. Advocacy objectives include promoting greater climate ambition, carbon pricing, accelerating the penetration of renewable technologies, developing and upgrading infrastructure through smart grid technologies to support the energy transition, and electrification as a means for decarbonizing energy end-uses. In addition, through "Energy Transition Roadmap", engagement platforms Enel engages with a wide range of stakeholders on the actions needed at national level to pursue the Paris Agreement goals. These platforms take decarbonization by 2050 as a starting point in line with the Paris Agreement, then proceed to identify the technology mix needed to achieve this long-term goal in 2050, as well as the medium-term goal of 2030, and to develop specific policy recommendations aimed at achieving this transformation. All of these activities are supported by ongoing engagement with a wide range of stakeholders.

(1) https://ec.europa.eu/transparencyregister/public/consultation/displaylobbyist.do?id=6256831207-27.
By registering, Enel signed the Transparency Register Code of Conduct, and also declared that it is bound by its own Code of Ethics.

Enel's positioning on key climate policies and frameworks

Several regulatory and legislative events that occurred in 2021, not only climate-specific regulations but also energy and environmental regulations that have a strong impact on the climate itself, are relevant to Enel's business and advocacy actions. In light of the increased streamlining of the climate challenge within broader policy and regulation at the global, national, regional and local levels, the number of dossiers on which Enel focuses its advocacy increases annually. Enel's positioning on the main dossiers is outlined below.

- **In all the countries where it operates, the Enel Group strongly promotes greater climate ambition in line with the Paris Agreement**. Believing in the urgency in combating climate change, and having adopted, as a company, SBTi objectives aligned with the Paris Agreement, Enel supports public the framework of a just transition. Enel's advocacy in this area is implemented through *ad hoc* engagement on specific legislative proposals (e.g. the European Climate Law), but also through broader stakeholder engagement at national level through our Energy Transition Roadmap platform (see above). Through such platforms, Enel promotes NDCs (Nationally Determined Contributions) that fully reflect the highest possible climate ambition and are fully in line with the requirements of the Paris Agreement.

- **In the context of the debate on international cooperation regarding the Paris Agreement, Enel supports a rapid finalization of the implementing provisions of Article 6 on climate change cooperation**. This position is in line with the fact that Enel supports the adoption of carbon pricing mechanisms worldwide. The implementation of these mechanisms based on Cap and Trade systems should be preferred in industrialized economies and industrial sectors where operators can effectively manage and internalize the price signals recorded on the market in their decision-making processes. Conversely, carbon-pricing mechanisms should tend to take the form of carbon taxes in countries with weaker institutions and in sectors characterized by distributed emission sources, and where non-economic barriers are significant. The Enel Group strongly supports carbon pricing as a means to decarbonize economic systems efficiently and effectively around the world. Enel's positions on the adoption of carbon pricing have been conveyed directly and through participation in the activities of IETA, CPLC, Eurelectric and WBCSD. In 2021, specific activities were dedicated aimed at analyzing and promoting carbon pricing, at global, regional (EU and Latin America) and national (EU member states, Chile, Colombia and Peru) levels.

- **Within the EU, the European Green Deal represents a unique opportunity to accelerate the EU's path to a fully decarbonized and sustainable economy, especially when aligned with the mobilization of significant resources to ensure a rapid recovery from the ongoing crises**. Achieving the EU's climate and environmental goals requires a new industrial strategy to reach climate neutrality, and an action plan for the circular economy, pursuing the decarbonization of each sector. The energy sector must aim to be fully decarbonized and ensure the decarbonization of other sectors of the economy through direct and indirect electrification. The study "Sustainable paths for EU increased climate and energy ambition", sponsored Fondazione Enel and other partners, highlights the fact that end-use electrification is necessary for full decarbonization.

- **Enel supports the EU Climate Law, which places environmental and other challenges at the heart of the EU's vision and strategy for inclusive and sustainable growth**. The long-term goal of carbon neutrality in 2050 and the intermediate 2030 target of at least a 55% reduction in greenhouse gases, compared to 1990 levels, was set as a guide for all other EU policies. The law also establishes a guiding vision and governance to ensure that all EU policies, actions, and strategies are aligned with the climate goal, including education, financing, R&D, innovation, tax policies, labor and social policies. In doing so, the law establishes a principle that all policies should be designed and evaluated based on a careful assessment of their full impact. This assessment includes the full range of different benefits in terms of air quality, circular economy and energy efficiency. In addition, the EU Climate Law includes a pathway to establish an intermediate climate target at 2040, taking into account the principles of "just transition", recognition of the need to strengthen the EU's carbon resources through a more ambitious LULUCF (Land Use, Land-Use Change, and Forestry) regulation, for which the Commission submitted a proposal in July 2021, a commitment to negative emissions after 2050, and the establishment of the European Scientific Advisory Board on Climate Change, which will provide independent scientific advice.

- **Enel supports the EU's proposed ETS reform, which must be strengthened to pursue the EU's higher climate ambition and supported by a Carbon Border Adjustment Mechanism**. The linear reduction factor should be increased to achieve the additional emission reductions required of EU ETS sectors and to provide a clear price signal to the market. The market stability reserve should be revised to increase price stability and balance the market surplus. The introduction of the road transport and buildings sectors into the ETS should be approached with caution, as it could compromise the reliability of the carbon price signal in the short to medium term and have significant negative impacts in terms of s just transition. Finally, Enel supports the adoption of the Carbon Border Adjustment Mechanism to provide greater climate ambition while reducing the risks of carbon leakage. Implementation of the mechanism should go hand in hand with intensified discussions on increasing climate ambition with the EU's key global trading partners.

- **Enel supports a revision of the Effort Sharing regulation that fully exploits the decarbonization potential of energy end-uses in the EU's increased climate ambition.** The review must aim to update the Effort Sharing Regulation (ESR) targets of individual member states in an upwards direction, in line with the higher ambition of 2030. The ambition must also be aligned with 2050 climate neutrality, to avoid lock-in of emitting technologies and infrastructure. However, the impact on prices and energy bills must be carefully managed. The multiple environmental benefits associated with a higher ambition allow for a deviation from cost-efficiency criteria, as the decarbonization of transport and buildings brings environmental benefits that are not accounted for in GHG costs.

- **Enel welcomes the publication of the hydrogen and gas market decarbonization package by the European Commission**. The package also includes the proposed regulation on reducing methane emissions throughout the energy value chain and introduces new requirements for measuring, reporting and verifying emissions, as well as emission abatement measures. In addition, the regulation also proposes rules to increase transparency on methane emissions associated with fossil fuel imports.

- **Enel supports the European Commission's proposal on an upward revision of the EU's 2030 energy efficiency target of at least 36% for final energy consumption and 39% for primary energy consumption to achieve the ambition of reducing greenhouse gas emissions by 2030**. Significant energy efficiency improvements are needed to achieve the Net-Zero emissions target by 2050. As such, the proposed revision of the Directive, as part of the "Delivering on the European Green Deal" package, raises the level of ambition of the EU's energy efficiency target and makes it binding.

- **Enel welcomes the Commission's initiative to review the Renewable Energy Directive**. It believes that the main contributions to efficient decarbonization of the energy sector, as well as buildings, heating and cooling, transportation and industry, will come from further end-use electrification (direct electrification and indirect electrification for sectors that are difficult to abate emissions by means of renewable hydrogen). In this regard, low carbon fuels should be excluded from the scope of this Directive. Enel believes that the EU regulatory framework should provide long-term predictability for investors, as well as simplified and standardized authorization procedures. Finally, Enel supports a technology-neutral approach that at the same time creates the necessary conditions for the penetration of fully sustainable technologies.

- **As part of the European Commission's hydrogen strategy, the Enel Group actively promotes renewable hydrogen** (e.g. generated by electrolysis powered by 100% renewable energy). Enel believes that this is the only truly sustainable generation pathway for hydrogen, powered by renewable sources with zero greenhouse gas emissions. Hydrogen is best used as a complement to electrification, not as a competitor. It has an efficient role in decarbonizing those parts of the economy that cannot be electrified easily or economically, for example, hard-to-abate sectors, such as heavy industry, aviation and shipping.

- **As part of its smart and sustainable mobility strategy, the Enel Group is actively promoting e-mobility** as a key factor in reducing road transport emissions and contributing to the achievement of EU energy efficiency targets. Since 2011, the EU has been involved in the process of updating its transport policy framework to reduce emissions in the sector, particularly road transport. Mobility is a critical aspect of social inclusion and an important factor in human well-being, especially for disadvantaged groups. Recognized as an essential service in the European pillar of social rights, transport meets a fundamental need in enabling citizens to integrate into society and the labor market. By far the most serious challenge facing the transport sector is to reduce its emissions significantly and become more sustainable. The European Green Deal calls for a 90% reduction in GHG emissions from transport so that the EU can become a climate neutral economy by 2050, including working towards a zero pollution ambition. In addition, in 2021 the European Commission unveiled

the "EU Urban Mobility Framework", complementing the proposed revised guidelines for the Trans-European Network. The new EU Urban Mobility Framework outlines a common list of measures and initiatives for with which EU cities can address the challenge of making their mobility more sustainable.

- **Enel fully supports the European building renovation strategy and actively participates in discussions on the proposed review of the Energy Performance of Buildings Directive**. The building sector is one of the most lagging industries as regards decarbonization due to criticalities in the value chain, building efficiency and choice of energy source. Enel believes it can contribute substantially to the decarbonization of the building sector by installing efficient electrical technologies such as heat pumps, improving building efficiency through digitalization, making buildings dynamic elements of the energy system through storage, remodeling of demand, and electric vehicle charging.

- **Enel has involved various stakeholders in the European Commission's New Circular Economy Action Plan, stressing the importance of ensuring the circularity of the main supply chains**, particularly in relation to electric vehicles, batteries and renewable energy technologies. Furthermore, Enel's advocacy has highlighted the need to develop appropriate circular economy metrics and to focus on the high potential of urban environments through the implementation of a clear vision of circular smart cities.

- **Within the framework of the Zero Pollution dossier and other environmental dossiers, the Enel Group is actively promoting the maximization of synergies between decarbonization and other environmental policies.** In this context, synergies of climate and air quality policies are perhaps the most critical, and electricity technologies can play a key role in combating climate change, improving local air quality and increasing the circularity of the EU's economic system. Soil management is vital for a circular economy that aims to develop sustainable models capable of encouraging the coexistence of different activities and creating synergies and mutual benefits, such as agri-voltaics. The new soil strategy published in November is a step in the right direction. However, its scope should also be extended to the redevelopment of brownfield sites and the reuse of brownfields to avoid further land acquisition and soil pollution.

In addition to the position outlined above on specific issues, the Enel Group is actively contributing to the debate on how best to address the challenge of climate change. Specifically:

- **Enel played an active role in the different preparatory events of COP 26 in Glasgow**, dealing with several issues related to climate change, such as climate ambition, the Net-Zero challenge, carbon pricing schemes and international carbon markets, but also the mobilization of sustainable finance for combating climate change. Enel is fully committed to contributing to the efficient acceleration of the energy transition and to bringing the world economies onto the Net-Zero path, as mentioned in the latest IPCC Report.

- **Enel has actively contributed to GSEP (Global Sustainable Energy Partnership) climate change activities**. In 2021, GSEP launched its annual report, focused on beneficial electrification, at the 2021 Virtual GSEP Global Summit, with Enel X Global Retail CEO Francesco Venturini Co-Chairing. GSEP also hosted a virtual dialog on electrification at Climate Week in New York, with Enel on the panel. Other GSEP activities carried out in 2021 include Enel's participation in the Young Ambassadors for Global Electrification program, global advocacy on sustainable electrification, the launch of new research on tracking the deployment and pace of electrification globally, webinars and capacity building activities.

- **Enel supported IETA (International Emission Trading Association) in its 2021 action plan focused on analyzing how emission trading can facilitate increased ambition in both the private and public sectors**. IETA promotes maximum transparency of accounting rules under Articles 5 and 6 of the Paris Agreement, the international aviation carbon offset and reduction system, and the rules developed under voluntary markets. IETA contributed substantially to the success of the COP 26 negotiations on collaborative approaches. At the regional level, the association collaborated on the European Commission's proposal to strengthen the EU ETS and increase climate ambition. It also supports the emergence of carbon pricing schemes in the Americas and Asia. It does so based on the firm belief that emission trading can enhance the ambition of climate policies while ensuring a high level of environmental integrity.

- **In 2021, Enel launched the new Energy Transition Roadmap platforms for Italy and Romania, bringing the number of active platforms in the Group to more**

than 10. In early 2021, the Energy Transition Roadmaps (ETRs) for Peru and Morocco, both launched in 2020, were completed. The ETRs take an open approach, sharing technical knowledge and policy views with national and international stakeholders. The ETRs aim to exploit fully three of the main levers available to decarbonize national economies: zero-emission electricity, digitalization and smart grids and end-use electrification. They do this by developing a robust, transparent and stable political and regulatory framework, which in turn is able to catalyze effectively private sector action under the Paris Agreement.

The Energy Compact on Enel's sustainable strategy

In 2021 Enel took part in the **High-Level Dialog on Energy (HLDE) of the United Nations**, which led to the launch of a global roadmap to set specific targets in accelerating the transition and promoting energy access by 2030, and the announcement of the Energy Compacts, a set of voluntary commitments aimed at accelerating the achievement of SDG 7 – Ensure access to affordable, reliable, sustainable and modern energy for all – and zeroing out net emissions.
In fact, Enel was among the first companies in the world to present its Energy Compact, with the following ambitious global commitments: accelerating coal phase-out from 2030 to 2027; tripling renewable capacity to 145 GW by 2030, from around 49 GW in 2020; increasing battery energy storage to 20 TWh and demand response to 20 GW by 2030; reducing GHG Scope 1 emissions to 82 g/kWh in 2030, in line with the 1.5 °C scenario (verified by SBTi); installation of more than 4 million electric vehicle charging points and operation of 10 thousand electric buses by 2030; target of reaching 5.6 million beneficiaries with new connections in rural and suburban areas in the period 2020-2030 (target later increased to 6.9 million in the same period). The commitments in the Energy Compact were subsequently updated in the Strategic Plan and the Sustainability Plan 2022-2024, for which the dashboards at the beginning of the chapters in this document should be consulted.

Enel's impact on climate change

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Electric energy is essential to guarantee the sustainable progress of modern societies and represents a key factor in reaching the goals of the United Nations 2030 Agenda, in particular SDG 7, to guarantee everyone accessible, reliable, sustainable and modern energy, and SDG 13, regarding climate action.

The generation of electricity has always played a key role in climate change, as the use of fossil fuels is a considerable source of greenhouse gas emissions. Technological development, in particular in the area of renewable energies, has however completely transformed this scenario by making electricity one of the main solutions for reducing the carbon footprint world-wide. Enel is aware of these impacts and implements specific actions to minimise them, promoting the decarbonization of the energy system and the electrification of the energy demand. As a result this reduces the greenhouse gas emissions along the entire value chain.

Enel's generation from fossil fuels (mainly gas and coal) traditionally represents the main source of greenhouse gas emissions. In particular, in 2021 the direct emissions (Scope 1) related to generation from fossil fuels were about 51.2 mil t_{eq} CO_2, whereas indirect emissions (Scope 3) related to the extraction and transport of fuels were 11.2 mil t_{eq} of CO_2 (also considering those related to the transport of raw materials). Enel is reducing this impact by accelerating the decommissioning of coal-fired plants, with a reduction of capacity in 2021 of around 2 GW compared to 2020. In parallel, the Group is increasing the development of renewable capacity that, together with the contribution of nuclear generation, has avoided 72.8 mil t_{eq} of CO_2 emissions. Furthermore, Enel is actively committed to the development of electricity storage systems that support the integration of renewable capacity, with a total installed capacity of 217 MW in 2021. The decarbonization of the energy mix also has a positive impact on the reduction of indirect greenhouse gas emissions (Scope 2) associated with the acquisition of electricity to cover the requirements of business activities.

The management of the electricity grid involves the generation of indirect greenhouse gas emissions (Scope 2) associated with technical energy losses on the grid of 3.0 mil t_{eq} of CO_2 in 2021 (according to the "location based" calculation methodology). Enel is actively investing in the digitalization and automation of the electricity grid to reduce these losses and increase reliability, while promoting the diffusion of renewables in the energy system.

In the framework of the end customer, the use of the products sold by Enel's customers generates GHG emissions that are accounted for as indirect (Scope 3). In particular, **the emissions connected to the use of electricity sold to customers equalled approximately 24.0 mil t_{eq} of CO_2, whereas those related to gas sold equalled 22.2 mil t_{eq} of CO_2**. Enel regularly monitors these emissions and adopts measures aimed at minimising them. Furthermore, Enel offers its customers technical solutions to reduce carbon emissions related to their energy consumption in a wide range of sectors, including transport, property management as well as industrial processes and services. For example, through Enel X Global Retail the Group is promoting the spread of charging infrastructures for electric vehicles (0.3 million charging points installed by 2021[(3)]), the development of energy efficiency solutions, distributed generation, advisory services, smart public lighting and circular cities.

(3) Public and private charging points installed. Includes interoperability points, net of which there are 157 thousand charging points installed at the end of 2021.

Enel's impact on climate change

Positive impacts

CO_2 free generation[1]		Digitalization of the grid		Electrification of the energy demand and promotion of energy efficiency	
72.8 million t_{eq} of avoided CO_2	• Avoided CO_2 emissions from electricity generation • Contribution to CO_2 emission reduction in other sectors[2] through a zero-emission energy mix	45.0 million end users with active smart meters	• By providing data in quasi real time, smart meters permit an efficient management of the energy supply and demand, promoting informed and sustainable consumption	319 thousand charging points for electric mobility	• Contribution to CO_2 emission reduction in other sectors through the electrification of consumption, including transport by promoting e-mobility
217 MW	• Increase in storage capacity[3]	2.77 number of service interruptions per client (SAIFI)[4]	• A reliable and resilient grid helps reduce the CO_2 emissions associated with grid losses	2.8 million smart public lighting points	• Energy efficiency solutions for reducing consumption (residential, city and industry)

Negative impacts

Value chain	Generation	Networks		Retail	
51.2 million t_{eq} CO_2	• Direct greenhouse gas emissions for electricity generation (Scope 1)[5]	3.0 million t_{eq} CO_2	• Indirect greenhouse gas emissions associated with technical losses from the grid (Scope 2)[6]	24.0 million t CO_2	• CO_2 emissions associated with the use of electricity sold on the retail market (Scope 3)
11.2 million t_{eq} CO_2	• Indirect greenhouse gas emissions deriving from the extraction and transport of fuels, raw materials and waste (Scope 3)			22.2 million t_{eq} CO_2	• CO_2 emissions associated with the use of natural gas sold on the retail market (Scope 3)
Thermal production		**Technical losses from the grid**		**Sale of retail electricity and gas**	

(1) Includes the generation of renewable and nuclear energy.
(2) The GHG Protocol requires considering the consumption of electricity when calculating the Company's carbon footprint as indirect emissions (Scope 2).
(3) Includes the contribution of the Enel Green Power and Thermal Generation Business Line.
(4) SAIFI, System Average Interruption Frequency Index.
(5) Other Scope 1 emissions have been disclosed in the section "Enel's performance in combating climate change". See "Enel's carbon footprint" for further details.
(6) Other Scope 2 emissions have been disclosed in the section "Enel's performance in combating climate change". See "Enel's carbon footprint" for further details.

Climate scenarios

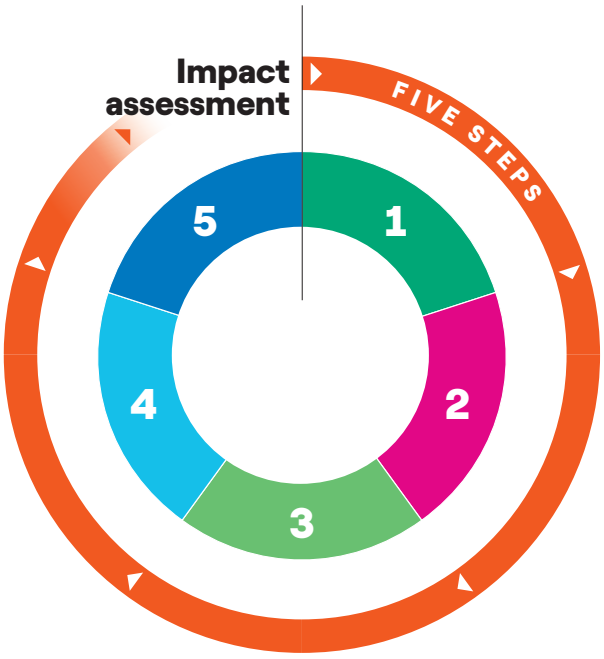
The Group develops short, medium and long-term scenarios for the energy industry and for macroeconomic and financial conditions in order to support its strategic and industrial planning, capital allocation, strategic positioning, and assessment of risk and resilience of the strategy.
Analysis and benchmarking of external energy transition scenarios was also carried out which, together with the analysis of relevant reports on macroeconomic, commodity and climate trends, fed internal modeling for definition of the assumptions of long-term scenarios.
Global energy scenarios are typically classified by scenario families based on the level of climate ambition:

- **Business as usual/Stated policies**: energy scenarios based on business as usual/current policies. They provide a fairly conservative benchmark for the future, representing the evolution of the energy system in the absence of additional climate and energy policies. These scenarios do not achieve the goals of the Paris Agreement.
- **Paris Aligned**: energy scenarios aligned with the Paris Agreement, i.e., that include a goal of limiting global average temperature increase to "well below 2 °C" compared to pre-industrial levels. To achieve this goal, scenarios in this category consider new and more ambitious policies for end-use electrification and the development of renewables.
- **Paris Ambitious**: global energy scenarios that chart a path toward Net-Zero GHG emissions by 2050, consistent with the Paris Agreement's most ambitious goal of stabilizing the average increase in global temperatures within 1.5 °C. All scenarios in this group agree that the main drivers of the energy transition to Net-Zero by 2050 are the process of end-use electrification and the increase in electricity generation from renewables in both the medium and long term. They differ, however, on the additional solutions needed in the long term to close the gap to the Net-Zero emissions target, assigning different levels of importance to the contributions of various technologies and changes in consumer behavior.

The issues of industrial and economic transition towards solutions that can reduce CO_2 concentrations in the atmosphere are the characteristic elements of the "**energy transition scenario"**, while the issues related to future trends of climate variables (in terms of acute and chronic phenomena) define the so-called **"physical scenario", which takes acute phenomena** (heat waves, floods, hurricanes, etc.) into account. This includes their potential impact on industrial assets, as well as chronic phenomena related to structural changes in the climate, such as the trend of temperature increase, sea level rises, etc., which

may result, for example, in a steady change in plant output and a change in electricity consumption profiles in the residential and commercial sectors.
The scenarios are construed with an overall framework in mind to ensure consistency between transition assumptions and climate projections.
The adoption of these scenarios and their integration into corporate processes takes account of the guidelines of the TCFD and enables the assessment of the risks and opportunities connected with climate change. For this reason, the Group has created a channel of constant dialog and collaboration with experts on climate change, for example the Department of Geosciences of the International Centre for Theoretical Physics (ICTP) in Trieste. Furthermore, it is structured for managing high-resolution post downscaling climatic scenarios and has started projects for developing the skills needed to translate the complexity of climate models into information that is useful for understanding the effects, at a local level, on business and support strategic decisions.
The acquisition and processing of substantial amounts of information and data required for the definition of scenarios, as well as the identification of the methodologies and metrics needed for interpreting complex very high-resolution phenomena and, in the case of climate scenarios, requires a continuous dialog with both external as well as internal references. For this purpose, the Group operates with a platform approach, equipping itself with tools that guarantee solid and accessible information. The process that translates the scenario phenomena into information

that is useful for industrial and strategic decisions can be summarized in five steps:



1. **Identification of trends and factors** relevant to the business (e.g., electrification of consumption, heat waves, etc.)
2. Development of **link** functions connecting climate/transition scenarios and operating variables
3. Identification of **risks** and **opportunities**
4. **Calculation of impacts** on business (e.g., change in performance, losses, Capex)
5. **Strategic actions:** definition and implementation (e.g., capital allocation, resilience plans)

The transition scenario

The transition scenario describes how the generation and consumption of energy evolves in various sectors in an economic, social, policy and regulatory context consistent with different trends in greenhouse gas (GHG) emissions and, therefore, correlated with the RCP climate scenarios. The scenarios used by the Group on a global level are the result of a benchmark analysis of external scenarios and currently known policy objectives. For the main countries where the Group is present, it processes coherent transition scenarios, using energy system models; if internal models are not available, risks and opportunities are evaluated by analyzing scenarios produced by third parties, as described previously.

The main assumptions considered when defining the transition scenarios concern:

- **the local policies and regulatory measures to fight climate change**, such as measures for reducing carbon dioxide emissions and fuel consumption, to increase energy efficiency and the decarbonization of the electricity sector;
- **the global macroeconomic and energy context** (for example, in terms of gross domestic product, population and commodity prices), considering international benchmarks such as the International Energy Agency (IEA), Bloomberg New Energy Finance (BNEF), International Institute for Applied Systems Analysis (IIASA)[4], and others;
- **the evolution of technologies for generation,** conversion and energy consumption, in terms of both technical operating parameters and costs.

In 2021, Enel revised its medium- to long-term energy transition scenario framework, defining three alternative scenario narratives.

- **Paris scenario** - envisions the achievement of the Paris Agreement targets, thus a significantly higher level of climate ambition than business as usual. The increased ambition is supported by greater electrification of consumption and increasing development of renewables.
- **Slow Transition scenario** - a scenario characterized by a slower energy transition, which means the Paris Agreement targets will not be met. This scenario involves a smaller increase in renewables and a less sustained electrification process than the Paris scenario, especially in the short term (delayed implementation of the transition).
- **Best Place scenario** - is constructed to evaluate as-

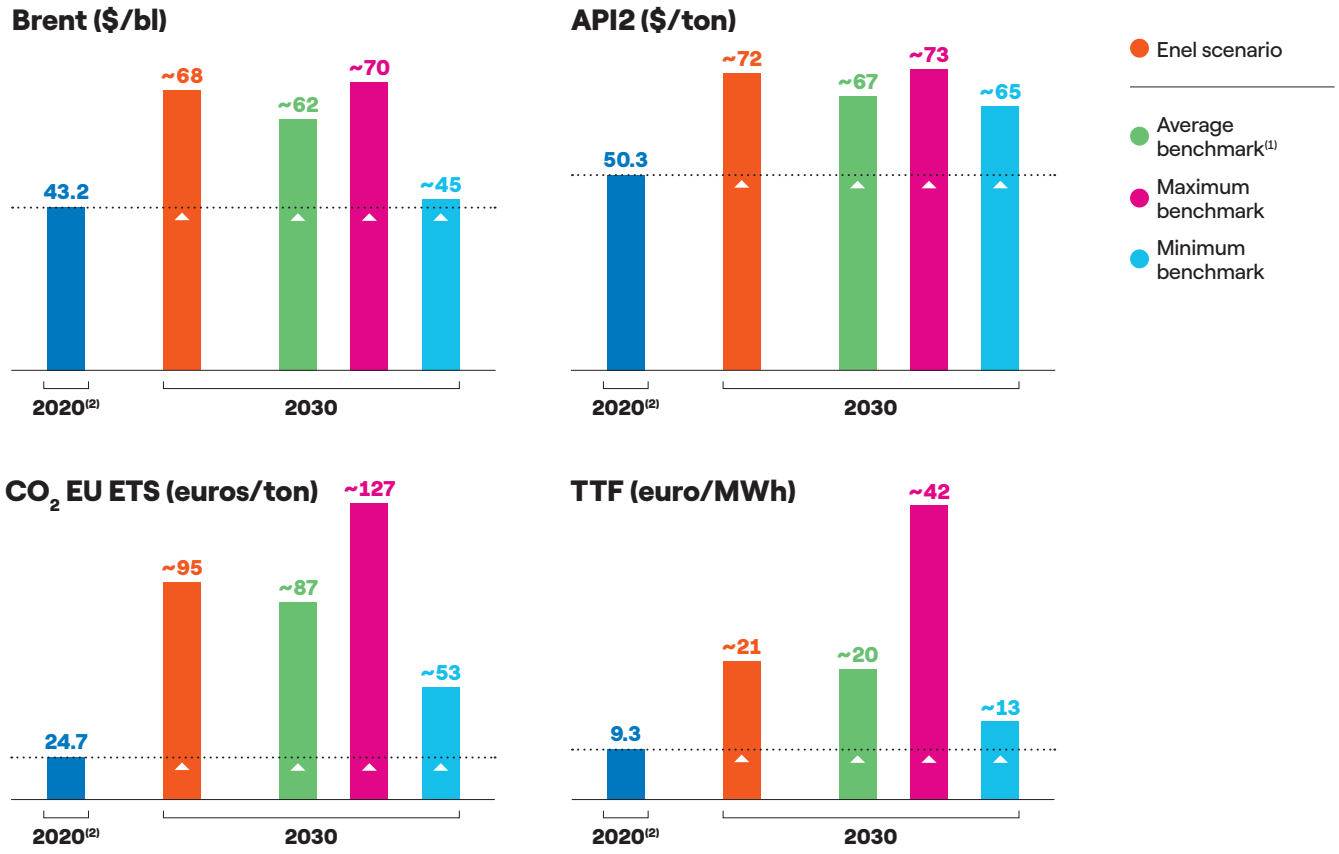
(4) As regards IIASA, for example, consideration was given to the fundamentals driving the commodity demand underlying the "Shared Socioeconomic Pathways (SSPs)", in which different scenarios are projected that describe socioeconomic and policy evolution in line with the climate scenarios. The information deriving from the "SSPs" is used, together with internal models, to support the long-term forecasts, such as, for example, those for commodity prices and electric demand.

sumptions for improvement over the Paris scenario. The objectives of the Paris Agreement are also achieved in this scenario, but a wider range of technological options is considered, i.e. a greater penetration of green hydrogen generated through renewable electricity, used more widely in hard-to-abate sectors, and facilitating the process of decarbonization towards Net-Zero emissions.

Enel has chosen the Paris scenario as a benchmark for long-term planning, which envisages the achievement of the objectives of the Paris Agreement, unlike last year, when the reference scenario was current policies. This is with the conviction that, globally speaking, governments, businesses, organizations and citizens will effectively participate in the collective effort to mitigate greenhouse gas emissions. The increase in the Net-Zero commitments of States during 2021, which currently cover 88% of global emissions(5), and the outcome of COP 26, support the choice of choosing a scenario that achieves the Paris objectives as a long-term benchmark for Enel. With respect to the possibility of assuming the achievement of the most challenging objective of the Paris Agreement as a benchmark scenario for long-term planning, i.e. to stabilize the average global temperature within +1.5 °C, there remains the uncertainty that some countries could maintain inertial trajectories, delaying the process of decarbonization towards Net-Zero emissions by 2050.

Having said this with respect to the external context, the Enel Group operates a business model in line with the maximum ambition of Paris Agreement objectives, namely, one that is consistent with a global average temperature increase of 1.5 °C by 2100. Enel has set a long-term goal to achieve zero direct emissions (Scope 1), with fully renewable electricity generation, and zero emissions related to retail sales of power (Scope 3).

Assumptions concerning commodity price trends as inputs to the Paris scenario are consistent with external scenarios that achieve Paris Agreement targets. In particular, a sustained growth in the price of CO_2, caused by the gradual reduction of permit supply in the face of increasing demand, and a stabilization of coal prices, due to decreasing demand, are considered in 2030. With regard to gas, it is believed that price tensions will ease in the coming years in light of a realignment between supply and demand at a global level. Finally, oil prices are expected to stabilize gradually, for which we estimate peak demand around 2030.



(1) Source: IEA – Sustainable Development Scenario and Net Zero Scenario, BNEF, IHS Green Case Scenario, Enerdata Green Scenario. N.B. the scenarios used as benchmarks were published at different times during the year and may not be updated to include the latest market dynamics.
(2) Actual.

(5) At December 28, 2021.

The physical climate scenario

Among the climatic projections developed by the "Intergovernmental Panel on Climate Change" (IPCC) on a global scale, **the Group has chosen three, characterized by a specific emissions level** connected to the "Representative Concentration Pathway" (RCP).

Scenario	Average temperature increase in comparison to pre-industrial levels (1850-1900)
RCP 2.6	**+1.5 °C by 2100** (the IPCC projects approximately +1.8 °C in on average with a 78% probability of remaining below +2 °C)[6]. The Group uses this scenario for the assessment of physical phenomena and for the analyses that consider an energy transition coherent with ambitious objects in terms of mitigation. In analyses that consider both physical and transition variables, the Group associates the SSP1-RCP 2.6 scenario with the Paris and Best Place scenarios.
RCP 4.5	**+2.7 °C by 2100**. Enel has identified this scenario as the one that is best suited for representing the current global climatic and political context and is coherent with the overall estimates of temperature increase that current policies consider and as announced on a global level[7]. In analyses that consider both physical and transition variables, the Group associates the SSP2-RCP 4.5 scenario with the Slow Transition scenario.
RCP 8.5	**+4.4 °C by 2100**. Compatible with a worst case scenario where no particular measures are taken to combat climate change ("Business as usual").

The climate scenarios are global in nature. Accordingly, in order to determine the effects in the areas of relevance for the Group, as previously described, a collaborative initiative has been started with the Department of Geosciences of the International Centre for Theoretical Physics (ICTP) in Trieste. As part of this collaboration, the ICTP provides projections for the main climate variables with a grid resolution that varies from approximately 12 km^2 to approximately 100 km^2 and a forecast horizon of 2020-2050. The main variables are temperature, rainfall and snowfall and solar radiation. With respect to previous analysis carried, the current studies are based on the use of multiple regional climate models: the one developed by ITP combined with five other simulations, selected as representative of the ensemble of climate models currently available in the literature. This technique is usually adopted in the scientific community to obtain a more robust, bias-free analysis mediated by the various assumptions that could characterize the single model.

In this phase of the study, **the future projections were analyzed for Italy, Spain and all countries of interest to the Group in Latin America, obtaining, also due to the use of the ensemble of models, a more definite representation of the physical scenario**. In addition, and in a similar manner, the Group is also analyzing climate projection data for North America.

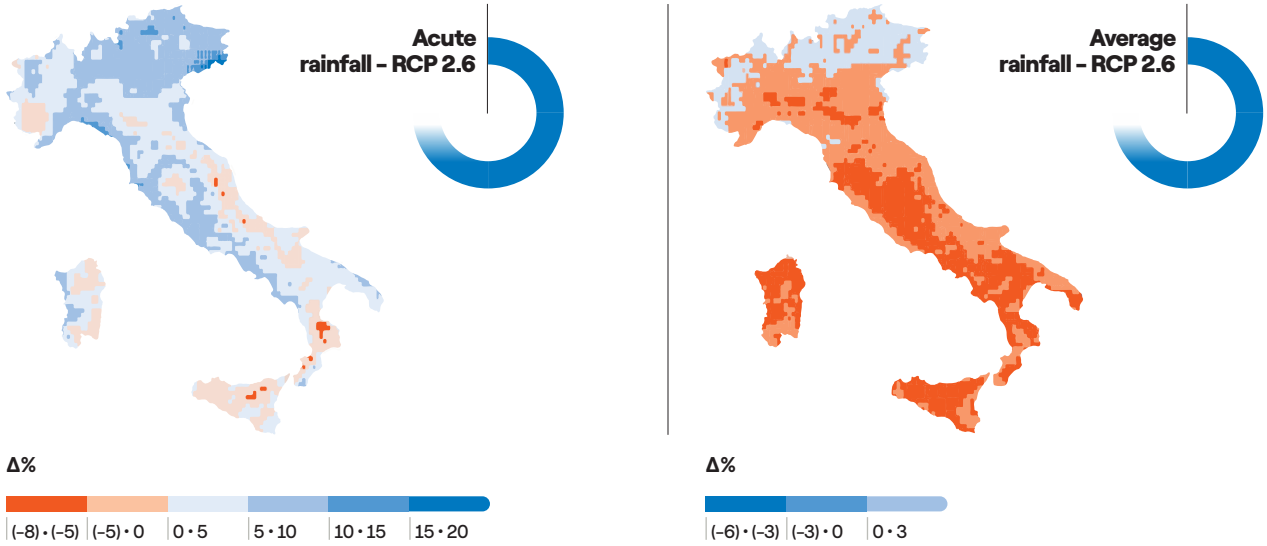
The analyses performed on the physical scenarios considered both chronic phenomena and acute phenomena. Some of these phenomena require an additional level of complexity, as they do not only depend on climatic trends but also on the specific characteristics of the territory, and require an additional modelling activity for their high-resolution representation. For this reason, in addition to the climate scenarios provided by ICTP, the Group also uses Natural Hazard maps, which make it possible to obtain, with a high spatial resolution, the return times of a series of events, such as storms, hurricanes and floods. The use of these maps, as described in the section "Risks and strategic opportunities related to climate change", is widely consolidated in the Group, which already uses this data based on a historical perspective to optimize the insurance strategies. Furthermore, work is under way in order to be able to use this information also when processed in compliance with the projections of the climate scenarios.

Italy

Acute phenomena: for Italy, the acute rainfall phenomenon was analyzed first, studying the variation of daily rainfall above the 95th percentile, calculated as average annual millimeters in the periods of reference. As shown in the figure below on the left, comparison of the period 2030-2050 with the historical period 1990-2020, in the RCP 2.6 scenario, suggests heavy rainfall will increase primarily in the north-east and along the Tyrrhenian coast significantly. Interestingly, again in RCP 2.6, this general increase in extreme rainfall is accompanied by a slight decrease in the annual sum of daily precipitation excluding acute rainfall (figure on the right). The same dichotomy between intense and average rainfall can also be observed in the other scenarios (RCP 4.5 and 8.5).

(6) IPCC Fifth Assessment Report, Working Group 1, "Long-term Climate Change: Projections, Commitments and Irreversibility".
(7) Climate Action Tracker Thermometer, global warming estimates for 2100 considering the current "Policies & Action" and "2030 Targets Only" (updated as of November 2021).

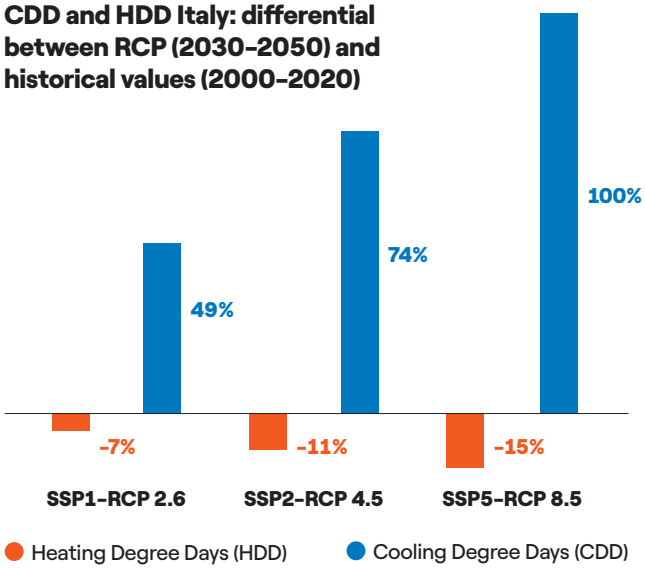
Acute rainfall and average rainfall (i.e., total rainfall net of acute rainfall): difference between RCP 2.6 (2030-2050) and historical values (2000-2020)



As already shown in the analyses previously published by the Group, heat waves and fire risk will also undergo important variations, both of which increase in the various climate scenarios considered. In particular, fire risk is described through the Fire Weather Index (FWI), a widely used indicator at international level that takes into account temperature, humidity, rain and wind in order to estimate a fire risk index. The data provided by the FWI can be useful in characterizing fire risk trends to support the business in managing it properly. The studies conducted, which examine the change in projections to 2030-2050 compared to 1990-2010, show that in all scenarios there is an increase in the number of high-risk days (index value > 45) in the summer season. This change mainly affects the islands and the southern regions of the country, where the increase in extreme risk days ranges from about +6 to +8 days compared to the historical period.

Chronic phenomena: chronic changes in temperature can be analyzed to obtain information on the potential effects on cooling and heating demand in local energy systems. Similar to what was done in 2020, Heating Degree Days (HDD) were used to measure heating requirements This is the sum, extended to all days of the year with $T_{average} \leq$ 15 °C, of the differences between the indoor temperature (T_{indoor} assumed as 18 °C) and the average temperature, and the Cooling Degree Days (CDD), which is the sum, extended to all days of the year with $T_{average} \geq$ 24 °C, of the differences between the $T_{average}$ and T_{indoor} (assumed as 21 °C), respectively for heating and cooling requirements. The analysis for Italy was refined both by increasing the number of models considered from 3 to 6, and by increasing the resolution of the data from about 50 km x 50 km to about 12 km x 12 km. Average country data were averaged over the nation, weighting each geographic node by population through the use of Shared Socioeconomic Pathways (SSPs) associated with each RCP scenario. A reduction in heating demand is predicted over the 2030-2050 period from 7 to 15% compared to the 2000-2020 period in the different scenarios, while CDDs are consistently higher than over the historical period, with an increasing trend from the RCP 2.6 (+~50%) to the RCP 8.5 (+~100%) scenario.

CDD and HDD Italy: differential between RCP (2030-2050) and historical values (2000-2020)

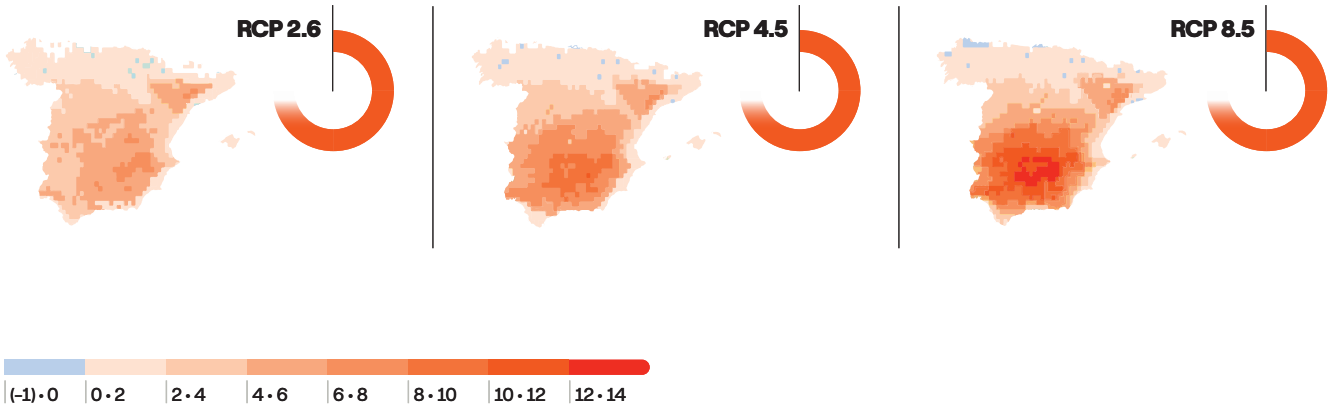


With regard to rainfall, variations in the basins of interest for the Group's hydroelectric generation were analyzed. From a preliminary analysis, no significant changes should emerge, with a general trend of slight decrease in Southern Italy and slight increase in Northern Italy in the RCP 2.6 and RCP 4.5 scenarios.

Spain

Acute phenomena: as far as fire risk is concerned, the number of days at extreme risk (i.e. with Fire Weather Index > 45) is higher in the RCP 8.5 scenario than in the RCP 2.6 scenario, and always increasing compared to the historical average. In particular, the area of Spain that will see the greatest increase in the average number of days per year in the summer season characterized by high fire risk is the centre-south, in all future scenarios.

Increase in average number of days of high fire risk per year in summer under the various RCP scenarios compared with historical values (2000-2020)

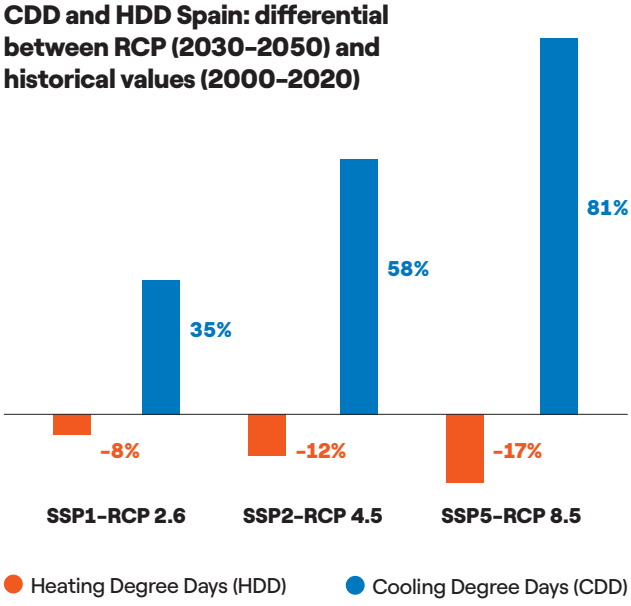


Heat waves, as already highlighted in the analyses published previously by the Group, will be more geographically widespread and more frequent in the period 2030-2050, especially in the southern part of the country.
Finally, extreme precipitation will undergo variations in frequency in most of Spain. Taking into consideration the annual average millimeters related to rainy days with intensity greater than the ninety-fifth percentile, a preliminary analysis shows a reduction in some areas in the south of the country already in the RCP 2.6 scenario.

Chronic phenomena: analysis of potential cooling and heating demand has been refined and updated in a similar way to that for Italy. In terms of Heating Degree Days (HDD) and Cooling Degree Days (CDD), compared to the period 1990-2020, HDDs are estimated to decrease in all scenarios in the period 2030-2050, from -8% in RCP 2.6 to -17% in RCP 8.5. The data also confirm an increase in CDDs (+35%) in the RCP 2.6 scenario and a change of +58% and +81% in the RCP 4.5 and RCP 8.5 scenarios, respectively.

With regard to rainfall, variations in the basins of interest for the Group's hydroelectric generation were analyzed. Comparing the period 2030-2050 with the period 1990-2009, data from a preliminary analysis do not show appreciable variations, with a general trend of slight decrease in southern Spain in all scenarios.

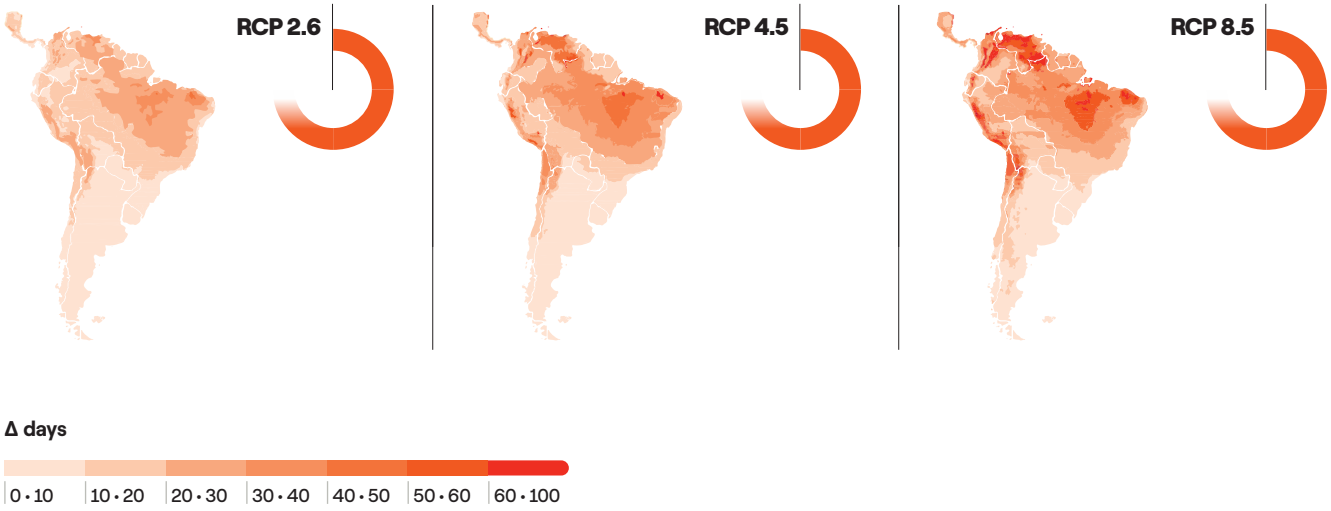
CDD and HDD Spain: differential between RCP (2030-2050) and historical values (2000-2020)



Latin America

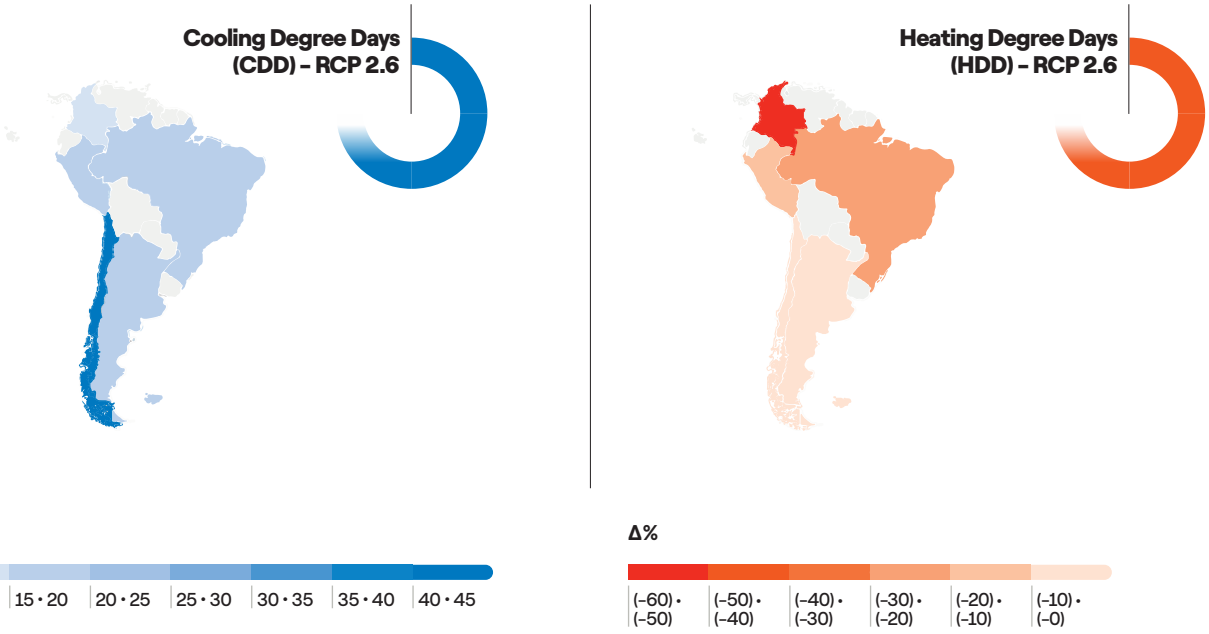
Acute phenomena: in exceptionally large countries such as Brazil, acute phenomena can show significantly different trends in the various areas. In order to have an overview of the entire continent and identify the areas of greatest interest for further study, some acute phenomena have been analyzed using standard metrics. Analyses were conducted by processing data from an ensemble of 6 climate models with a spatial resolution of 25 km x 25 km.
In order to study the phenomenon of extreme temperatures, the "Warm Spell Duration Index" (WSDI) was used, which considers heat waves characterized by at least 6 consecutive days with a maximum daily temperature above the 90th percentile. Comparing the period 2030-2050 with the period 1990-2020, the data show a significant increase in days characterized by heat waves already in the RCP 2.6 scenario, especially in some areas of Brazil, Colombia, Peru and northern Chile. This increase in extreme temperatures will be even more pronounced in the other scenarios, especially RCP 8.5.
For extreme precipitation, daily rainfall above the 95th percentile was considered, similar to what was done for Italy and Spain. Future changes for this phenomenon are less homogeneous. In the RCP 2.6 scenario, in some areas, such as northern Brazil and northern Argentina, reductions are projected, while in other areas, such as western Colombia and some areas of Brazil and Peru, increases in extreme rainfall are expected.

Warm Spell Duration Index (heat stress): difference between RCP (2030-2050) and historical values (2000-2020)



Chronic phenomena: for the main countries where Enel is present, a study was carried out on potential changes in heating and cooling demand related to chronic changes in temperature. Again, changes in Heating Degree Days (HDD) and Cooling Degree Days (CDD) over the period 2030-2050, compared to the period 1990-2020, were calculated from data from 6 models, with a resolution of 25 km x 25 km. Average country data were averaged over the nation, weighting each geographic node by population through the use of Shared Socioeconomic Pathways (SSPs) associated with each RCP scenario. In each country studied, CDDs increase progressively in all scenarios: in the RCP 2.6 scenario they increase by 42% in Chile, while the increase is between 14% and 19% in the other countries examined. In the RCP 4.5 scenario, this increase becomes 108% for Chile and slightly more than 25% for Argentina, Brazil and Peru, while it stands at 20% for Colombia. The increase in CDDs with respect to the historical period is even more marked in the RCP 8.5 scenario. With regard to HDDs, in the RCP 2.6 scenario considerable reductions are estimated in Colombia (-51%), Brazil (-21%) and Peru (-15%). This trend intensifies in the RCP 4.5 scenario: ~-61% in Colombia, ~-28% in Brazil, and ~-20% in Peru.

CDDs and HDDs in the countries of interest to the Group: difference between RCP 2.6 and historical values (2000-2020)



With regard to rainfall, variations in the basins of interest for the Group's hydroelectric generation were analyzed. Initial analyses comparing 2030-2050 projections in the three scenarios to the historical period 1990-2009 show a predominant trend of chronic rainfall reductions. The most significant average decreases are projected in Chile and Colombia, with values just below 10%. A closer look at the average data in Chile shows that in the basins considered, the expected rainfall in the period 2030-2050 is in line with that already experienced in the last decade (2010-2019). These data highlight how climate change is already being experienced in these basins compared to the historical period taken as a benchmark.

The strategy to tackle climate change

102-15 | 103-2 | 103-3 | 201-2

The sustainable strategy developed in recent years and the integrated business model have allowed the Group to create value for all stakeholders, benefiting from the opportunities that emerge from the energy transition and from climate action. In this context, capital employment is centered on decarbonization through the development of assets for generation from renewable sources, on enabling infrastructure linked to the development of networks, and on the adoption of platform models, fully exploiting technological and digital evolution which will favor consumption electrification and the development of new services for end customers. The aim is to accelerate the decarbonization and electrification processes to allow the global warming containment goals to be achieved in accordance with the Paris Agreement.

In the last decade, thanks to cost reductions renewables have become the dominant trend in power generation, allowing decarbonization to proceed at a faster pace. It has been a decade of profound changes in the power generation mix, destined to continue at an ever increasing speed. The next decade will be crucial to achieving the goals set in 2015 by the Paris Agreement. At the same time, this period will also be characterized by increasing support for electrification, through which customers gradually convert their energy consumption to the electricity carrier, with ensuing improvements in spending, efficiency, emissions and price stability.

In order to benefit fully from all the opportunities emerging from the market in which it operates, the Group has identified two different business models, Ownership and Stewardship, on which it can rely to achieve the defined ambitions. The most appropriate and effective business model is identified according to the countries and regions of interest and the context of operations:

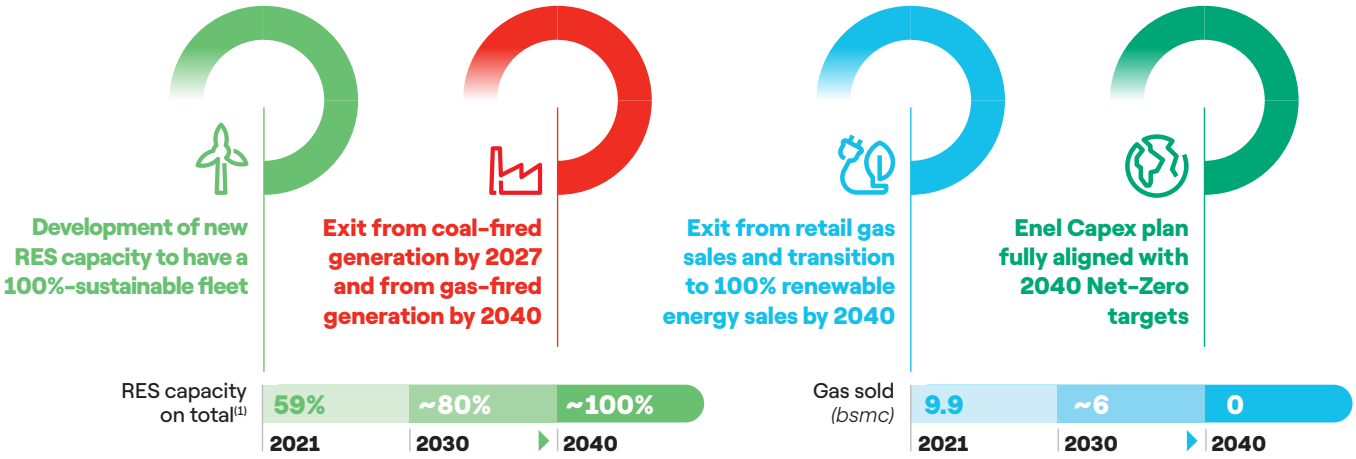
- the **Ownership business model**, in which the Group makes direct investments in renewables, networks and customers. This model is used when operating in countries where it can already leverage the entire value chain, from generation to integration with end customers. These countries are defined as "Tier 1", and include Italy, Spain and Romania in Europe and the USA, Brazil, Chile, Colombia and Peru in the Americas;
- the **Stewardship business model**, in which the Group invests capital in existing or newly established joint ventures or by acquiring minority shareholdings, in order to maximize the value of the know-how developed in the various businesses where it is present. This is done through the activation of specific contractual services

towards the partners or also through the subsequent valuation of these shares of the assets on the market. This model focuses mainly, but not exclusively, on "non Tier 1" countries, where the Group's presence is not integrated, and attempts are made to build partnerships with third parties to explore new countries and regions or to enhance the Group's operating experience in alternative contexts.

The strategy defined and the Group's positioning make it possible to affirm the commitment to anticipate the "Net-Zero" path by 10 years, from 2050 to 2040, for both direct and indirect emissions. Enel is committed to achieving a value of zero emissions, with no use of any carbon removal technology or nature-based solutions, in relation to the generation of energy and the sales of electricity and natural gas to end customers.

A pathway based on the implementation of certain fundamental strategic stages:

- **accelerate the process of decarbonization of generation activities, gradually replacing the thermoelectric portfolio with new renewable capacity, as well as making use of the hybridization of renewables with storage solutions;**
- **by 2040, generate 100% of the electricity sold by the Group from renewable sources and by the same year to exit the gas retail business.**



(1) Including 3.3 GW of managed renewable capacity.

2030 vision

Enel plans to **put together 210 billion euros between 2021 and 2030.** Of this amount, the Group plans to invest around 170 billion euros directly (up 6% on the previous Plan) through the Ownership (160 billion euros, primarily in Tier 1 countries) and Stewardship (10 billion euros) business models, with a further 40 billion euros catalyzed by the latter through third parties.

The **approximately 160 billion euros through the Ownership business model**, primarily in Tier 1 countries, will be dedicated:

- **to Renewables, almost half (around 70 billion euros)**, for which an increase of around 84 GW of capacity is expected, compared to 2020, of which 9 GW of storage, bringing the installed renewable capacity at consolidated level to 129 GW by 2030 and thus reaching 80% of the total installed capacity. This should be achieved by leveraging a growing pipeline of approximately 370 GW and more than doubling the one presented last year, together with three global platforms for Business Development, Engineering and Construction and Operation and Maintenance activities. These investments will make it possible to reach 80% of electricity generation from renewable sources in 2030;
- **a further investment of around 70 billion euros in the Infrastructure and Networks business**, up by 10 billion euros compared to the previous Plan and concentrated in Europe, with the aim of strengthening the Group's position as a global operator in terms of size, quality, efficiency and resilience. This investment is expected to lead to a RAB ("Regulatory Asset Base") of 65 billion euros in 2030, along with the complete digitalization of the entire network customer base through smart meters. The development of the Group's activities in this area will benefit from the adoption of "Grid Blue Sky", a digital platform for managing grid portfolio assets as part of a unified global model that places the customer at the center of the value chain.

This capital allocation is expected to accelerate achieve-

ment of the Group's electrification and decarbonization goals. **By 2030, the Enel Group expects to achieve a total managed renewable capacity of around 154 GW**, tripling its portfolio at 2020, as well as to **increase the network customer base by 12 million and promote the electrification of energy consumption**, increasing the volumes of electricity sold by almost 30% while focusing on the development of "beyond commodity" services, such as the enhancement of the charging network for electric mobility or those related to behind-the-meter storage and electric buses, in collaboration with a number of partners.

2022-2024 Strategic Plan

During 2022-2024, Enel plans to **invest directly approximately 45 billion euros**, of which 43 billion euros through the Ownership business model, mainly in the growth of grids and renewables, and approximately 2 billion euros under the Stewardship model, through capital injections acquisitions of minority interests, while at the same time putting together 8 billion euros from third parties.
Of the Group's total investments planned under the Ownership and Stewardship models for 2022-2024, it is expected that:

- **approximately 19 billion euros will be destined for Renewables**, particularly in countries where the Group benefits from an integrated business with end customers. The Group's total renewable capacity is expected to increase to 77 GW from the 53 GW installed at the end of 2021. As a result, zero-emission generation is estimated to reach 77% in 2024 and CO_2 emissions per kWh are expected to fall by more than 35% over the same period compared to 2021, positioning the Group towards achieving its "Net-Zero" targets on schedule;
- **around 18 billion euros** will be destined for the **Infrastructure and Networks** business, up 12% on the previous Plan, as a result of increased investments in Europe, which are also expected to leverage the opportunities created by the National Recovery and Resilience Plans launched in the EU. As a result of these investments, which aim to improve network quality and resilience levels even further, the Group's RAB is estimated to reach 49 billion euros, up nearly 14% from 2021.

At Group level, ordinary EBITDA is expected to grow by 11% from 19.2 billion euros in 2021 to a figure of between 21.0 billion euros and 21.6 billion euros in 2024.
The following factors are expected to contribute to the growth of the Group's ordinary EBITDA:

- growth in Renewables is the main driver for the period, with an expected contribution of approximately 2.0 billion euros, out of a total contribution from the generation business of 2.9 billion euros. The evolution of the generation portfolio is expected to result in a 45% growth in Enel Green Power's EBITDA[8] over the Plan period, specifically from 6.0 billion euros in 2021 to 8.7 billion euros in 2024;
- EBITDA for the Customers business is expected to grow by approximately 40% over the Plan period, reaching 4.9 billion euros in 2024 from 3.4 billion euros in 2021. This growth is driven by the Group's initiatives for an integrated strategy at commercial and generation capacity level, the contribution of electricity volumes in the free market and incremental needs for additional services;
- EBITDA in the Infrastructure and Networks business is expected to increase by 16% from 7.7 billion euros in 2021 to 8.7 billion euros in 2024. The main growth drivers are the increase in RAB, driven by higher investments, efficiency programs, tariff increases due to indexing to inflation, especially in Latin America, and the increase in distributed energy volumes.

The investments connected to the decarbonization of the generation mix, together with those connected to digitalization and increasing the efficiency of the distribution grid, as well as the offer of new services for promoting the electrification of consumption (such as electric mobility services or demand response), will contribute toward combating climate change (SDG 13). Enel expects in fact that approximately 94% of the consolidated investments during 2022-24 will directly contribute toward this goal. Furthermore, it is estimated that these investments will be aligned with the criteria of EU Taxonomy, with a percentage in excess of 85%, considering the substantial contribution toward the mitigation of climate change.

(8) Including conventional generation business activities.

Main risks and opportunities connected with climate change

102-15 | 103-2 | 103-3 | 201-2

The process of defining the Group's strategy is accompanied by a careful analysis of the risks and opportunities connected to it, also including the aspects related to climate change. Every year, before the Board of Directors examines the Strategic Plan, the Control and Risk Committee is presented with a quantitative analysis of the risks and opportunities related to the Group's strategic positioning, which includes aspects related to the climate, such as regulatory factors and weather and climate phenomena.

In order to identify the main types of risk and opportunity and their impact on the business associated with them in a structured manner consistent with the TCFD, we have adopted a **framework** that explicitly represents the main relationships between scenario variables and types of risk and opportunity, specifying the strategic and operational approaches to managing them, comprising mitigation and adaptation measures. Two main macro-categories of risks/opportunities are identified:

- those connected with developments in physical variables;
- those connected to the evolution of the transition scenarios.

The framework described is achieved in a perspective of overall consistent, which makes it possible to analyze and evaluate the impact of the physical and transition phenomena according to solid, alternative scenarios that were created using a quantitative and model-based approach in combination with continuous dialog both with internal stakeholders and with authoritative external references.

The framework also highlights the relationships that link the physical and transition scenarios with the potential impact on the Group's business. These effects can be assessed over three time horizons: the short-medium term (1-3 years), in which sensitivity analyses based on the Strategic Plan presented to investors in 2021 can be performed; medium-term (until 2029), in which it is possible to assess the effects of the energy transition; and long-term (2030-2050), in which chronic structural changes in the climate should begin to emerge.

Framework of main risks and opportunities

Scenario phenomena	Time horizon	Risk & opportunity category	Description	Impact	Management approach
Acute physical	Starting with short term (1-3 years)	Extreme events	**Risk:** especially extreme weather/climate events.	Extreme events can damage assets and interrupt operations.	The Group adopts best practices to manage the restoration of service as quickly as possible. We also work to implement investments in resilience (e.g., the Italian case). With regard to risk assessment in insurance, the Group has a loss prevention program for property risk that also assesses the main exposures to natural events, supported by preventive maintenance activities and internal risk management policies. Looking forward, the assessments will also include the potential impacts of long-term trends in the most significant climate variables.
Chronic physical	Starting with long term (2030-2050)	Market	**Risk/opportunity:** increase or decrease in electricity demand; increase or decrease in output.	Electricity demand is also affected by temperature, whose fluctuation can impact our business. Renewables generation can also be impacted by structural changes in resource availability.	The Group's geographical and technological **diversification** means that the impact of changes (positive and negative) in a single variable is mitigated at the global level. In order to ensure that operations always take account of weather and climate phenomena, the Group adopts a range of **practices** such as, for example, weather forecasting, real-time monitoring of plants and long-term climate scenarios to identify any chronic changes in renewable source availability.

Scenario phenomena	Time horizon	Risk & opportunity category	Description	Impact	Management approach
Transition	Starting with short term (1-3 years)	Policy & Regulation	**Risk/opportunity:** policies on CO_2 prices and emissions, energy transition incentives, greater scope for investment in renewables and resilience.	Policies concerning the energy transition and resilience can impact the volume of and returns on investments.	The Group is minimizing its exposure to risks through the progressive **decarbonization** of its generation fleet. The Group's strategic actions, which are focused on investment in renewables, grids and customers, enable us to mitigate potential threats and exploit the opportunities connected with the energy transition. The Group is also actively contributing to the formation of public policies through its advocacy efforts. These activities are conducted within platforms for dialogue with stakeholders called "Energy Transition Roadmaps" that explore national decarbonization scenarios in the various countries in which Enel operates in environmental, economic and social terms.
Transition	Starting with medium term (2025-2029)	Market	**Risk/opportunity**: changes in the prices of commodities and energy, evolution of energy mix, changes in retail consumption, changes in competitive environment.	Considering two alternative transition scenarios, the Group assesses the impact of rising trends in the proportion of renewable sources in the energy mix and the electrification of final energy consumption.	The Group is maximizing opportunities by adopting a strategy founded on the energy transition, **the electrification of energy consumption and rapid growth in renewables output**.
Transition	Starting with medium term (2025-2029)	Product & Services	**Opportunity**: increase in margins and greater scope for **investment** as a consequence of the transition in terms of greater penetration of electrical transport and new technologies for the electrification and energy efficiency of final consumption.	Considering two alternative transition scenarios, the Group assesses the impact of different trends in the electrification of energy consumption.	The Group is maximizing opportunities thanks to its strong positioning in **new businesses and "beyond commodity" services**.
	Starting with medium term (2025-2029)	Technology		With the current trend in the penetration of electrification efficiency technologies, the Group considers two alternative transition scenarios to assess opportunities to scale up current businesses.	The Group is maximizing opportunities thanks to its **strong positioning** in global networks.

In order to facilitate the proper identification and management of risks and opportunities related to climate change, a **Group policy** was published in 2021 that describes common guidelines for assessing these risks and opportunities. The "Climate change risks and opportunities" policy defines a shared approach for the integration of climate change and energy transition issues into the Group's processes and activities, thus informing industrial and strategic choices to improve business resilience and long-term sustainable value creation, consistent with the adaptation and mitigation strategy. The main steps considered in the policy are as follows:

- **Prioritizing of phenomena and scenario analysis**. These activities include the identification of physical and transition phenomena relevant to the Group and the consequent development of scenarios to be considered and developed through analysis and processing of data from internal and external sources. Functions can be developed for the phenomena identified that link the scenarios (e.g. data on the change in renewable resources) to business operations (e.g. the change in potential output);
- **impact assessment**. Includes all analyses and activities necessary to quantify the effects at the operational, economic and financial levels, depending on the processes into which these are integrated (e.g. design of new constructions, evaluation of operational performances, etc.);
- **operational and strategic actions**. Information from previous activities is integrated into processes, informing Group decisions and business activities. Examples of activities and processes that benefit are capital allocation, e.g. for evaluating investments on existing assets or new projects; defining resilience plans, risk management and financing activities and Engineering and Business Development activities.

The following will describe the main sources of risks and opportunities identified, operational best practices for managing weather and climate phenomena, and qualitative and quantitative impact assessments conducted to

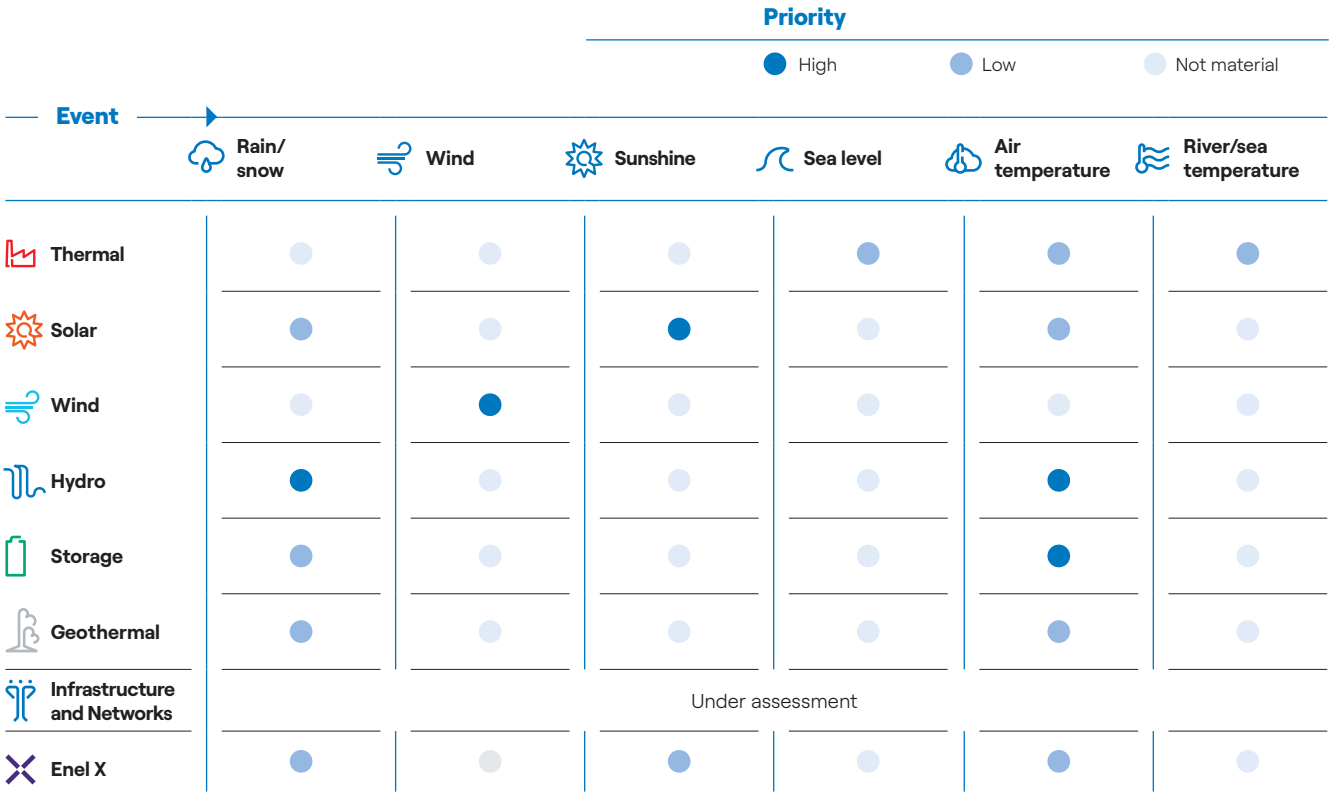
date. All of the above activities are performed throughout the year through an ongoing effort to analyze, evaluate and manage the information processed. As TCFD states, the process of disclosing risks and opportunities related to climate change will be gradual and incremental from year to year.

Identification, assessment and management of risks and opportunities related to physical phenomena

Chronic physical risks: the main impacts of chronic physical changes can produce similar effects on the following variables:

- **electricity demand**: variation in the average temperature level with a potential increase or reduction in electricity demand;
- **thermal generation**: variation in the level and average temperatures of the oceans and rivers, with effects on thermal generation;
- **hydroelectric generation**: variation in the average level of rainfall and snowfall and temperatures with a potential increase and/or reduction in hydroelectric generation;
- **solar generation**: variation in the average level of solar radiation, temperature and rainfall with a potential increase or reduction in solar generation;
- **wind generation**: variation in the average wind level with a potential increase or reduction in wind generation.

The Group will work to estimate the relationships between changes in physical variables and the change in the potential output of individual plants in the different categories of generation technology.
As part of the assessment of the effects of long-term climate change, chronic events relevant to each technology were identified and analyses of their impacts on manufacturability were initiated.



The initial scenario analysis has shown that chronic structural changes in the recent trends of physical variables will begin to occur in a considerable manner starting from 2030. However, in order to obtain an indicative estimate of the potential impacts, and include the possibility of the early onset of chronic effects, it is possible to test sensitivity of the Industrial Plan to the factors potentially influenced by the physical scenario, regardless of any direct relationship with climate variables. Of course, such stress testing has an extremely low probability of occurrence based on historical events and geographical diversification. The variables examined were: electricity demand (+/- 1% per year), whose variations can potentially impact the generation and retail businesses. It was stress tested for all countries in which the Group operates; the output potential of renewables plants was also stressed (+/- 10% over a single year). Variations in this variable can potentially impact the generation business. It was stressed separately at the individual technology level around the globe. The data reported show the effect on a single year for a single generation technology and include both the volume and price effects.

Time horizon
Short (within 3 years)
Medium (until 2030)
Long (2030-2050)

Downside scenario current policies ▼ ● Upside scenario current policies ▲ ●

Scenario phenomena	Risk & opportunity category	Description	Time horizon	Impact	GBL affected	Scope	Quantification - Type of impact	Upside/ Downside	Quantification - range <€100 mn	€100-300 mn	>€300 mn
Chronic physical	Market	**Risk/ opportunity:** increased or decreased power demand.	Short	Electricity demand is also influenced by temperature, the fluctuations of which can have an impact on the business. Although structural changes should not occur in the short-medium term, to assess the sensitivity of the Group's performance to potential temperature changes, sensitivity analyses are conducted with respect to changes in electricity demand of +/- 1% of the Group total.	Enel Green Power and Thermal Generation and Infrastructure and Networks	Group	EBITDA/year	+1% ▲	●		
								-1% ▼			●
Chronic physical	Market	**Risk/ opportunity:** increased or decreased renewables output	Short	Renewables output is also influenced by the availability of resources whose fluctuations can have an impact on the business. Although structural changes should not occur in the short-medium term, to assess the sensitivity of the Group's performance to potential temperature changes, sensitivity analyses are conducted with respect to changes in potential output of +/- 10% per year by individual technology.	Enel Green Power and Thermal Generation	Group Potential Hydro Output	EBITDA/year	+10% ▲		●	
								-10% ▼		●	
						Group Potential Wind Output	EBITDA/year	+10% ▲	●		
								-10% ▼	●		
						Group Potential Solar Output	EBITDA/year	+10% ▲	●		
								-10% ▼	●		

Preliminary analysis of the impact of chronic climate change on renewable generation

Preliminary analyses were carried out to translate chronic climate change into impacts on manufacturability for the Group's main RES technologies: wind, solar and hydroelectric.
Two pilot sites were selected for each technology, based on country and region and availability of historical site data, for which a link function was calculated from the observed data to translate trends in climate variables into information on generation. This function was then applied to climate projection data to estimate the difference in potential output in 2030-2050 compared to the historical period.

We report below the results obtained from these initial analyses on the pilot sites.

	Pilot sites	Input parameters	Results
		**Climate variables used to calculate link function:** wind speed, air density **Time step:** monthly **Time horizon:** 2030-2050 vs. historical	**Site 1:** output in line with historical trend in RCP 2.6 scenario and down slightly in RCP 4.5 and RCP 8.5 scenarios **Site 2:** output stable in RCP 2.6 and RCP 4.5 scenarios and up slightly in RCP 8.5 scenario
		**Climate variables used to calculate link function:** Global Horizontal Irradiance (GHI), temperature **Time step:** daily **Time horizon:** 2030-2050 vs. historical	No material changes for the business at either of the plants examined
		**Climate variables used to calculate link function:** precipitation, temperature **Time step:** monthly **Time horizon:** 2030-2050 vs. historical	For both areas, average output is unchanged in RCP 2.6 scenario but declines slightly in RCP 8.5 scenario

Slight increase or slight decrease means a change that does not exceed +/- 5%.

Acute physical risks

With regard to acute physical phenomena (extreme events), their intensity and frequency can cause significant and unexpected physical damage to assets and generate negative externalities associated with the interruption of service.
Within the scope of scenarios regarding climate change, the acute physical component continues playing an extremely important role when defining the risks to which the Group is exposed, both due to the wide geographical diversification of its asset portfolio and due to the primary importance of the renewable natural resources for the generation of electricity.
In the various cases, the acute physical phenomena such as wind storms, floods, heat waves, severe cold, etc., demonstrate a high level of intensity yet do not have a very high occurrence frequency in the short term, but, considering the medium and long-term climatic scenarios, this will increase considerably in the future.
Hence, for the reasons described above, the Group is currently managing the risk deriving from extreme events in the short term. At the same time, it is extending its methodology also to longer time periods (until 2050) according to the identified climate change scenarios (RCP 8.5, 4.5 and 2.6).

Methodology for evaluating the risk of extreme events

In order to quantify the risk deriving from extreme events, the Group refers to a consolidated methodology for analyzing the catastrophic risk used in the insurance sector and in IPCC reports[9]. Through its own insurance business units and the captive insurance company Enel Insurance NV, the Group is managing the various phases connected to risks deriving from natural catastrophes: from the assessment and quantification to the corresponding coverages to minimize the impacts. The methodology applies to all extreme events that can be analyzed, such as wind storms, heat waves, tropical cyclones, floods, etc. In all of these types of natural catastrophes, however, three independent factors can be identified that are summarized below.

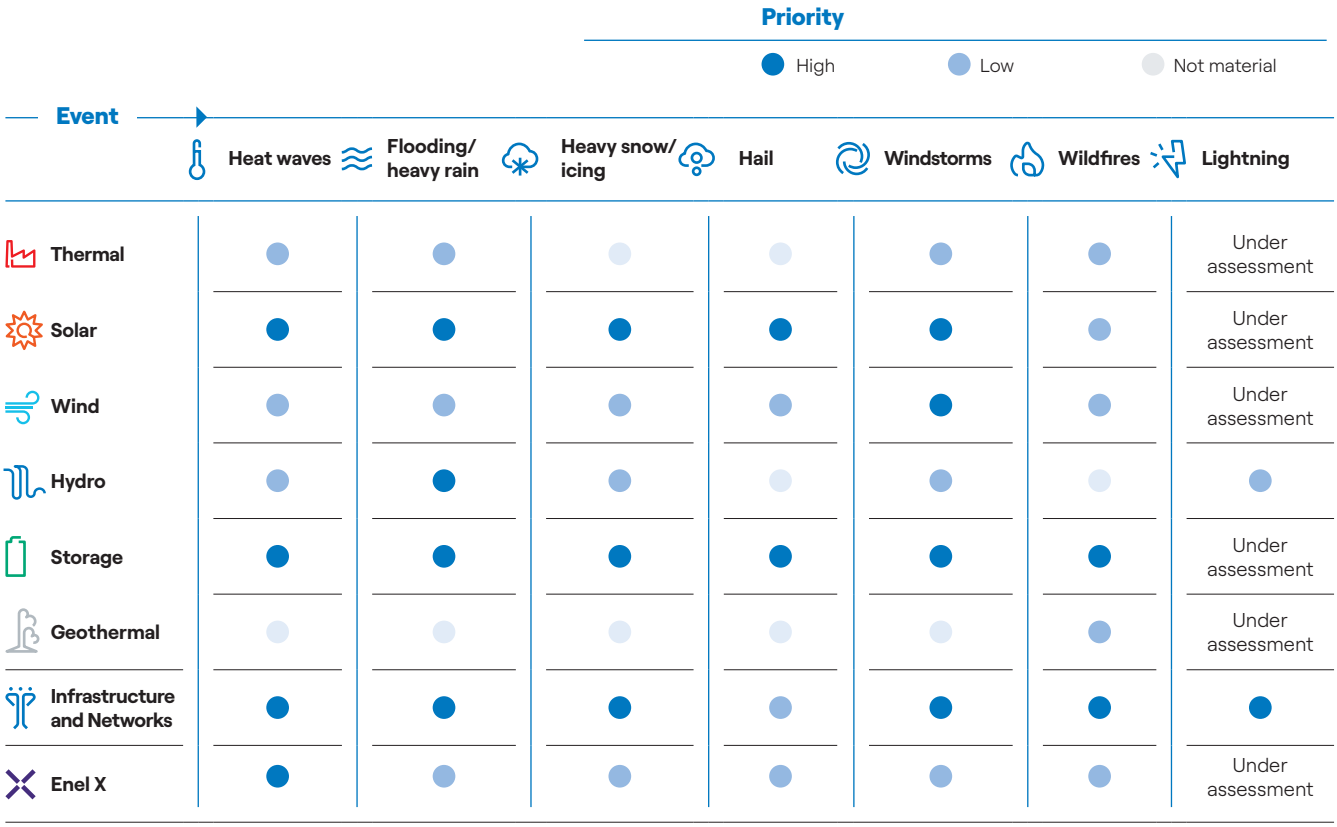
- **The probability of the event ("Hazard")**, that is, its theoretical frequency over a specific period of time: the "return time". In other words, a catastrophic event that has a return time of 250 years, for example, implies that it can be associated with a probability of 0.4% that it will occur in a year. This information, which is necessary for assessing the frequency of the event, is then associated with its geographical distribution with respect to the various areas where portfolio assets are located.
  For this purpose, the Group uses "hazard maps" which associate, for the various types of natural catastrophes, each geographical points on the global map with the corresponding estimate of the frequency associated with the extreme event. This information, which is organized in geo-referenced databases, can be provided by global reinsurance companies, meteorological consultancy companies or academic institutions.
- The **vulnerability**, that, in percentage terms, indicates how much value is lost and/or damaged upon occurrence of the catastrophic event. In more specific terms, therefore, it is possible to refer to the damage to the material assets the impact on the continuity of generation and/or distribution of electricity, and also the provision of the electric services offered to the end customer.
  The Group creates and promotes specific vulnerability analyses, especially in the case of damage to its assets, related to every technology in its portfolio: solar, wind, hydroelectric power plants, transmission and distribution grids, primary and secondary substations, etc. These analyses are then, of course, focused on the extreme events that have greater impact on the various types of technology: as a result, this defines a matrix that associates the individual natural catastrophic events with the corresponding type of asset that is impacted in a considerable manner.
- **The exposure**, which is the set of economic values in the Group portfolio that can be considerably impacted by the occurrence of natural catastrophic events. Also in this case, the scopes of the analyses are specific to the various generation technologies, for the generation assets and for the services to the end customer.

The combination of the three factors described above (**hazard**, **vulnerability** and **exposure**) provide the fundamental element for assessing the risk deriving from extreme events. From this point of view, the Group differentiates the risk analysis with respect to the climate change scenarios, depending on the specific nature of the various associated time periods. The following table summarizes the scheme adopted for the evaluation of impacts deriving from acute physical phenomena.

Time horizon	Hazards	Vulnerability	Exposure
Short term (1-3 years)	Hazard maps based on historical data and meteorological models	Vulnerability, being related to the type of extreme event, to the specifics of the damage type and to the technical requirements of the technology under consideration, Vulnerability is essentially independent of time horizons	Group values in the short term
Long term (at 2050 and/or 2100)	Hazard maps and specific studies for different IPCC RCP climate scenarios		Long-term evolution of Group values

(9) Wilson, L. "Industrial Safety and Risk Management". University of Alberta Press.
Bernold, T. "Industrial Risk Management". Elsevier Science Ltd.
Kumamoto, H. and Henley, E. J., 1996, Probabilistic Risk Assessment And Management For Engineers And Scientists, IEEE Press, ISBN 0-7803100-47.
Nasim Uddin, Alfredo H.S. Ang. (eds.), 2012, Quantitative risk assessment (QRA) for natural hazards, American Society of Civil Engineers CDRM Monograph no. 5.
UNISDR, 2011. Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development. United Nations International Strategy for Disaster Reduction. Geneva, Switzerland.
Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation - A Special Report of Working Groups I-II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA.

In the case of the vulnerability of assets within the portfolio, a table for the prioritization of the impacts of the main extreme events on the different technologies has been defined in collaboration with the Group's relevant Global Business Lines:



"Heavy/wet snow" includes icing, which is relevant for Infrastructure and Networks.

Management of risks from short-term extreme events

Over the short term (1-3 years) the Group, in addition to what was illustrated above in terms of risk assessment and quantification, will implement actions targeted toward reducing the impacts on business due to extreme catastrophic events. It is possible to distinguish two main types of actions: defining an effective insurance coverage and the various activities related to preventing damage that could result from extreme events.

The main components of these actions are described below and, in the case of activities related to preventing and mitigating the damage, specific reference is made to the Group's Generation and Infrastructure and Networks Global Business Lines.

Impacts of acute physical events on the Group

The Enel Group has a well-diversified portfolio in terms of technologies, country and regional distribution and asset size. Consequently, the exposure of the portfolio to natural risks is also diversified. The Group implements various risk mitigation measures which, as will be described below, include both insurance coverage and other managerial and operational actions aimed at further reducing the Company's risk profile.

Indeed, empirical evidence shows negligible repercussions of such risks, as demonstrated by data for the last 5 years. Considering the most relevant events, defined as those with a gross impact >10 million euros, the cumulative value of the gross impact amounts to ~270 million euros, which represents less than 0.14% of the Group's insured values as of 2022, or ~202 billion euros, most of which are recovered through insurance pay-outs.

Enel Group insurance

Every year, the Group defines global insurance programs for its business in the various countries where it operates. The two main programs, in terms of scope of coverage and volumes, are as follows:

- **the Property Program** for material damage that can be caused to the assets and the resulting interruption in business. Therefore, in addition to the cost for the new reconstruction of the asset (or its parts), also the economic losses due to their shutdown in terms of generation and/or distribution of electricity are also remunerated according to the limits and conditions defined in the policies;

- **the Liability Program**, which covers third party damage following the impacts that extreme events can have on the assets and on the Group's business.

Starting from an effective assessment of the risk, suitable limits and insurance conditions can be defined in the insurance policies and this also applies in the case of natural extreme events related to climate change. In fact, in this latter case, the impacts on business can be considerable but, as shown in cases that occurred in the past and in various areas around the world, the Group has shown absolute resilience thanks to the wide insurance coverage limits, which are also the result of a solid reinsurance structure, as regards the Group's captive company Enel Insurance NV.

Climate change adaptation activities in the Enel Group

The Group adopts solutions for adaptation to weather and climate events in order to manage effectively chronic and acute phenomena of interest for each activity and Business Line.
Adaptation solutions may concern both actions implemented in short-term and long-term decision making, such as the planning of investments in response to climate phenomena. Adaptation activities also include procedures, policies and best practices.

For new investments, action can also be taken early in the design and construction phase to reduce the impact of climate risks by through risk and vulnerability assessments at the design stage, and to take any chronic effects into account (e.g. the inclusion of climate scenarios in long-term renewable resource estimates).

Once the weather and climate phenomena of interest have been identified, activities carried out to maximize adaptive capacity can be classified as follows:

- prevention and management of adverse events: procedures to prepare in advance for extreme events (e.g. the acquisition of short-term weather forecast data and training) and procedures to restore normal activities in the shortest possible period of time (e.g. the establishment of operational and organizational procedures to be implemented in case of critical events);
- enhancement of asset resilience: activities and interventions aimed at increasing the resilience of assets, such as the quantitative assessment of potential acute and chronic risks to define better both requirements in the design phase and actions to be taken on existing assets.

The following table shows a high-level summary that represents the type of actions that Enel implements for proper management of adverse events and to increase resilience to weather phenomena and their evolution due to climate change. Several activities are described in greater detail below.

Business Lines	A. Prevention and management of adverse events	B. Enhancement of asset resilience
Enel Green Power and Thermal Generation	**Existing assets** 1 - Incident and critical event management 2 - Site-specific emergency management plans and procedures 3 - Specific tools for predicting imminent extreme events	**Existing assets** 1 - Guidelines for risk assessment and design of hydraulic technology 2 - "Lessons learned feedback" processes from O&M towards E&C and BD **New constructions** In addition to what has been done for existing assets: 1 - Climate Change Risk Assessment (CCRA) included in environmental impact documents (pilot)
Global Infrastructure and Networks	**Existing assets** 1 - Strategies and guidelines on Risk Prevention, Readiness, Response, Recovery actions on distribution network 2 - Global Infrastructure and Networks guidelines for emergency and critical event management 3 - Risk prevention and preparedness measures in the event of fire on electrical installations (lines, transformers, etc.)	**Existing assets and new constructions** 1 - Guidelines for defining network resilience enhancement plans (e.g. the e-distribuzione "Network Resilience Enhancement Plan")
Enel X	**Existing assets** 1 - Enel X Critical Event Management 2 - e-Mobility: guidelines for maintenance and monitoring of assets (repair or replacement of charging infrastructure)	**Existing assets** 1 - e-Mobility: Continuous Improvement program

Adaptation activities – generation

With regard to generation, over time the Group has carried out targeted actions on specific sites and established *ad hoc* management activities and processes.

Actions on specific sites in recent years include, for example:

- improving cooling water management systems for certain plants in order to counter the problems caused by the decline in water levels in rivers, such as the Po in Italy;
- installing fogging systems to improve the flow of inlet air and offset the reduction in power output caused by the increase in ambient temperature in CCGTs;
- installing drainage pumps, raising embankments, periodic cleaning of canals and interventions to consolidate land adjacent to plants to prevent landslides in order to mitigate flood risks;
- periodic site-specific reassessment for the hydroelectric plants for flood scenarios using numeric simulations. The processed scenarios are managed with mitigation actions and through interventions on the civil works, dams and intake systems.

The Group performs various control activities to manage the impact of weather events on electricity generation, such as:

- **weather forecasting** both to monitor renewable resource availability and detect extreme events, with warning systems to ensure the protection of people and assets;
- **hydrological simulations, territory surveys** (also using drones)**, monitoring of possible vulnerabilities** using digital GIS systems (Geographic Information System) and satellite measurements;
- **advanced monitoring of more than 100 thousand parameters (with more than 160 million historical measurements) detected on dams and hydroelectric civil works**;
- **real-time remote monitoring power plants**;
- **safe rooms in areas exposed** to tornadoes and hurricanes;
- **adoption of specific guidelines for carrying out hydrological and hydraulic studies that are targeted, from the first development phases, toward assessing risks inside the** plant and **toward areas external** of the plant, with the application of the principle of hydraulic invariance during the design of the draining and mitigation works;
- **check of potential climatic trends for the main project parameters** in order to keep the dimensioning of the systems into account for relevant projects (for example, assessments of the temperature of a cold source to guarantee greater flexibility for cooling the new CCGT) and specific civil works (e.g. rainfall assessments for the design of drainage systems in solar plants);
- **estimate of extreme wind speed using updated databases** containing the registers and historical trajectories of hurricanes and tropical storms, with the resulting **selection of the wind turbine technology that is best suited** to the conditions that were found.

Adaptation activities – Infrastructure & Networks

In order to deal with extreme climatic events, in the Infrastructure & Networks Business Line, the Enel Group has adopted **an approach called** "4R" which, in a dedicated policy that aims to ensure an innovative strategy for the resilience of distribution networks, defines the measures to be adopted in the phase of preparation for an emergency on the network and to ensure swift restoration of services *ex post*, i.e. once the climatic events have caused damage to assets and/or disconnections. The 4R strategy is divided into four phases:

1. **Risk Prevention**: includes actions that make it possible to reduce the probability of losing grid elements due to an event and/or to minimize its effects, such as interventions able to increase the robustness of the infrastructure and maintenance operations;
2. **Readiness**: comprises all measures that aim to improve the timeliness with which potentially critical events are identified, ensuring coordination with the Civil Protection Department and local officials, as well as to prepare the necessary resources once a grid disconnection has occurred;
3. **Response**: represents the phase for assessing the operating capacity for facing an emergency when an extreme event occurs, which is directly correlated to the ability to mobilize operating resources in the field and the possibility to perform remote controlled operations to restore service via resilient backup connections;
4. **Recovery**: the final phase which has the goal of reconnecting the grid as soon as possible with ordinary operating conditions, in the cases in which an extreme weather event cause interruptions in service in spite of the previously adopted measures for increasing resilience.

Following this approach, the Business Line has prepared various policies **on specific actions** aimed at dealing with the various aspects and risks inherent in climate change, in particular:

- **Policy for preparation and recovery during emergencies**: a policy related to the last three steps of the 4R approach which indicates the guidelines and measures targeted toward improving the preparation strategies, mitigating the impact of total interruptions and, finally, restoring service to the largest number of customers possible as quickly as possible.

- **Guidelines on the Electricity Grid Resilience Plan**: a dedicated policy has the objective of identifying the extraordinary climatic events with the greatest impact on the grid, assessing specific KPIs of the "as-is" grid and improving them on the basis of proposed actions in order to finally assess their order of priority. This makes it possible to select the actions that, when implemented, minimize the impact on the grid of particularly critical extreme events in a certain area/region. The policy is therefore set in the first two phases of the 4R approach, suggesting measures regarding Risk Prevention and Readiness. In Italy, this policy translates into the Resilience Plan that e-distribuzione has prepared every year since 2017, and which represents and addendum to the Development Plan that includes *ad hoc* investments over a 3 year period that aim to reduce the impact of extreme events belonging to a certain critical cluster: heat waves, ice loads and wind storms (falling of tall trees). Around 520 million euros were invested in the period 2017-2020 and a further 345 million euros will also be used in the following three years, as explained in the addendum to the 2021-2023 Plan. In the face of these risks, investments have been planned such as the targeted replacement of bare conductors with insulated cable, in some cases the burying of cables, or solutions that provide re-powering routes that are not vulnerable to the above-mentioned phenomena. As in Italy, in other countries, too, both in Europe and in Latin America, similar topics are being analyzed so as to prepare a process for planning *ad hoc* investments;

- **Policy on prevention and preparation of fire risk on electrical installations**: a policy dedicated to fire risk defines an integrated approach to emergency management applied to forest fires, both in cases in which they are started by events exogenous to the networks and in cases, albeit very minor, in which they are caused by the networks themselves and, in any case, are potentially dangerous for Enel plants.

- **Adoption of systems for weather forecasting, grid monitoring** and assessing the impact of critical climate phenomena on the grid, preparation of operational plans and organization of special exercises.
  During 2021, we further investigated **heat waves** in other countries where Enel is present, and these already provided the first results for the Italy perimeter in 2020.
  This critical event is characterized by the persistence for several days of high temperatures along with the absence of precipitation and, by hindering heat dissipation of underground cable lines, it causes an abnormal increase in the risk of multiple failures on the networks, especially in urban areas and in the centers of summer tourism.
  In Spain, in particular, despite the increase in the frequency and intensity of the climate phenomenon, especially where the presence of buried cables is relatively low, the analyses conducted to date have not found any significant historical correlation between heat waves and failures. Finally, beginning 2022, evaluations are planned to conduct similar analyses in other countries and regions.

Inclusion of climate change effects in the evaluation of new projects

Many activities related to the evaluation and implementation of new projects can benefit from climate analyses, both general and site-specific, which the Group is beginning to integrate with those already considered in the evaluation of new projects. For example:

- **Preliminary studies**: in this stage, climate data can offer preliminary screening, through the analysis of specific climate phenomena, such as those shown above in the analysis of physical scenarios, and summary indicators such as the Climate Risk Index, integrated into the Open Country Risk. These data provide a preliminary measure of the most relevant phenomena in the area, among those identified as being of interest for each technology.
- **Estimation of potential output**: climate scenarios will be progressively integrated to allow for an assessment of how climate change will modify the availability of the renewable resource at the specific site. In the preliminary analysis of the impact of chronic climate change on renewable power generation, the approach applied for the moment on a few pilot sites and then scaled to the entire generation portfolio is described.
- **Environmental impact analysis**: the Group has begun to integrate the Climate Change Risk Assessment into the set of documentation produced, which contains a representation of the main physical phenomena and their expected change in the area.
- **Resilient design**: as described above, among the climate change adaptation activities, those aimed at devising resilient assets by design take on great importance. The Group is working to consider progressively analyses based on climate data, for example the increase in frequency and intensity of acute events. These will complement existing analyses based on historical data already in use, in order to increase the resilience of future assets, including any adaptation actions that may be required over the life of the project.

Identification, assessment and management of risks and opportunities related to transition phenomena

As regards the risks and opportunities associated with transition variables, we consider the different reference scenarios in combination with the elements that make up the risk identification process (e.g. competitive context, long-term vision of the industry, materiality analysis, technological evolution etc.) to identify the drivers of potential risks and opportunities, with priority on events with greater relevancy. The key risks and opportunities identified are:

Policy and regulation

- **Emissions caps and carbon pricing**: the enactment of laws and regulations that introduce more stringent emissions limits for both non-market driven and market-based mechanisms, such as a carbon tax in non-ETS (Emissions Trading System) sectors or an expansion of the ETS into other sectors.
  - **Opportunities**: Command&Control regulations and market-based mechanisms strengthening CO_2 price signals to foster investment in carbon-free technologies.
  - **Risks**: lack of a coordinated approach among the various actors and policy-makers involved and limited effectiveness of the policy instruments deployed, with an impact on the speed of the trend toward electrification and decarbonization in the various sectors, compared with a decisive group strategy focused on the energy transition.

- **Incentives for the energy transition**: development incentives and opportunities with a view to the energy transition, consequently guiding the energy system toward the use of low-emission energy resources as the mainstream approach in the energy mixes of countries, greater electrification of energy consumption, energy efficiency, flexibility of the electrical system and upgrading of infrastructure, with a positive impact on the return on investment and new business opportunities.
  - **Opportunities**: additional volumes and greater margins due to additional investment in the electricity industry, in line with the electrification strategy, decarbonization and the upgrading/digitalization of enabling infrastructure.
  - **Risks**: obstacles to achieving energy transition targets due to regulatory systems that do not effectively support the energy transition, delays in permitting processes, no upgrading of the electricity grid, etc.

- **Resilience regulation**: improvement of standards or introduction of *ad hoc* mechanisms to regulate investments in resilience in the context of the evolution of climate change.
  - **Opportunities**: benefits from investments that reduce service quality and continuity risks for the community.
  - **Risks**: in the case of especially severe extreme events with a greater-than-expected impact, there is a risk of failure to recover within an adequate timeframe and consequently a risk to Enel's reputation.

- **Financial measures for the energy transition**: incentives for the energy transition through appropriate policy measures and financial instruments, which should be capable of supporting an investment framework and a long-term, credible and stable positioning of policy-makers. Introduction of rules and/or public and private financial instruments (e.g. funds, mechanisms, taxonomies, benchmarks) aimed at integrating sustainability into financial markets and public finance instruments.
  - **Opportunities**: the creation of new markets and sustainable finance products consistent with the investment framework, activating greater public resources for decarbonization and access to financial resources in line with energy transition objectives and the related impact on costs and on finance charges; introduction of subsidised support tools (funds and calls) for the transition.
  - **Risks**: actions and instruments not sufficient to provide incentives consistent with an overall positioning tailored to the energy transition, uncertainty or slowdown in the introduction of new instruments and rules due to the deterioration in the public finances or differences in application in the geographic areas in which the Group operates.

Market

- **Market dynamics**: the market dynamics such as those connected with the variability of commodity prices, the increase in electricity consumption due to the energy transition and the penetration of renewables, have an impact on business drivers, with effects on margins and on generation and sales volumes.
  - **Opportunities**: positive effects associated with the growth in electricity demand and the greater room for renewables and all sources of flexibility.

- **Risks**: exposure of "merchant" technologies to the volatility of market prices.

Technology

- **Technology penetration to support the transition**: gradual penetration of new technologies such as storage, demand response and green hydrogen; digital lever for transforming operating models and "platform" business models.
  - **Opportunities**: investments in the development of technology solutions, as well as positive impacts from increased electricity demand and increased room for renewables from green hydrogen generation.
  - **Risks**: slowdowns and interruptions to the raw materials supply chain, including metals for batteries (such as lithium, nickel and cobalt) and semiconductors, could lead to delays in procurement and/or increased costs, such as to slow down the penetration of renewables, storage and electric vehicles.

Products and services

- **Electrification of residential consumption**: with the gradual electrification of end uses, the penetration of products with lower costs and a smaller impact in terms of residential emissions will expand (for example, the use of heat pumps for heating and cooling).
  - **Opportunities**: increase in electrical consumption in the context of reducing energy consumption, thanks to the improved efficiency of the electric carrier.
  - **Risks**: additional competition in this market segment.

- **Electric mobility**: use of more efficient and effective modes of transportation from the point of view of climate change, with a special focus on the development of electric mobility and charging infrastructure; electrification of large-scale industrial consumers.
  - **Opportunities**: positive effects of the increase in electricity demand and greater margins connected with the penetration of electric transportation and the relative beyond commodity services.
  - **Risks**: additional competition in this market segment.

Unlike chronic climate impacts, **developments in the transition scenario could have impacts in the short and medium-long term (by 2030) as well.**
To quantify the risks and opportunities deriving from the energy transition in the long term, two transition scenarios, described in the paragraph "Climate scenarios". The effects of Slow Transition and Best Place scenarios have therefore been identified on the variables that can have the greatest impact on the business, in particular electricity demand, influenced by the dynamics of electrification of consumption, and therefore of penetration of electrical technologies and the electricity generation mix.
Enel's reference scenario - the Paris scenario - entails a growing ambition in terms of decarbonization and energy efficiency, supported by greater electrification of final energy consumption and the development of renewable capacity. The dynamics related to the energy transition will bring increasing opportunities to the Group. In particular, in the retail electricity market, the progressive electrification of final consumption – especially for transport and the residential sector – will lead to a considerable increase in electrical consumption to the detriment of other, more high-emissions energy carriers. Similarly, the gradual increase in the proportion of renewable energy in the energy mix is expected to lead to a reduction in the wholesale price of electricity in the medium to long term. However, this impact is limited, given that the market design based on the system marginal price is unchanged in the medium term. Possible alternative market structures could induce different effects.
In reference to the economic impacts that may result from the change in the transition scenarios, the Group has performed some analyses regarding impacts in terms of EBITDA that the Slow Transition and Best Place scenarios would bring to the 2030 results compared to the baseline Paris scenario.
With reference to the electrification of consumption, the Slow Transition scenario encompasses lower penetration rates of the most efficient electric technologies, in particular electric cars and heat pumps, causing a decrease in electricity demand compared to the Paris scenario, which is estimated to cause limited impacts on the retail commodity business & beyond. At the same time, lower electricity demand results in less development space for renewable capacity, with impacts on the generation business.
With reference to the Best Place scenario, a more rapid reduction in the cost of green hydrogen generation technologies is assumed. This results in a higher penetration of this energy carrier, at the expense of blue and gray hydrogen, with a consequent additional effect on domestic electricity demand and renewable capacity installations compared to the Paris scenario.
For the different countries and regions, all scenarios, but to a greater extent the Paris and Best Place scenarios, will involve a considerable increase in the complexities that will have to be managed by the grids. A significant increase is expected in fact in distributed generation and in other resources, such as storage systems, greater penetration of electric mobility with the relative charging infrastructures, as well as the increasing rate of electrification of consumption and the introduction of new actors with new methods of consumption. This context will involve a decentralization of the extraction/feed-in points, an increase in electric de-

mand and the average requested power, a considerable variation in energy flows, which will require dynamic and flexible grid management. The Group therefore expects that in this scenario incremental investments will be necessary to guarantee the connections and suitable levels of quality and resilience, by promoting the adoption of innovative operating models. These investments must be accompanied by coherent policy and regulation scenarios to guarantee suitable economic returns for the Infrastructure and Networks Business Line.

Time horizon
Short (within 3 years)
Medium (until 2030)
Long (2030-2050)

Upside ● Downside ●

Risk & opportunity category	Time horizon	Scope of analysis	GBL affected	Geographic scope	Description of impact	Quantification - Type of impact		Quantification - range		
								<€100 mn	€100-300 mn	>€300 mn
Policy & Regulation	Short/ Medium	For any given Paris scenario, the Group has assessed the impact on performance of actions to modify the price of CO_2.	Enel Green Power and Thermal Generation	Italy and Iberia	Considering the potential impact of regulatory measures to incentivize energy transition, the Group assesses the exposure to changes of +/- 10% in the price of CO_2 using sensitivity analysis.	EBITDA/year	10% - Upside vs. Paris	●		
							-10% - Downside vs. Paris	●		
Market	Medium	Considering two alternative transition scenarios, the Group assessed the impact of an increase in the penetration of renewables on the benchmark power price and on additional capacity at 2030.	Enel Green Power and Thermal Generation	Global	Greater room for investment in new renewables capacity associated with a decrease in power prices due to increased penetration of renewables.	EDITDA 2030 Best Place vs. Paris				●
					Less room for investment in new renewables capacity associated with an increase in power prices due to decreased penetration of renewables.	EDITDA 2030 Slow Transition vs. Paris				●
Market/ Products & Services	Medium	Considering two alternative transition scenarios, the Group assessed the impact of trends in efficiency, the adoption of electric devices and the penetration of EVs to estimate the potential effect on commodity consumption, including the impact on gas customers due to the increase in electrification and on the demand for beyond-commodity services.	Customer	Global	Increase in margins due to impact of transition in terms of the electrification of energy consumption, mainly linked to forecast increases in green hydrogen.	EDITDA 2030 Best Place vs. Paris			●	
					Decrease in margins due to impact of transition in terms of slower electrification of energy consumption, mainly in residential and transport sectors, and reduced penetration of new technologies.	EDITDA 2030 Slow Transition vs. Paris				●

Note: the estimated transition impacts take account of current coverage levels.

Enel's performance in combating climate change

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The Net-Zero Project

In 2021, Enel internally launched the Net-Zero Project, with two main objectives: to improve further the **mapping of all its direct and indirect emissions**, increasing the degree of accuracy and transparency of reporting, and to **define the pathway for reducing its carbon footprint** until 2040, through the definition of intermediate targets for each source of emissions, **in line with the 1.5 °C pathway**.

As part of the Net-Zero Project, a specific working group has been activated on the **corporate fleet and buildings**, with the ultimate aim of achieving the highest possible degree of electrification and of supplying all the Group's offices and buildings with renewable electricity.
Enel's fleet consists of more than 20,000 vehicles worldwide and the process will include a first phase of electrification of cars, and then involve other vehicles, including heavy vans, excavators and cranes. To support the electrification of the fleet, Enel plans to develop a charging infrastructure composed of 20 thousand charging points, which will be added to the development plan of public charging infrastructure in the country.
As regards buildings, Enel has about 1,500 buildings including offices, stores, warehouses and operations centers, which will be electrified mainly through the replacement of boilers and water heating with heat pumps. Efficiency improvement works are also planned to reduce electricity consumption. Finally, Enel plans to support the electrification plan of the fleet and buildings with the exclusive use of renewable energy, so as to ensure associated zero emissions.

Enel's carbon footprint

In 2021, Enel's carbon footprint was 125.0 $MtCO_{2eq}$ (up 9% compared to 2020), mainly due to the increased generation of electricity from fossil fuels, divided as follows:

- **Scope 1**: 51.6 Mt CO_{2eq} (up 13% compared to 2020) representing 41% of total GHG emissions (99% of which are from power generation activity. In addition, ETS-related emissions are 63% of total Scope 1 emissions (compared to 53% in 2020).
- **Scope 2**: 4.3 Mt CO_{2eq} (up 6% compared to 2020) which represents 4% of total GHG emissions. Furthermore, 69% of the Scope 2 emissions are related to total technical grid losses in the grid;
- **Scope 3**: 69.1 Mt CO_{2eq} (up 7% compared to 2020) which represents 55% of total GHG emissions. This year, Enel has also calculated and introduced in the Scope 3 perimeter the values related to gas extraction and transport emissions for both its thermoelectric generation plants and for the market and the share of emissions related to the supply chain, disclosing it in this Sustainability Report for the three-year period 2019-2021.

The GHG inventory statements were audited by DNV GL, one of the main certification bodies world-wide, with a reasonable level of certainty for Scope 1, Scope 2 and Scope 3 emissions, as limited to the sale of natural gas, and with a limited level of certainty for the other Scope 3 emissions included within the scope of application of the inventory. The audit was conducted according to Standard ISO 4064-3 for the compliance of greenhouse gas (GHG) inventories with the WBCSD/WRI Corporate Accounting and Reporting Standard (GHG Protocol).
For more details concerning Enel's carbon footprint, please refer to the 2021 GHG inventory (accessible via the following link: https://www.enel.com/content/dam/enel-com/documenti/investitori/sostenibilita/ghg-inventory-2021.pdf).

The grid of the future for a just transition

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In 2021, 510.3 TWh were transported on the Group's distribution grid (485.2 TWh in 2020).

Electricity distribution network by geographical area

		High voltage	Medium voltage	Low voltage
Romania	132,334	5%	27%	68%
Iberia	316,506	6%	36%	58%
Italy	1,151,482	(1)	30%	70%
Latin America	633,047	3%	62%	35%
Total (%)		**2%**	**40%**	**58%**
Total (km)	**2,233,368**	**46,860**	**891,221**	**1,295,287**

(1) In Italy there is also 20 km of high-voltage network.

Our mission is to ensure an affordable and reliable quality service through an efficient and digitalized electricity grid, enabling a more sustainable lifestyle through the use of electricity for all our customers. As a Distribution System Operator (DSO), our Group has embraced the challenges of the energy transition to develop the grid of the future: 'smart', modern, flexible and digital. An evolution that needs the grid to transform profoundly into flexible and open systems in which customers, retailers, aggregators, energy generators and new players can operate and collaborate to accelerate the energy transition. Thanks to new digitalized infrastructure, we can open up our networks to active stakeholder participation, providing a platform where everyone can operate equally, encouraging the use of electricity to generate shared value over the long term. Similarly, we have moved from a customer-supplier relationship to a new collaboration model based on partnerships with the supply chain, the innovation ecosystem (start-ups, universities, industrial partners, crowdsourcing), but also with customers and energy generators for co-design and joint development of new solutions.

To support this ambitious transformation, **Grid Futurability®**, the new long-term strategy that defines the grid which we aim to achieve by 2030, has been launched, identifying the actions to be put in place globally, from an industry and stakeholder integration perspective. A strategy which, going beyond more traditional technological investments, takes into consideration the different needs of customers in both rural and urban contexts to identify priorities and proceed to the renewal, upgrading and expansion of grids in the coming years through circular economy solutions and processes, but above all to rethink the integration of grids in the local areas and with communities, thus ensuring a fair and inclusive transition. A new industrial approach that, by focusing on the needs of customers and associating to each investment the relative value created in ESG terms, transforms grid innovation into a tool to improve people's lives concretely, building new ecosystems that make it possible to create shared value in the long term.

Grid Futurability® also aims to ensure the best service quality for all end customers, with particular attention to people with disabilities, to ensure that the infrastructure is resilient to extreme weather conditions, able to accommodate more renewable connections and electric cars, and achieve a safer infrastructure while minimizing environmental impact. Outdated grid assets will be replaced with new sustainable technologies and with a new design to encourage integration into the landscape.

From a technology perspective, sustainable, innovative, and cutting-edge technologies are expected to be widely deployed to transform grids into smart grids. The combination of robust infrastructure with advanced digital solutions will make grids increasingly resilient, participatory and sustainable, and capable of meeting the diverse needs of customers in both emerging and mature markets.

This ambitious project currently involves an investment of 18 billion euros, with a target of around 70 billion by 2030. In the next three years, 200 new primary substations will be activated, more than 15 thousand km of medium-voltage lines will be installed and 38 thousand new inspections will be carried out on the existing grid. These investments will allow us to increase the hosting capacity by about 60 GW and to activate charging infrastructure for more than 12 million electric cars. For further details, see the "Innovability®" and "Circular economy" chapters in this document.

One of the priority objectives of Grid Futurability® is to ensure the environmental sustainability of our grids by leveraging circular economy models, starting from construction phase, with the commitment to achieve full sustainability of our sites by 2030. Through an approach called "**grid mining**" we are analyzing the entire value chain of grid assets in order to recover valuable materials and devices from obsolete grid infrastructure, with the goal of minimizing environmental impact and resource consumption, while maximizing positive social aspects and long-term value creation. The first "grid mining" project was the "Circular Smart Meter", launched in Italy and Brazil with the aim of reducing the environmental footprint of smart meters through the end-of-life regeneration of the materials that make them up, with 100% of the plastic recovered from old, decommissioned meters. Further details on circular economy initiatives in Infrastructure and Networks can be found in the dedicated chapter of this report.

In addition, 2021 saw the launch of **Gridspertise**, a new industrial and commercial entity that offers innovative, flexible, sustainable and integrated solutions to electricity and distribution operators (DSOs), presenting itself to the market as a reliable partner to boost the digital transformation of power grids across the industry ecosystem as part of the energy transition. The offering is structured around three priority areas of DSO digitalization needs across the entire value chain:

- **meter and grid edge digitalization**, focused on increasing customer engagement and stakeholder participation through smart meters and grid edge technologies that also enable engagement in electricity prosumer markets;
- **digitalization of grid infrastructure**, aimed at increasing the intelligence and flexibility of power grids to accelerate full-scale digitalization, increasing efficiency, reliability and service quality and supporting DSOs to manage the challenges facing network operations;
- **digitalization of field operations**, to increase operational efficiency thanks to innovative solutions for planning and operational processes and, at the same time, to increase the safety of internal and external operators in the field.

Gridspertise's solutions and services provide benefits to the entire electricity ecosystem. DSOs can improve service quality, reduce operating costs, optimize investments in new infrastructure, and enhance field operational safety, productivity and sustainability.
Finally, as part of the Net-Zero project, standards and trends for each country were mapped in 2021 to optimize the estimation of direct and indirect GHG (greenhouse gas) emissions. These include "technical losses", energy consumption of DSOs for services, emissions of sulfur hexafluoride (SF_6) contained in some assets and, finally, emissions from emergency generators. For further details, see the chapter "The Path to Net-Zero".

Towards a "nature-based" model

0.07 g/kWh
Specific emissions of SO_2

0.35 g/kWh
Specific emissions of NO_x

0.005 g/kWh
Specific emissions of particulate matter

0.21 l/kWh
Specific water needs

62%
Total waste recovered

183
Projects for the protection of biodiversity

Over **9** thousand
hectares of habitats restored

Protecting natural capital and combating climate change are an integral part of the Company's strategy and the basis of the values by which a company's sustainability is measured.
Preserving ecosystems and species means respecting life, the planet's natural heritage, and the places and symbols of communities. For this reason, in Enel they are considered strategic and integrated factors in the planning, operation and development of our activities for promoting sustainable economic development in the communities where we work, as well as determining factors for consolidating the Company's leadership in the energy markets. Being an energy company, our operations depend on natural resources, but at the same time they have an impact on them. For this reason, we integrate **risk and opportunity assessments into our decision-making processes and our Group governance**, through the definition of **specific targets aimed at reducing impacts on nature, restoring habitats and sharing the benefits of ecosystem services** with the communities with which we interact.

Recent years have marked a significant increase in global awareness of the need for a **commitment to tackle the ever-increasing loss of biodiversity**. This commitment has been strongly relaunched by the Convention on Biological Diversity (CBD), which is working on the Post-2020 Global Biodiversity Framework, a policy document that will be adopted by signatory countries at COP15 to be held in 2022 in Kunming, China. In parallel, the European Commission has published the **Biodiversity Strategy**(1) which includes targets that are binding for Member States.

Enel's commitment to biodiversity

Enel commits to achieve No Net Loss of biodiversity for new infrastructures by 2030, starting implementation on selected projects in high Biodiversity significance areas as of 2025. **To reach this goal, Enel will operate in line with the mitigation hierarchy principles**, to avoid, minimize and recover impacts to Natural Habitats or habitats and species that are threatened, endemic or restricted-range.
Moreover, **Enel commits to preserve forests** and in case deforestation cannot be avoided, Enel pledges to restore/benefit areas of an equivalent value in line to "**No Net Deforestation**" principle.
Enel will not build new infrastructures in UNESCO World Heritage Natural Sites(2).

(1) COMM (2020) 380 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.
(2) In any case, Enel commits to accomplish the obligation arising from service needs with the best viable and affordable solutions.

We actively support the definition of a European Commission action plan, "Towards a Zero Pollution Ambition for air, water and soil - building a Healthier Planet for Healthier People"[3], as a concrete tool to guide environmental performance for the industrial sector, and we have updated our **environmental policy[4] with a view to continuous improvement and management of our assets and service offerings.** We are also an **active participant in the discussion of targets, evaluation and reporting methods and financial instruments** aimed at achieving **the goal of halting the process of biodiversity loss by 2030** and working towards a broadly positive ecosystem recovery by 2050.

Environmental governance

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Enel ensures **constant supervision and monitoring of environmentally relevant activities** through a widespread and harmonized organization at the level of central coordinating structures and at national level. In particular, the Holding Company has a central HSEQ (Health, Safety, Environment and Quality) function with responsibility for guidance, coordination and definition of environmental policy. This is flanked by the HSEQ functions present in the global structure of each Business Line with a role of coordination in the management of the respective environmental issues, ensuring the necessary specialist support in keeping with the Holding's guidelines. At national level, there are staff units with a local coordination function and managers and reference persons identified in the individual operating units who manage the specific aspects of the various industrial sites.

In support of activities for monitoring environmental performance and the definition of improved plans for the operating units of the Business Lines, the Group environmental reporting system **Enel Data on Environment (EDEN)** is used. During 2021, version 2.0 of the EDEN tool was developed to improve the performance of the system and make the data validation procedure and the calculation and reporting of environmental KPIs even more solid.

Environmental Management System

Application of the ISO 14001 certified **Environmental Management Systems** (EMS) is one of the strategic tools defined by the Group's environmental Policy. At the end of 2021, EMSs were activated and certified on almost all operating assets, while for the new plants and installations propaedeutic activities are progressively planned for certification. Given the complexity and variety of operations carried out in the Group, a modular approach has been adopted with the definition of a management system at Holding level, certified ISO 14001:2015, which provides guidance and coordination to the Business Lines on environmental issues. Each Business Line has launched its own EMS focussed on its own specific activities. Furthermore, the main thermal and geothermal production sites in Europe also have EMAS (Eco-Management and Audit Scheme) registration. In complying with the fundamental pillars that form the basis of our environmental policy, specifically in terms of our commitment towards "protecting the environment by preventing adverse effects", the Group "**Stop Work Policy**" was set up whereby all people who work for us are asked to intervene promptly and stop working when risks arise that affect not only their own health and safety but also the environment.

The environmental policy also identifies **training** as an integral part of the EMS. In 2021, 60 thousand hours of training were provided, an increase of about 25% compared to 2020, of which 14 thousand hours were delivered directly by SHE.Factory, the unit of the HSEQ function dedicated to specialist training on health, safety and environmental issues.

(3) COM (2021) 400 final.

(4) Enel has had a Group Environmental Policy in place since 1996, updated in 2018 and again in 2022. The Enel Group's environmental policy extends across the entire value chain and applies to all the production phases of every product and service, including distribution and logistics phases, as well as the related waste management; to each site and building; all relationships with external stakeholders; all Mergers&Acquisitions; every key business partner (including partners related to non-managed operations, joint ventures, outsourcing or third-party producers); every supplier, including service and contractor suppliers; all due diligence and Merger&Acquisition processes.

Environmental policy

Strategic factors in the planning, implementation and development of Enel's operations include protecting the environment and natural resources, tackling climate change, and contributing towards sustainable economic development. These are also key factors in consolidating the Company's position as leader in the energy market. Enel has had a Group environmental policy in place since 1996, based on **four fundamental principles**:

1. protecting the environment by preventing impacts and exploiting opportunities;
2. improving and promoting the environmental sustainability of products and services;
3. creating shared value for the Company and stakeholders;
4. meeting legal compliance obligations and voluntary commitments, advancing ambitious environmental management practices

and pursuing **ten strategic goals**:

1 **To apply internationally recognized Environmental Management Systems to the whole organization, underpinned by the principle of ongoing improvement and adoption of environmental indices to measure the environmental performance of the whole organization.**

a. Ensuring annual compliance with ISO certifications 14001 extension to the entire scope of the Group's activities
b. Streamlining and harmonizing certifications in the various organizational areas, seeking out partnerships and sharing best practices in environmental management

2 **To reduce environmental impacts by using the best available technologies and best practices in the construction, implementation and decommissioning stages of plants, with a view to life cycle analysis and circular economy.**

a. Assessing the environmental impact caused by the construction of plants or by major restructuring operations
b. Examining and applying Best Available Technologies (BAT)
c. Protecting and monitoring surface and groundwater quality in the areas surrounding the plants
d. Ensuring the internal development and application of international best practices

3 **To build infrastructure and buildings that protect the local area and biodiversity.**

a. Assessing the risks and opportunities of biodiversity
b. Developing and implementing infrastructures based on the Mitigation Hierarchy, the No Net Loss and the Zero Net Deforestation principles
c. Developing and updating a Biodiversity Action Plan with projects that take into account the specific aspects of local environments (conservation of the habitats of protected species, reintroduction of particular species and replanting of indigenous flora in cooperation with research centers and nature observatories)
d. Implementing biomonitoring activities (terrestrial, marine, river)
e. Protecting areas of high biodiversity value and, among these, forests and protected areas
f. Mitigating the visual and landscape impacts of power and distribution facilities and protecting archaeological assets during construction activities
g. Undertaking research into innovative solutions to promote the development of urban biodiversity in the provision of infrastructures and services

4 **To play a leadership role in renewables, in the decarbonization of power generation, in the electrification of end-use and in the efficient use of energy, water and raw materials.**

- **a.** Progressively expanding the renewable generation facilities and pursuing the goal of decarbonization
- **b.** Improving the efficiency of power plants
- **c.** Reducing network losses tied to electricity distribution
- **d.** Efficiently managing water resources for industrial uses, with a particular focus on water stress areas
- **e.** Promoting services and products for electrification and end-use energy efficiency

5 **To ensure optimal waste and drain water management and promote circular economy initiatives.**

- **a.** Reducing waste production
- **b.** Reducing the pollutant load of wastewater
- **c.** Increasing the recovery and recycling rate of waste and drain water produced
- **d.** Exploiting by-products for use as raw materials in external production processes
- **e.** Applying the principles of the circular economy and seizing opportunities for reuse in second life equipment and products
- **f.** Carefully selecting disposal service providers and using IT systems for waste traceability

6 **To develop innovative technologies for the environment.**

- **a.** Implementing systems to boost plant efficiency and lower emissions
- **b.** Promoting and developing smart grids and digital asset management solutions to improve their environmental performance
- **c.** Developing innovative solutions to support renewable production (photovoltaic, geothermal, wind, green hydrogen), integrated with energy storage systems
- **d.** Promoting and developing electric mobility
- **e.** Developing innovative solutions for energy efficiency and smart cities
- **f.** Devising innovative services for the modulation of energy consumption that enable greater flexibility and stability of the electricity grid and more efficient use of resources
- **g.** Digitalizing processes and cloud computing

7 **To communicate with citizens, institutions and other stakeholders about the Company's environmental performance.**

- **a.** Publishing the Sustainability Report and providing open data access to the Group's key environmental parameters
- **b.** Communicating with financial analysts and taking part in various sustainability indices
- **c.** Consulting and engaging local stakeholders
- **d.** Disseminating environmental initiatives online

8 **To provide employee training and raise awareness on environmental issues.**

- **a.** Providing training on environmental issues
- **b.** Engaging employees in campaigns to support the environment

9 **To promote sustainable environmental practices with suppliers, contractors and customers.**

- **a.** Applying supplier assessment criteria based on environmental performance
- **b.** Holding meetings for information and training on relevant environmental aspects at the start of the works
- **c.** Assessing suppliers based on their environmental performance in activities carried out on Enel's behalf

10 **To meet and exceed legal compliance obligations.**

- **a.** Ensuring that operations are carried out in accordance with the legal requirements of the various countries and with the voluntary commitments made
- **b.** Correcting any non-compliance with obligations and voluntary commitments
- **c.** Assessing further voluntary environmental actions and practices, including where not legally required

Chief Executive Officer
Francesco Starace

In 2021, implementation of the environmental training programme continued, targeted at increasing the skills of technical staff and personnel with operational responsibilities (**Environmental Competence Building Program**) on the themes of waste management and contaminated sites. The programme will continue throughout 2022, dealing with other relevant environmental topics in order to ensure uniformity of skills and operating standards in all countries where the Group operates. Training sessions were also held for the adoption of the new Group policy on **environmental inspections**, involving the inspectors of each country with a view to aligning execution and assessment criteria. **Awareness days** were also held on sustainability, proper management of environmental events and, in Italy, biodiversity.

Environmental risk analysis

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In order to identify and minimize environmental risks related to our activities, we also apply a series of important investigation and intervention tools at Group level which operate in synergy to protect the environment.

- **Group Policy for the classification and analysis of environmental events.** Environmental events are classified according to their type and relevance. This classification is based on their possible impact on the environmental matrices and on any potentially sensitive areas (eco-systems and protected areas), in addition to their negative impact on the organization itself. The policy defines the communication procedures for such events, analyzing their causes, and monitoring subsequent corrective actions and improvements in accordance with their classification and relevance.
- **Policy for assessing environmental risks and opportunities**. The policy applies to all operational sites and staff functions in the various countries and regions where Enel operates, with the adoption of a unitary model for classifying and assessing environmental risks and opportunities throughout the organization through the adoption at Group level of an IT tool called ERA (Environmental Risk Analysis). The analysis process includes the evaluation of the impacts of significant operational aspects with the various environmental matrices and the mitigation controls adopted to ensure regulatory compliance and observance of the most stringent voluntary targets for continuous improvement. It also makes possible the assessment of environmental significant risks and opportunities linked to governance and strategic activities carried out by the central functions of the organization. Finally, through the definition of aggregate risk indicators and the possible comparison with the evidence derived from the analysis of any accidental environmental events and the periodic Extra Checking on Site (ECoS) visits, the ERA tool allows a high level of integration of continuous control processes between the different levels of the organization and the prioritization of improvement actions.
- **Extra Checking on Site (ECoS) Policy**. The ECoS is a tool for planning and conducting site visits by cross-divisional teams of experts in support of plants and operational facilities and with a view to identifying improvement plans and sharing best practices. In 2021, the different Business Lines across all the Countries in which the Group operates realized 90 ECoS with a focus on the environment. See also the chapter "Occupational health and safety".
- **Environmental assessment of suppliers**. In consideration of the importance that suppliers have in determining the overall environmental performances of the Company, we have adopted a supplier environmental assessment procedure that is structured and homogeneous for the entire Group, and that can be activated in the supplier qualification phase, especially for high environmental risk activities, or following significant environmental events. Assessments aim to verify the Environmental Management System as a whole and propose improvement actions to be shared with the supplier.
- **Environmental inspections of suppliers**. In order to guarantee high environmental standards, including for activities carried out by the contractors, the assessments are accompanied by environmental inspections of activities performed at the operating sites. In order to standardize inspection standards and obtain a structured and widespread control system, the Group's Guidelines on environmental inspections were issued in 2021. This document defines the criteria for planning and carrying out field inspections.

Protection of the natural capital

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Protection of biodiversity is one of the **strategic objectives of our environmental policy** and is regulated by a specific **policy**[5] adopted by Enel in 2015 and which defines the guidelines throughout the Group and the principles according to which we should operate.
With the conclusion of the United Nations Biodiversity Decade, based on the Strategic Plan 2011-2020 (Aichi Targets)[6], there has been an increase in global awareness of the need for further efforts to address not just the climate crisis but also increasing loss of biodiversity.

Aware of the opportunities, but also of the risks, that the energy transition may entail, Enel has decided to contribute actively and to strengthen its commitment to achieving a **"No Net Loss" of biodiversity in the development of new infrastructure by 2030**, with particular attention to areas of high biodiversity importance[7], with respect to the conservation of forests[8] and the safeguarding of protected areas.

The achievement of the No Net Loss objective is based on application of the **Mitigation Hierarchy** in the construction of all new infrastructures, operating, in order of priority, to avoid, mitigate and recover impacts. Only if there are significant residual impacts that cannot be avoided will the most appropriate offset actions be considered to conserve the overall biodiversity value.
This commitment is aligned, in terms of timing, with the targets identified in the European Union's 2030 Biodiversity Strategy, and also plans to begin operating according to these principles from 2025, on selected projects in areas of high biodiversity importance.
With reference to direct activities, and linked to the No Net Loss objective within the same time horizon, Enel has decided to make a further commitment to the conservation of forests according to the principle of "**No Net Deforestation**", recognizing the importance of this both in terms of the richness of the biodiversity that forests preserve and the role they play in terms of carbon sequestration and long-term storage.
Finally, as regards safeguarding protected areas, **Enel will not build new infrastructure on UNESCO World Heritage Natural Sites**[9].

Identifying dependencies and pressures on biodiversity

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The identification of potential impacts on biodiversity and nature is fundamental in order to define the most effective strategies to avoid, minimize, remedy or compensate for the associated effects, in line with the Mitigation Hierarchy. Similarly, the identification of dependencies on biodiversity and natural capital enables identification of the most appropriate strategies to reduce the risks to the Company arising from these dependencies.
The main **dependencies** identified are associated with **ecosystem services** and the **use of resources and raw materials** required to build and operate infrastructure, as summarized below:

- maintenance of the water cycle, which enables the operation of hydroelectric power plants;
- regulation of the climate and climatic events on which the operation of all assets depends;
- soil stabilization and erosion control, important for hydroelectric reservoirs and transmission and distribution infrastructure;
- protection from floods and extreme environmental events, which are one of the primary causes of failure and unavailability of network facilities;
- use of water in production cycles, mainly in thermoelectric power generation;

(5) The policy is also available at the following link: https://www.enel.com/en/investors/sustainability/topics-performance-sustainability/biodiversity.
(6) United Nations General Assembly Resolution A/RES/65/161 March 11, 2011 (https://www.cbd.int/undb/goals/undb-unresolution.pdf).
(7) To identify areas of high biodiversity importance, the following general criteria are considered: 1) protected areas (UNESCO World Heritage Natural Sites and IUCN I-IV); 2) Critical Habitats as defined by IFC Performance Standard 6; 3) presence of protected species ("Biodiversity indicators for site-based impacts" - UNEP-WCMC 2020).
(8) The FAO definition of forest is used: Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. Reforestation actions to compensate for impacts that could not be avoided will be offset, alternatively, through dedicated projects or by contributing to reforestation initiatives promoted by partners, conservation organizations or through public or private projects, giving priority to offsets in the same geographical areas or regions where the impacts occurred, if possible, and of the same value.
(9) In any case, Enel commits to accomplish the obligation arising from service needs with the best viable and affordable solutions.

- use of raw materials (mineral and non-mineral) for the construction and operation of assets.

Enel's decarbonization strategy, focused on the growth of renewables and in particular wind and solar power, makes it possible to reduce most of the dependence on raw materials. Moreover, by reducing the risk of climate change, it helps to ensure the continued availability of ecosystem services.

The main **pressures** that can be exerted on nature are summarized in the following categories: **use and modification of ecosystems** (terrestrial, freshwater, marine); **use of resources** (mainly water withdrawal); **climate change**; **pollution**; **disturbances and introduction of invasive species**. These categories are inspired by those identified by **Science Based Target for Nature (SBTN)**[10] and are the point of departure for analyzing the actions implemented to mitigate the associated risks.

In order to identify the priority areas for the Group, a risk analysis has been developed which, starting from the importance of each of the previous categories (understood as the potential impact of the activities carried out by the Group), and considering the risk mitigation and control actions already in place, identifies the priorities for action. From this analysis, by focusing on the categories of medium and high significance, it emerged that the level of control is already very high for risks associated with the use of natural resources (water withdrawals), climate change and pollution of environmental matrices. Indeed, for years Enel has already been defining stringent improvement targets that enable it to mitigate the main risks associated with them. The priority identified is the control of **risk relating to land occupation and transformation of ecosystems**, and in particular to land use and the transformation of terrestrial habitats, in relation to which the new commitments reported at the beginning of this paragraph have been undertaken.

Pressure	Importance • Relevance • Severity	Level of control • Mitigation action • Goals	Priorities
Land use • Habitat transformation and fragmentation	High	Moderate	High
Exploitation of resources • Water consumption	High	High	Moderate
Climate change • Climate-changing gas emissions	Very high	Very high	Moderate
Pollution • Pollutant emissions • Water and soil pollution	High	High	Moderate
Invasive species and other • Introduction of invasive species • Noise and other	Low	Low	Low

Low Moderate High Very high

(10) Science Based Target for Nature - Initial Guidance (September 2020).

Measures taken to reduce impacts

Enel has consolidated experience in the management and protection of biodiversity in the surroundings of our production sites, an activity which, over the past few years, has been focussed on the renewables segment and on grids in an increasingly large number of countries.

As a general safeguard, since 2019 Enel has adopted a **Group Guidelines** which outlines the principles and procedures for managing impacts on biodiversity during the entire life cycle of plants, from the development phase through to operation and decommissioning, and provides, as already anticipated, for the application of the **Mitigation Hierarchy** in the various project phases.

On the basis of these principles, in the Group's plants and installations in the area, monitoring is carried out to prevent impacts on ecosystems, also considering that these plants have generally achieved a new balance with the surrounding nature.

In relation to new plants, and in particular renewable ones, the potential exposure to a biodiversity risk is highlighted starting from the phase of feasibility analysis, taking into account the geographic proximity of the sites to protected or important biodiversity areas, and the potential presence of endangered species, to continue with **Environmental Impact Assessments**[11]. A local prioritization of risks is then defined in order to identify solutions to avoid the most significant impacts and to define a local action plan.

These evaluations are part of a more extensive analysis for the application of the "Creating Shared Value" model through which the Company engages with the socio-economic and environmental requirements of the local area, defining the project to create long-term value for itself and for the local communities.

Once the infrastructure is commissioned, **protection of biodiversity becomes an integral part of environmental management, through periodical monitoring for the control of impacts highlighted in authorization phase**. This is also the moment where the plant consolidates its relationship with the local area and where initiatives are developed, such as voluntary projects, to safeguard local species based on the knowledge of the environment surrounding the site. The results of monitoring at the local level are communicated and analyzed at global level, allowing the identification of those general issues that need to be addressed with improvement plans or projects at Group level.

Global initiatives include the **Wind Wildlife Challenge** project, which involves identifying needs, sharing experiences and best practices, as well as innovative solutions, to reduce further the interference of wind plants with avifauna and bats. As part of this initiative, in 2022 tests will also be launched on various sensors and innovative tools based on radar, camera and multi-sensor technologies capable of detecting, deterring and possibly triggering the automatic shut-down of the affected turbine, involving plants in Italy, Spain, the United States and Canada. This testing campaign follows the one already launched in 2021 in the South African plant of Gibson Bay with ultrasonic deterrent systems specifically for bats.

As part of the Global Infrastructure and Networks Business Line, specific strategies will be adopted to mitigate the environmental impacts of the construction of new grids and the modernization of existing ones. The cabling ratio is the relationship (in percentage terms) between the length of the cable lines and the total length of the lines, showing immediately the mitigation of the environmental impacts of the electric lines. The increase in this index over time is due to a progressive increase in the length of overhead insulated cable and buried cable lines, reducing the proportion of bare conductors, with benefits in terms of the resilience of the grid, curtailing plant-cutting activities and a drastic reduction in the risk of electrocution for birdlife. In 2021, the cabling ratio showed an increase of two decimal points compared to the previous year, standing at 60.6%, thanks also to the noteworthy contribution from Latin American companies.

(11) Other assessments include, where significant, effects on population and sensitive or migratory species due to noise and habitat degradation, soil erosion due to drainage, pesticide use and tree felling, possible loss of plant species due to chemical use, aquatic flora, and sediment transfer.

The biodiversity action plan

In 2021, **183 projects** were carried out to protect species and natural habitats at operating plants, 60 of which were developed in partnership with government agencies and non-governmental organizations and universities, for a total investment of **8.2 million euros**. The projects are carried out in all countries and regions and mainly concern renewable generation plants and distribution networks. Examples of measures to mitigate impacts on biodiversity, by way of implementation of the relevant policy, are available in the Sustainability section of the website www.enel.com at the following link: https://www.enel.com/investors/sustainability/daily-commitment/enviromental-sustainability/biodiversity.

Specifically, as regards projects that also include habitat recovery activities, these have involved over 9 thousand hectares, most of which are related to ecological restoration and reforestation, mainly in Colombia, Brazil, Chile and Spain. The surface area affected by restoration projects in 2021 increased compared to the previous year (4,356 hectares in 2020), both for the commencement of new restoration projects and for the effective increase of the surface areas subject to restoration in the ambit of projects already active beforehand.

In addition to biodiversity projects developed on plants in operation, in 2021 94 projects were developed for the construction phase of new renewable energy plants, mainly in Brazil, Chile, Spain and North America, targeted at the conservation and monitoring of native species impacted, for an overall capital expenditure of 7 million euros.

183 projects
for the protection of species and natural habitats

9,092
acres of habitat restored

The projects for the protection of species and natural habitats

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Table of projects (excluding Worksites)

Country	Projects				Project type			
	Number of projects	Mandatory	Voluntary	of which voluntary	Monitoring	Conservation (species)	Restoration (habitats)	Research and other purposes
Iberia	**31**	4	27	87%	6	15	5	5
Italy	**28**	7	21	75%	2	26	-	-
ROE* (Greece; Ireland; Romania)	**11**	3	8	73%	3	7	1	-
North America	**7**	6	1	14%	3	3	-	1
Mexico	**8**	7	1	13%	5	1	1	1
Brazil	**42**	31	11	26%	17	8	15	2
Chile	**21**	10	11	52%	11	3	4	3
Colombia	**16**	9	7	44%	3	7	6	-
Guatemala	**8**	5	3	38%	5	-	3	-
Peru	**7**	3	4	57%	3	4	-	-
Russia	**2**	2	-	-	1	1	-	-
South Africa	**2**	2	-	-	2	-	-	-
Total	**183**	**89**	**94**	**51%**	**61**	**75**	**35**	**12**

Ecosystems

Terrestrial ecosystems · Marine Coastal ecosystems · Aquatic ecosystems

Species concerned

Terrestrial Fauna · Aquatic Fauna · Avifauna · Ichthyofauna · Chiroptera · Pollinators · Terrestrial Flora

The Red List, compiled by the International Union for Conservation of Nature (IUCN), provides information on the conservation status of various species.

Critically Endangered (CR) · Endangered (EN) · Vulnerable (VUL) · Near Threatened (NT) · Least Concern (LC)

Ecosystems	Species	Number of species on the IUCN Red List					
Type	Class	CR	EN	VU	NT	LC	Total
Forest; Shrublands; Grasslands; Inland Wetlands; Rocky Areas; Marine Coastal		-	3	7	3	31	44
Grasslands; Artificial; Shrublands; Rocky Areas; Caves; Wetlands Coastal Marine Aquatic;		1	1	-	1	11	14
Inland Wetlands; Grasslands; Shrublands		-	4	12	3	76	95
Grasslands; Savannah		-	1	2	1	67	71
Grasslands; Savannah		-	-	-	3	95	98
Forest; Grasslands; Savannah; Shrublands		1	13	33	88	525	660
Forest; Uncultivated Area; Desert; Savannah; Shrublands; Rocky Areas; Inland Wetlands		-	-	2	3	42	47
Forest; Shrublands; Inland Wetlands; Marine Coastal		2	7	15	11	313	348
Forest; Inland Wetlands		2	3	3	4	45	57
Desert; Forest; Inland Wetlands/Freshwater Rivers and Lakes		-	-	-	1	3	4
Grasslands		-	-	2	-	78	80
Grasslands		-	3	2	1	25	31
		6	35	78	119	1,311	1,549

Interaction of assets with biodiversity and protected areas

In order to monitor even more effectively its performance in terms of biodiversity protection, beginning this year Enel has introduced a series of new quantitative and qualitative indicators in order to measure the pressure and potential impacts generated, with particular attention to land occupation and ecosystem modification, which have been identified as priority issues. In order to achieve this goal, a specific GIS (Geographic Information System) application, the Environmental Engine, has been developed to correlate geo-referenced information related to industrial assets with environmental maps related to land use classification, natural habitats, protected areas, critical habitats and ranges of endangered species.
The main indicators introduced are shown below.

Land occupation: the area of land occupied by power generation assets. This is a general indicator, as it does not provide an indication of the quality of the land that has been occupied by the assets.

Land occupation[12]

Technology	Hectares (ha)
Solar	16,650
Wind	12,640
Hydroelectric	202,500
Geothermal	445
Thermal	5,200

Transformation of natural habitats: measures the area of land occupied in hectares (ha), classified according to the IUCN[13] categories on which the assets have been built. It therefore represents a specific indicator of the habitats that have been transformed to build the plants. Estimating the value of this indicator for new infrastructures will make possible the assessment of the effectiveness of impact reduction processes and the adequacy of mitigation and offsetting actions.
For assets starting operation from 2021, the total new land occupation was approximately 10,700 ha, of which approximately 7,530 ha (70%) related to natural habitats, and 176 ha (1.6%) to forest type habitats.

Presence of assets in protected areas: mapping was carried out for all power generation assets to assess the presence of assets in UNESCO protected areas and IUCN I-IV classified protected areas. As can be observed, the presence of power generation assets in protected areas mainly concerns hydroelectric plants, being mainly reservoirs built many years ago, generally before the protected areas were established, and for which a new balance with the surrounding environment has been achieved.

Presence of power generation plants in protected areas – by technology

Technology	no. infrastructures in protected areas / total number	Countries	Presence in protected areas (ha)	Presence in protected areas as % of the total occupied by technology
Solar	4 / 141	Greece	32	0.2%
Wind	8 / 266	Italy/Spain	116	0.9%
Hydroelectric reservoirs	161 / 1,096[14]	Italy/Spain/Chile	5,595	2.8%
Geothermal plants	0 / 39	-	-	-
Thermoelectric plants	2 / 98[15]	Italy	2	0.04%

(12) Land occupation was calculated for power generation facilities using a GIS application in which each plant was modeled and geo-referenced. The following criteria were used to model land occupation and the area of influence: solar, thermoelectric and geothermal were modeled with the plant perimeter; for hydroelectric, the perimeter of the reservoirs was modeled; for wind plants, from the position of the generators the area of land occupation is modeled in a precautionary manner to take into account ancillary works such as yards, roads and areas used when the construction site is operative (in so as far as they are subsequently restored).
(13) "IUCN Habitat Classification: 1) Forest, 2) Savannah, 3) Shrubland, 4) Grassland, 5) Wetlands (inland), 6) Rocky Areas (e.g. inland cliffs, mountain peaks), 7) Caves & Subterranean Habitats (non-aquatic), 8) Desert, 9) Marine Neritic, 10) Marine Oceanic, 11) Marine Deep Ocean Floor (Benthic and Demersal), 12) Marine Intertidal, 13) Marine Coastal/Supratidal, 14) Artificial – Terrestrial, 15) Artificial – Aquatic, 16) Introduced Vegetation, 17) Other, 18) Unknown"; https://www.iucnredlist.org/resources/habitat-classificationscheme.
(14) Number represents single reservoirs, not hydroelectric power generating plants.
(15) The figure includes plants being decommissioned.

Presence of power plants in protected areas (GRI 304-1) – by country

	Renewable and thermoelectric power plants	
Countries	**Hectares (ha)**	**% in protected areas on the total area occupied in the country**
Italy	3,712	19%
Spain	1,986	8%
Greece	32	5%
Chile	15	0.03%
Group total	**5,745**	**2.4%**

Biodiversity Significance[16]: this qualitative indicator makes it possible to classify power generation plants according to the importance of biodiversity present in their proximity (high/medium/low). The methodology therefore makes it possible to identify priority sites for the protection of biodiversity in order to ensure proper management to mitigate potential impacts. It should also be noted that most sites of high significance are related to hydroelectric power, so they are generally infrastructures built in mountain areas and present in the locality for many years.

Sites of high biodiversity significance	**16 / 141**	**65 / 266**	**564 / 1,096**[14]	**35 / 98**[15]	**0 / 39**

Presence of endangered species in the proximity of plants/assets: knowledge of protected species potentially present in the proximity of assets is important in order to evaluate the actions needed to reduce the risk of interference by Enel assets. This type of mapping is carried out on all infrastructures for which biodiversity projects are executed, so as to verify the adequacy of the monitoring and conservation actions implemented. The summary of this mapping is presented in the infographic table of biodiversity projects.

Valuation of ecosystem services: among the approaches that have been developed for some years in the scientific community to describe fully the contribution provided by biodiversity and nature, one of this concerns the evaluation of ecosystem services. On this topic, Enel has launched pilot studies to verify how this approach facilitates better environmental management of its infrastructures in order to maximize the benefits for the environment and for local communities (see the box "**Optimization of ecosystem services in Chile**").

(16) To identify areas of high biodiversity importance, the following general criteria are considered: 1) Protected areas (UNESCO World Heritage Natural Sites and IUCN I-IV); 2) Critical Habitats as defined by IFC Performance Standard 6; 3) Presence of protected species, according to the methodology developed by UNEP-WCMC ("Biodiversity indicators for site-based impacts", 2020).

Optimization of ecosystem services in Chile

The objective of the study is to define an approach to evaluate the ecosystem services provided by seven natural areas taken as a benchmark and which are part of the appurtenances of several hydroelectric plants owned by Enel in Chile.
In particular, the most important ecosystem services have been identified and characterized, proposing feasible and sustainable management and conservation actions, with the aim of enhancing the natural capital available.
Starting from the knowledge of the natural capital available in the area, the study conducted applies models of territorial management that seek to protect the natural assets present and the potential benefits associated with them, including especially those at risk of being lost, through an adaptive management of nature in the area, and their contribution to social and economic development.
The methodology has already been applied to five of the seven areas covered by the project, all with different characteristics from each other, for a total area of about 10,300 ha. Ecosystem services have been classified according to the "Common International Classification of Ecosystem Services" (CICES – **https://cices.eu/**) and other locally accepted international standards, and identified through a scientific and participatory approach, classifying them into three main areas: cultural services, regulation and procurement. The main ones are shown in the following table.

Main ecosystem services identified

Area	Sector	Ecosystem service
La Escuadra	Regulation	• Deep water infiltration • Erosion control • Fire protection
Pehuenche	Procurement	• Firewood • Wild fruits
Pilmaiquén	Regulation – Cultural	• Hydrogeological regulation • Recreational activities
The Blue Lagoon	Regulation	• CO_2 capture by the forest
Bajo Pascua	Regulation	• CO_2 capture by the forest

In quantitative terms, it was possible to enhance 40 out of 43 ecosystem services identified for the La Escuadra – Pehuenche area, 14 out of 26 for Pilmaiquén and 28 out of 41 for Bajo Pascua – The Blue Lagoon. The total is about 5,000 tCO_2 sequestered per year, in the case of management fully oriented to the provision of this ecosystem service, and about 360,000 euros per year of value shared with local communities for all other ecosystem services.

Stakeholder engagement

In recent years, nature and biodiversity issues are climbing up the global sustainability agendas and new stakeholders and multilateral initiatives are emerging to set goals and targets and stimulate the development of more ambitious policies to preserve biodiversity.
Enel is actively committed to this process, collaborating with the most relevant global stakeholders and participating in multistakeholder initiatives and dialogues. In particular, the main initiatives undertaken during 2021 included:

- joining the **Science Based Target Network**, a project that, on the trail of the Science Based Targets initiative (SBTi) in the area of climate change, will define a process to identify specific improvement targets for nature and biodiversity conservation;
- our collaboration with Business for Nature, launched in September 2020 with the signing of the **call-to-action "Nature is everyone's business"**. In particular, Enel is contributing to the organization's efforts to raise the ambition of the Post-2020 Global Biodiversity Framework, which is compared, in terms of international relevance, to what the Paris Agreement was for the climate, and which is expected to be adopted at the United Nations Conference on Biodiversity (COP15). Through the network, Enel has also joined the business delegation for the pre-COP15 negotiations in Geneva in March 2022;
- membership of CSR Europe's Biodiversity & Industry platform, which aims to provide a framework for the integration of biodiversity into the decision-making processes of companies;
- participation in the multistakeholder dialogue promoted by the WBCSD for the definition of the concept of "Nature Positive", which led to the report "What does nature-positive mean for business?";
- membership of the TNFD Forum, an advisory group in support of the new Taskforce on Nature-related Financial Disclosure (TNFD) working to establish a global framework for companies and financial institutions to assess and report on nature- and biodiversity-related risks and opportunities by 2023.

Furthermore, a series of initiatives was recently launched globally, targeted at the definition of metrics and approaches for the evaluation of the sustainability of economic sectors in terms of impacts on biodiversity. Among the most significant are those of the World Economic Forum (WEF), which defines general reference metrics for land and water use and, in the framework of the European Commission, the definition of the biodiversity taxonomy, which, by 2022, will provide a common classification of economic activities that contribute to protecting and restoring biodiversity and ecosystems.

The collaboration with Business for Nature, launched in September 2020 with the signing of the call-to-action "Nature is everyone's business".
In particular, Enel contributes to the organization's efforts to raise the ambition of the Post-2020 Global Biodiversity Framework, which is compared – in terms of international relevance – to what the Paris Climate Agreement was, and which is expected to be adopted at the United Nations Conference on Biodiversity (COP15). Through the network, Enel has also joined the business delegation for the pre-COP15 negotiations in Geneva in March 2022.

Training and internal communication

With the aim of involving and raising awareness of all Enel people on the issues of protection and conservation of biodiversity, a series of specific initiatives have been promoted.

- Following the completion in 2020 of the **Biodiversity** pillar of the **Competence Building Program** dedicated to technical personnel and those with operational responsibilities, in 2021 an awareness-raising training course on biodiversity was carried out in Italy, during which the basic principles, the Enel policy, the main projects at Group and Italy level, and the points of view of the main NGOs active on the subject were covered. This initiative will be extended during 2022 to all Group personnel.
- The Enel X Global Retail Business Line launched a new project in 2021, "**We're part of the solution**", to raise awareness of the importance of the United Nations' International Day for Biological Diversity (IDB) and reaffirm that biodiversity is the solution to many of the challenges facing us, from climate change to health issues, and from the safety of food and water to sustainable livelihoods.
- A **photo contest** was launched, in which all Group people could participate, with the aim of capturing the best positive examples of integration of our industrial infrastructure with nature.

Several biodiversity projects

AGROVOLTAICS: the balance between nature and solar power

In 2021 Enel launched an experimental program on agrovoltaics, involving 9 solar plants in Spain, Italy and Greece with the aim of demonstrating the technical and economic feasibility of coexistence between large solar plants "on the ground" and agro-zoological activities, promoting the conservation of local biodiversity and indigenous ecosystem services, and enhancing local communities through a multistakeholder approach. The results obtained to date are very promising in terms of feasibility of integration of solar plants with crops, as they promote better shading and reduction of water stress due to less direct solar radiation on the crop itself. Some experimental projects were launched in 2021, which have involved the use of new technologies and layouts for solar plants, with the aim of protecting crops from possible extreme events due to climate change. Specific solutions are also being tested for the safeguarding of local biodiversity and the improvement of ecosystem services both in the areas where the plant is situated and in marginal areas in the plant's vicinity.
In Totana, for example, techniques are being tested for the protection and improvement of the habitat of steppe birds living in this area, through the use of a species of leguminous plant, a source of nutrients, able to improve oxygenation of the soil and avoid the formation of invasive grasses while at the same time favoring nesting. In the Pezouliotika plant in Greece, in addition to the use of crops that attract pollinator species in areas close to the plant, a biodiversity hot spot has been created through the restoration of a strip of semi-natural grassland, typical of the surrounding ecosystems, improving the ecosystem services of the area itself and the habitat of some species of butterflies, some of which are even at risk of extinction. The application of the BACI (Before-After-Control-Impact) protocol will make it possible to measure and evaluate the effect of the adopted solutions on the target species.
The activities will continue in 2022. It should be noted that in January the feasibility analysis was started in the Las Corchas plant in Spain, on an area equal to 60-70% of the total extension of the plant, corresponding to about 50 ha. This will represent the first large-scale ground-mounted agrovoltaic plant with technological application of integration and coexistence on the same soil of the two different businesses, power generation and agriculture. Finally, in the Bastardo plant in Italy, beginning in April 2022 crops will be used that promote the increase in the presence of pollinator species. In addition, the installation of some high-tech hives is planned, equipped with sensors of humidity, temperature, weight and sound of the hive to characterize the surrounding environment through the analysis of the health status of the bees, which should be considered as biosensors.

"At Enel Green Power we aim to improve the environmental and social sustainability of photovoltaic plants, seeking and testing innovative approaches and solutions to promote biodiversity and enhance ecosystem services. We are working on defining new business models in partnership with farms and local communities with the aim of promoting the co-location of sustainable agro-livestock activities on ground-based photovoltaic plants and creating shared value."

Miriam Di Blasi

Environment and Impacts Mitigation – Innovation at Enel Green Power

"La Primavera" project - Colombia

The project is framed as a work of compensation of mandatory maintenance activities carried out at the electrical transmission and distribution networks, which involve clearing of vegetation, in compliance with current environmental regulations and applicable technical standards, in order to limit the risk of service interruption or fire ignition. In this context, Codensa, an Enel Group subsidiary in Colombia, has developed a Forest Compensation Plan with indigenous plant species to protect and conserve areas of interest.

The activities started in 2018 with the planting of more than 42 thousand trees in the "La Primavera" forest reserve in the municipality of Pacho, which covers about 40 ha, and takes on a key role in the protection of the waters in the department of Cundinamarca.
The project included an initial biophysical characterization study of the area, to collect information on the ecosystem, climate, geology, hydrology and flora and fauna species of the forest reserve. As a result of this research, 18 indigenous plant species suitable for the area were selected. A monitoring plan was also defined through the use of innovative tools such as drones, to analyze the development of the plantation. The project has involved the local community in the activities of ecological protection of the area, including training, planting and forest maintenance, promoting environmental awareness within the community itself. **In 2021, after 3 years of maintenance, it was possible to hand over the area to the authorities having comprehensively compensated the maintenance activities considering 5 trees planted for each one felled.**

Enel X: Urban Biodiversity Strategy

Enel X has begun promoting a global urban biodiversity strategy to provide cities and its customers with new opportunities to introduce nature-based solutions that promote biodiversity and help make cities resilient by mitigating the microclimate, the quality of the air and by generally improving the quality of life. The strategy, which involves the integration of nature-based solutions into the Enel X offering portfolio, is being developed in the main countries where Enel X is present.
Among the various initiatives, mention should be made of the work being carried out at the SUBA e-bus electroterminal, located in the Thomas Van der Hammen reserve located in the city of Bogotá (Colombia). The electroterminal was built in a site that existed before the construction of the infrastructure where, in collaboration with leading universities and local authorities, Enel X presented a project to restore ecological connectivity through the restoration and planting of 730 specimens of native forest species, in order to reduce the ecosystem fragmentation of the reserve

730
native vegetation planted

3.65 ton
CO_2/year

and to generate a suitable habitat for pollinator species.
In addition, Enel X was the first company to make a commitment to nature-based solutions and to adopt three beehives that have been placed in the Bee Garden on the roof of the Tor di Quinto headquarters in Rome, housing up to 180 thousand honeybees. Thanks to this project, educational workshops will be organized in which participants will be able to observe bees from close up, in complete safety and under the guidance of experts, and to learn why they are so important for our survival.

Reducing pollution in the atmosphere

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The reduction of the environmental impacts associated with the operation of our plants is a strategic objective for us, pursued through the application of the best technologies available and of best international practices. The energy transition towards production from renewable sources, such as solar and wind power, contributes to a progressive reduction in specific emissions. During 2021, in particular, Enel's commitment to the path towards decarbonization continued, with the closure of the Litoral coal-fired power plant in Spain. It should be noted, however, that, during 2021, higher demand for power, in conjunction with lower hydroelectric generation in some countries of the perimeter and in particular in Latin America, led to an overall increase in thermoelectric generation compared to 2020, particularly from O&G plants (+17% compared to 2020) and CCGT (+19% compared to the previous year).

Direct greenhouse gas emissions

305-1

The reduction of greenhouse gases is one of the priority objectives indicated in our environmental policy as well as in the Group strategy, and must be pursued through the progressive broadening of generation capacities in terms of renewable energy sources and improvement of the efficiency of infrastructures. Direct greenhouse gas emissions from Enel's industrial activities can be mainly traced back to carbon dioxide (CO_2) emissions from thermoelectric power plants and, to a lesser extent, to sulfur hexafluoride (SF_6) losses across the distribution network. Specific CO_2 emissions (Scope 1) in 2021 amounted to **227 g/kWh$_{eq}$**[17] (**-45% compared to 2017**), up slightly compared to 2020 (+6%) due to higher energy production from gas-fired plants, as anticipated. Despite the 2021 figure, linked to the contingency of the year, the medium-term reduction remains in line with the target verified by the Science Based Targets initiative that the Group has set at 2030.

As a further contribution to reducing greenhouse gas emissions, the Infrastructure and Networks Business Line will commit to purchasing an increasing number of SF_6-free equipment and devices in the coming years.

For further details on greenhouse gas emissions, please refer to the chapter "The path to Net-Zero".

SO_2, NO_x, and particulate matter

103-2 | 103-3 | 305-7

Our commitment to improving the quality of the air in areas where we operate is testified to by the great care we pay to the constant reduction of the main atmospheric pollutants associated with thermal production: **sulfur oxides (SO_2)**, **nitrogen oxides (NO_x)**, and **particulate matter**. To this end, over the years various measures have been taken to improve environmental performances on specific thermal plants, the choice of which is the outcome of an analysis that, beginning from best technologies and international practices, takes into consideration factors such as context and local priorities, the plant's operation mode, understood as annual operating hours, current plant configuration and the prospects of productive life. During 2021, the total investment in environmental measures amounted to 29 million euros.

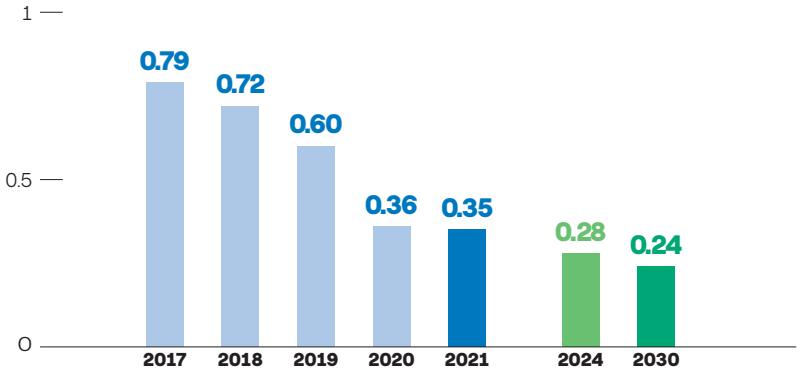
With respect to the values in 2017, the Group set further important targets specifically related to the reduction of emissions of atmospheric pollutants by 2030. These targets see specific emissions in 2030 of 0.05 g/kWh$_{eq}$ for SO_2 (-94% compared to 2017), 0.24 g/kWh$_{eq}$ for NO_x (-70% compared to 2017) and 0.005 g/kWh$_{eq}$ for particular matter (-98% compared to 2017). Pollutant reduction trends and targets are consistent – in as much as they are linked to the Strategic Plan and to the Group's decarbonization objectives.

Emission measurements are carried out in compliance

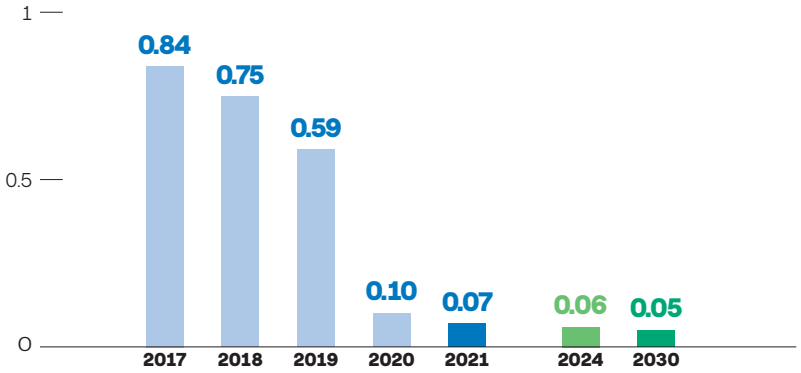
(17) Value related only to consolidated production. In relation to the overall value of the capacity managed, CO_2 emissions amount to 205 g/kWh$_{eq}$.

with each country's regulatory framework and, in the majority of large plants, a measurement system is used that can assess compliance with the limits in real time. Its reliability is guaranteed by accredited certifying entities and through assessments carried out by inspection authorities.
In 2021, there was a decrease in absolute and specific terms for SO_2 and particulate matter. For NO_x, mass emissions recorded a slight increase linked to the higher amounts of power generated from gas-fired and CCGT plants, but specific emissions decreased due to the concomitant increase in the generation of energy from renewable sources.
Specifically, **specific NO_x emissions were 0.35 g/kWh$_{eq}$ (-56% compared to 2017), SO_2 emissions were 0.07 g/kWh$_{eq}$ (-92% compared to 2017), and particulate matter emissions were 0.005 g/kWh$_{eq}$ (-98% compared to 2017).**

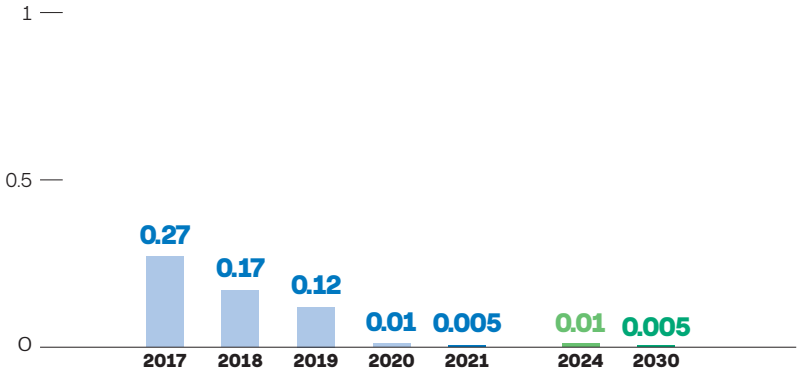
NO_x (g/kWh$_{eq}$)



SO_2 (g/kWh$_{eq}$)



Particular matter (g/kWh$_{eq}$)



Reduction targets of our main emissions by 2030
(vs base year 2017)

NO_x
-70 %
vs 2017

SO_2
-94 %
vs 2017

Particular matter
-98 %
vs 2017

Responsible use of water

103-2 | 103-3 | 303-1 | 303-2 | 303-3

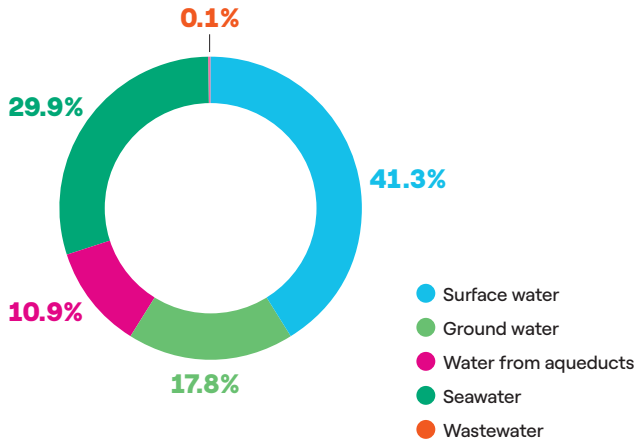
The responsible use of water resources and their protection are vital for the safeguarding of natural ecosystems and for the wellbeing of people that live in them, as well as for the success of our activities.
The Group withdraws water prevalently for industrial purposes and uses it primarily for thermal and nuclear power generation, for the cooling of thermal cycles, and atmospheric emission abatement systems. Overall water needs for production are covered through withdrawal from what is referred to as non-scarce sources (seawater) and scarce sources (surface freshwaters, groundwater and water for civilian use). Where locally permitted, we use, as incoming water resources for our own processes, treated waste waters, typically supplied by water management consortia.

Efficient use of water resources

Total process and closed-loop cooling **water withdrawal** in 2021 was approximately 55.6 Mm^3, with an increase of approximately 8% compared to 2020 due to increased thermoelectric power generation.

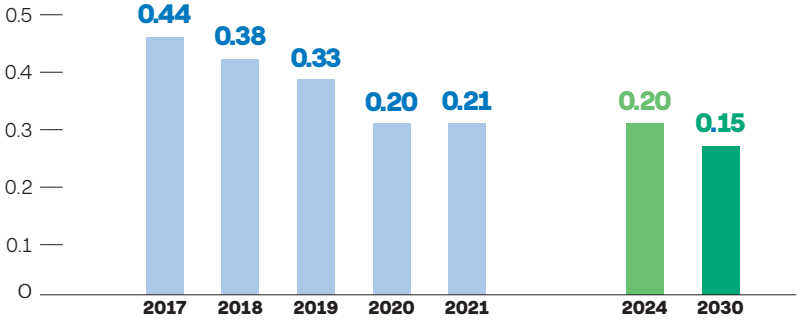
Enel is vigorously pursuing the objective of reducing its **specific water requirement**[18], with a target of a 65% reduction in 2030 compared to the 2017 value, defined on the basis of the results achieved and the new Plan, which envisages for an even more efficient use of the water resource in existing thermoelectric plants, the evolution of the energy mix towards renewable sources and the progressive reduction of generation from fossil fuels. **The specific requirement in 2021 was 0.21 l/kWh, stable compared to 2020 (0.20 l/kWh) and in line with the Group's reduction targets (-52% compared to 2017).**

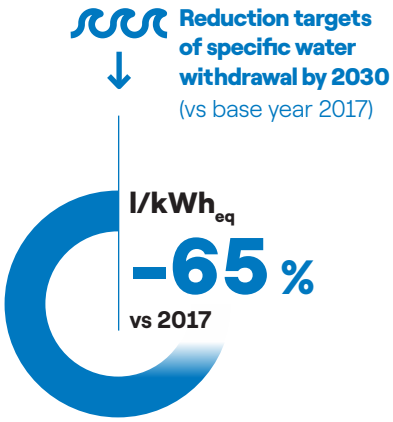
Water withdrawals by source 2021 (55.6 mil m^3)



The progressive reduction of water requirements is pursued by promoting, where possible, the recovery of wastewater. Particular attention is paid to the use of water in cooling towers, the efficiency of which is being increased by upgrading the control and recovery systems of the blowdowns, thus also reducing their environmental impact. Other optimization interventions carried out concern the use of crystallizers, a technology developed in the field of coal-fired generation that is in the pilot test phase on some combined cycle plants, with the aim of completely reusing wastewater in the power generation cycle. Finally, the collection and reuse of rainwater represents another important lever for reducing the environmental footprint of our power generation sites, thanks to the installation of appropriate storage tanks.

Specific water withdrawals (l/kWh_{eq})





Enel is also constantly monitoring all power generation sites located in zones at risk of **water scarcity** (water stressed areas) in order to ensure efficient use of water resources. Mapping of power generation sites falling within water stressed areas is done in line with the criteria of GRI 303 (2018) with reference to the conditions of "(baseline) Water Stress" indicated by the World Resources Institute Aqueduct Water Risk Atlas[19] and, beginning this year, will also include nuclear plants. Among the sites mapped, those defined as "critical" are those positioned in water stressed areas and which withdraw fresh water for process needs. For these sites, methods for manag-

(18) Water requirement is constituted by all the water withdrawal quotas from surface (including recovered rainwater) and groundwater sources, by third parties, from the sea and from wastewater (including treated wastewater) used for processes needs and for closed-loop cooling, except the quota of seawater discharged back into sea after the desalination process (brine). This latter item (brine) contributes to the quota of withdrawals.

(19) GRI 303 defines "water stressed" areas as those in which, based on the classification provided by the WRI Aqueduct Water Risk Atlas, the ratio (referred to as "baseline water stress", and indicating the level of competition among all users) between total annual surface and groundwater withdrawals for different uses (civil, industrial, agricultural and livestock) and the total available annual renewable water supply is high (40-80%) or extremely high (>80%). By way of greater environmental protection, we have also considered as located in water stressed areas those plants falling in zones classified by the WRI as "arid".

ing waters are analyzed for the purposes of minimizing requirements and maximizing withdrawals from sources of lower quality or which are non-scarce (wastewater, industrial or sea water).
In 2021, approximately 14% of the total energy generated by the Enel Group used freshwater in water stressed areas[20]. In these areas, withdrawals from scarce sources amounted to 15 Mm^3, with an increase of 36% compared to 2020 (11 Mm^3). In this case, too, higher withdrawals are related to the contingency of increased energy generation from thermoelectric plants in 2021. The percentage of water withdrawn in water stressed areas is **27%** of total withdrawals.
The robust expansion of the solar power plants, naturally destined for location also in water stressed areas, has brought to the fore a new use of water connected with the cleaning of dust deposits on the surfaces of photovoltaic panels. Although these volumes are not very significant, Enel has adopted innovative initiatives and solutions for these plants aimed at further reducing their needs.
The Enel Group's constant attention to monitoring and improving its water footprint is also testified by the WaVE (Water Value Enhancement) project, launched in 2020 by the Enel Green Power & Thermal Generation division, which made possible an assessment of the use of water resources in all thermoelectric and renewable power generation sites, and the consequent planning of specific innovative improvement actions, particularly in water stressed areas. The project continued in 2021, refining the mapping of assets with progressively greater granularity, also in view of the effects that climate change may have on the availability of water resources.

WaVE Project – Circular reuse of water in San Isidro plant

The combined cycle plant in San Isidro, Chile, composed of two units with a total capacity of 778 MW, vital for the electricity needs of the country, is located in a region with high water stress, subject to frequent and prolonged periods of drought. Reducing water use is therefore extremely important in order to preserve the resource and make it available to other local stakeholders, as well as to ensure operational continuity.
The plant has initiated a collaboration with other local stakeholders with the aim of recovering the blowdown waters from the evaporative towers for their reuse as process water in the mining industry. The project encompasses the operation of the towers at higher efficiency and lower water demand, with a saving for the plant of about 500 thousand m^3 of water per year. At the same time, the mining industry avoids the direct supply of freshwater, thus realizing an important example of circular economy able to bring benefits to all stakeholders in the catchment area. The recovered water is used in the mining process for grinding and transporting ore in a closed circuit in which it is recirculated until completely consumed.
The initiative is also synergic with the forthcoming activation at the plant of a ZLD (Zero Liquid Discharge) system, pilot tests of which are currently under way, which will make it possible to send the saline drains from the cooling towers not only to the mine, but also to the ZLD recovery plant.
The project is part of a broader schedule of interventions aimed at optimizing the use of water in the evaporative towers, which still represent one of the most water-intensive processes in our power generation capacity. These include the adoption in 2021 at the Ventanilla and Santa Barbara plants of the advanced chemical control systems already launched the previous year at the Pietrafitta plant, which will enable the towers to be operated with a greater number of cycles of concentration, reducing the need for make-up water.

(20) The percentage of energy generated in water stressed areas, as well as the percentage of water withdrawn in water stressed areas, is calculated by including thermal plants that use water from scarce sources.

San Isidro power plant (Chile)

Mechanized panel washing in the Panama solar plants

Photovoltaic power generation in Panama is distributed over 7 plants, consisting of about 375 thousand panels for a total capacity of 62 MW. The humid tropical climate, often combined with the presence of nearby sugar cane and oil processing plants, as well as vehicular traffic, lead the panels to get dirty and to require cleaning at least once a year in order to avoid possible degradation phenomena. Until now carried out manually, cleaning of PV panels has recently been improved and optimized by adopting a semi-automatic cleaning system with low water consumption, consisting of a motorized unit equipped with a special brush that extends over the entire surface of the panel and is able to slide along the entire length of the row of modules, allowing them to be cleaned in a single pass.
Compared to manual cleaning, water saving is estimated at 68%, corresponding to over 0.5 million liters of water during a normal year of operation. The initiative can be further enhanced in the future by providing for the storage and reuse of rainwater instead of the water currently supplied by wells, so as to reduce further the pressure on local water resources.

Optimization of wastewater treatment

Downstream of internal recoveries and reuses, wastewater discharged from the plants is returned to the surface water body. Discharge always takes place downstream of a treatment process that removes any pollutants present to a level where they will not have a negative impact on the receiving water body, in compliance with the limits provided for under national regulations and by operating permits.

Responsible and integrated management of water catchment areas

The activities of hydroelectric power plants are an important element of water management. These power stations, which do not contribute to the Group's water consumption in that the water withdrawn is completely returned to its source, provide a series of additional services for the community compared to the sole generation of renewable energies. Several power plants are in fact involved in the management, shared with the interested public and private stakeholders, manage the water resource for multi-purpose services ranging from flood control, drinking water and irrigation and firefighting services, to the management of river waste held by artificial dams, also including numerous cultural, leisure and nature-based initiatives, made possible thanks to the presence of the power plants. The reservoirs of hydroelectric plants also carry out a vital role in the response to the effects of climate change, increasing the level of protection of the communities subject to increasingly frequent severe flooding and to prolonged periods of drought. Management of the outflows from hydroelectric plants is done through specific programs to ensure the volumes of water required to preserve the ecological state of rivers (minimum vital water flows).

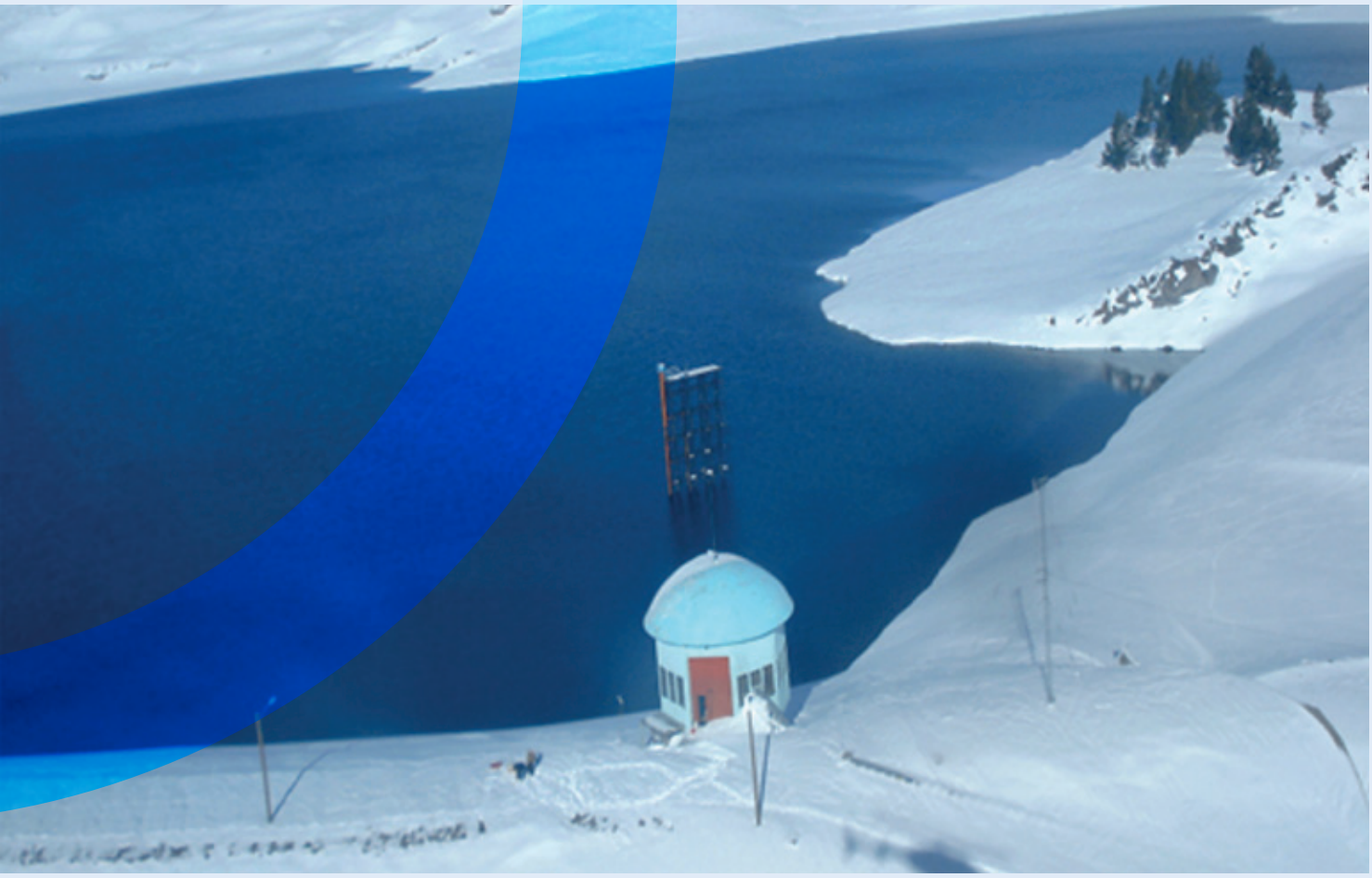
"Water: a shared heritage"

Multiple uses of water in Chile

Laguna del Maule is a volcanic area in the Chilean Andes in the province of Talca, whose easternmost foothills extend beyond the border with Argentina.
Since 1947, following an agreement with the Dirección General de Obras Públicas, which also allowed an increase in the capacity of the reservoir to 1,570 million m^3, Enel has effectively managed the water availability, in order to share its use for irrigation as well as for hydroelectric generation.
In fact, the waters of the Maule river and its tributaries are used for the generation of hydroelectric power in 4 Enel and third party power plants. Thanks to a monthly average flow rate of 25 m^3/s, Enel has generated an annual average of 330 GWh in recent years. At the same time, the waters of the Maule Lagoon have been used to irrigate agricultural land in the Maule region, supplying 67 agricultural associations and covering a land area of more than 200 thousand hectares.

The example of Colombia (fishing in the Bethany reservoir)

The Bethany Dam, built on the Rio Magdalena and located in the department of Huila, forms a reservoir with an area of approximately 7,400 ha and a volume of approximately 1,300 million m^3. The department is the main producer of fish nationally, accounting for 39% of Colombian production. The fish farming cage system accounts for 40% of Huila's total production and the fish farming sector is estimated to generate about 3 thousand direct jobs.
In 2020, Enel received authorization from the National Aquaculture and Fisheries Authority (AUNAP) to begin the process of seeding two sectors of the Bethany reservoir of Yaguará Santa Helena (SH) and Pacandé (PA) with fry of indigenous species. The fry come from the Experimental Station of Hydrobiological Resources built by Enel and managed by the SurColombian University, the first to obtain certification from the Colombian Agropecuario Institute (ICA) as a biosecure aquaculture establishment for indigenous species.



Energy efficiency

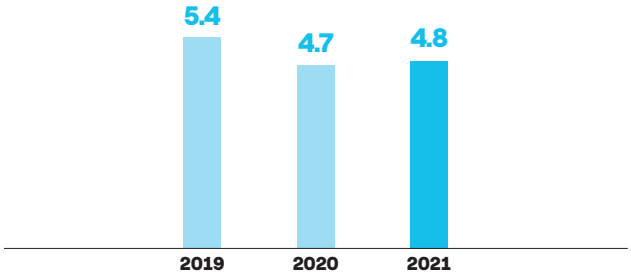
103-2 | 103-3 | 302-1 | 302-3 | 302-4

Energy efficiency in production processes

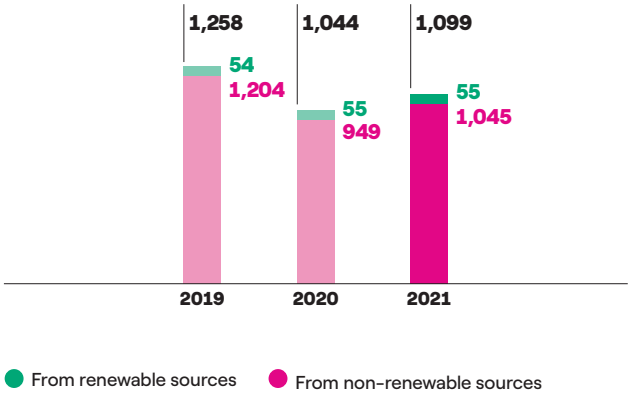
Using energy in an efficient manner is, for us, a constant commitment in the entire value chain, from generation to distribution; in particular, the strategy of reduction consumption entails capital expenditure to increase the energy efficiency of our activities, from interventions to maximize the output of generation plants to the operational improvement of the distribution grid, leveraging the diffusion of greater awareness in behaviors (see also the chapter "The path to Net-Zero"). Energy consumption is mainly represented by fossil fuels to operate thermal power plants (in 2021 71% was natural gas) and by uranium to operate nuclear power plants. A limited amount of energy consumption is related to the operation of renewable power plants (biomass and geothermal).

The overall direct consumption of energy for the production of electricity is 1,099,302 TJ (26.26 Mtoe). During the year, there was an increase in fuel energy consumption of about 10% compared to 2020, a difference that reflects the increase in thermoelectric generation (+16% compared to 2020) and, within that, the increase in gas-fired generation (+19% compared to 2020). The Group's **energy intensity,** which provides a measure of its operational efficiency, **in 2021 was 4.8 MJ/kWh$_{eq}$,** up approximately 2% compared to the previous year.

Energy intensity
(MJ/kWh$_{eq}$)



Fuel consumption by primary source
(,000 TJ)



2021 saw the continuation of process efficiency initiatives, followed by the implementation of operational excellence programs across the different Business Lines, both for operations and in buildings management. In particular, as regards the Infrastructure and Networks Business Line, the commitment to reduce network losses continued, also contributing to the reduction of CO_2 emissions. Among the actions to be taken are the progressive reduction of single-phase electric lines, the construction of new electric lines to lighten the load on the pre-existing ones, and the use of low-loss transformers. Other actions include boosting the grid by using conductors with a greater cross-section and rephasing primary transformer. Finally, the realization of new transformer cabins will help reduce the length of the low -voltage lines which are characterized by higher levels of loss. More broadly, optimizing the grid set-up will allow a significant reduction of its losses.

Energy efficiency in the management of buildings

In addition to operational sites, the strategic commitment to energy efficiency is fundamental in the sustainable management of our buildings and administrative offices. In order to pursue this objective in a structured and organic way, Enel has adopted a Workplace Handbook in which it has collected the measures and technical references recommended within the Company for the design, construction and management of workplaces. In the Handbook, particular attention to people and to the environmental, social and economic context in which they work is placed at the heart of every work environment. The environmental sustainability of each building, whether new or undergoing renovation, is pursued with reference to its entire life cycle, through the adoption of

circular[21], low-emission and sustainable materials and products, with an environmental footprint certified by tools such as the Life Cycle Assessment (LCA), the Environmental Product Declaration (EPD) or Cradle to Cradle (C2C) standard. Where possible, models such as sharing and product-as-a-service are favored, capable of increasing the utilization factor of the building and the equipment it contains. Priority attention is also paid to the reduction of waste and its reuse, the sustainable management of water resources, the containment and control of air emissions and noise, as well as air quality inside and outside the workplace, with the aim of minimizing the environmental impacts of the building at every stage of its life cycle. Finally, the commitment to sustainability is guaranteed by the achievement of LEED and WELL certifications for new buildings and for those under renovation, or by the request for such certifications in the case of rented buildings. For more details refer to chapter "Progress starts with people" of this document.
With reference to the specific aspects of energy efficiency, the adoption of technological solutions and energy management systems with continuous control, that can qualify the building as a "Nearly Zero Energy Building", is recommended. In particular, the choice of equipment with energy efficiency corresponding to the highest market standards, i.e. with Energy Star certification, and the adoption, wherever possible, of solutions for the generation and use of renewable energy, is indicated. These include the installation of photovoltaic or solar-thermodynamic plants, hydrothermal plants for exchange with groundwater or cogeneration/trigeneration or, finally, the connection to district heating/cooling systems, where available.

The project for redevelopment of the Enel office in Viale Regina Margherita (Rome, Italy)

The redevelopment project of the Rome Headquarters involves a facility with a total surface area of approximately 80 thousand m^2, capable of accommodating up to 2,600 people. Through the adoption of innovative principles of bioclimatic, sustainable and biophilic design, the project aims for excellent performances in terms of energy efficiency, circularity of resources and living comfort of the building, which will be subject to LEED and WELL certifications.
The renovation works, commenced in November 2019, will have an expected duration of about 40 months. Due to the urban context and high population density, each potential significant environmental impact has been subjected to management plans and dedicated control and mitigation measures, in compliance with all the limits imposed in the concession and best practice standards.

From **the energy point of view**, the high efficiency of the air conditioning systems, the LED lighting, the external walls made of highly insulating glass and the computerized management of the entire "building system" will make possible a significant containment of electricity consumption, which will be partly satisfied by the enhancement of photovoltaic self-generation, with an estimated reduction of about 50% in electricity drawn from the grid (approximately from 12 to 6 GWh per year). With regard to **water consumption**, the collection and full recovery of rainwater is expected, which, appropriately treated, will feed the vegetation watering systems, hydrants, evaporation towers and car wash services. **Regarding the production of waste**, during 2021 in particular a total of about 25 thousand tons were produced, of which around 98% (24.4 thousand tons) was destined for recovery.

(21) Please refer also to the chapter "Circular economy".

Energy efficiency and electrification products for customers

In 2021, the interventions carried out by the Enel X Global Retail Business Line in relation to efficiency, technological innovation and reduction of CO_2 emissions in the sectors in which the division operates, were strengthened and consolidated. In the public lighting sector, work performed in 2021 by Enel X in Italy, Spain, Chile and Colombia resulted in cumulative savings of approximately 153 GWh. In public transport, Enel X participated in the commissioning of more than 1,000 electric buses in Chile, Spain and Colombia. For its B2C (Business to Customer) customers in Europe and Latin America, in 2021 Enel X installed about 64 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 for its customers in Brazil and Spain in 2021 made possible a production of distributed renewable energy equal to about 10 GWh, in addition to the energy savings obtained by the cogeneration and trigeneration plants managed by the company in Italy and Spain.

Overall in 2021, **Enel X's efficiency and electrification products and services enabled its customers to avoid the emission of approximately 128 thousand tons of CO_2**, corresponding to the environmental benefit of more than 7 million equivalent 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.

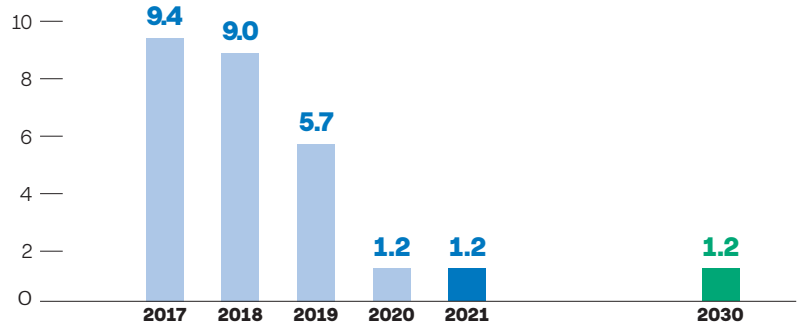
For further details, see the chapter "The decade of electrification and customer centricity".

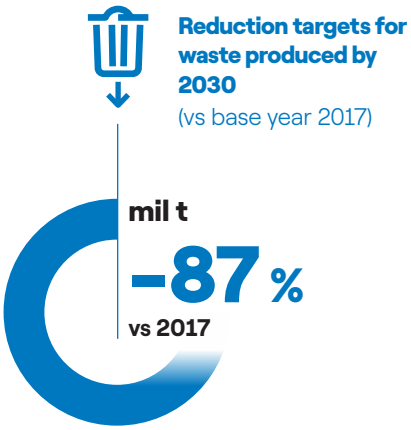
Waste management

103-2 | 103-3 | 306-1 | 306-2 | 306-3

Optimal waste management is a strategic objective of our environmental policy, which results in a constant commitment to a reduction in its production, as well as to the definition of new methods of reuse, recycling and recovery, in the perspective of a circular economy (more information is available in the chapter "Circular economy").
For the purposes of reinforcing this commitment even further, we have equipped ourselves with a **Group Guidelines for Waste Management**, which collects the best Company practices deemed fundamental for optimal waste management. In particular, Enel has set important **targets to reduce the amount of waste produced** (-87% of waste produced in 2030 compared to the 2017 base year[22]). The reduction target takes into account the results already obtained and of the predicted evolution of the production mix towards renewable energies, as indicated in the three-year Strategic Plan. The target value includes the technological upgrading of renewable power plants, especially wind farms, which will reach their end-of-life in the next few years. For this reason, although the target was already reached in 2020, it was decided not to change it in order to take into account the potential impact of upgrading activities on waste production in 2030.

Waste produced (mil t)*





* These targets exclude waste produced from the decommissioning of thermal plants.

During 2021, waste production remained constant compared to 2020, with a value at 2021 of **1.2 mil t (-87% compared to 2017)**. Waste sent for recovery across the Enel perimeter was around 62%, slightly down on 2020 (66%). The commitment to a continuous **increase in the percentage recovery of waste products** is fundamental to ensure an efficient transition towards a circular economy in order to minimize the exploitation of natural resources in accordance with sustainable objectives and in combating climate change. A key role in this area is played by the significant **recovery of process waste** from thermoelectric generation, significant, that is, in terms of the quantities produced and their characteristics, including coal ash and desulphurization gypsum, reused in the construction industry for the production of cement, concrete and bricks according to specific technical and environmental control requirements. In particular, the percentage sent for recovery is, respectively, 67% for coal ash (from 74% in 2020) and 81% for desulphurization gypsum (from 63% in 2020)[23].
Numerous other maintenance wastes from thermoelectric generation plants, such as waste oil, batteries and numerous metal scraps, including iron, copper and aluminium, as well as residues from primary filtration in hydroelectric plants, are also destined for almost complete recovery. A significant commitment is also directed at the recovery of waste **produced from demolition and dismantling of end-of-life power plants**, by using selective demolition techniques of the structures, as well as solutions to make the best use of the materials produced. Within the Enel Green Power and Thermal Generation division, the commitment made in 2020 with the launch of "Zero Waste" continued during 2021. This is a global project whose objective is to limit the environmental impact

(22) These targets exclude waste produced from the demolition of decommissioned thermal plants.
(23) The variations in the percentages of recovery compared to the previous year are due to plants decommissioned or shut down in the period.

of waste produced by the various plants and technologies in all the countries where the division is present. This is achieved through the reduction of the amount of waste generated and an improvement in the percentage of its recovery through the sharing of the best initiatives and best practices implemented by individual countries, which contribute to the definition of increasingly challenging objectives. Among the global initiatives carried out during 2021, the extension of the project to contractors who want to work with us, operating along the entire value chain, should be highlighted. In fact, a "sustainability K" factor has been introduced in relation to waste, through the definition of minimum requirements for participation in tenders and the adoption of additional bonus mechanisms that companies can activate optionally, should they be able to achieve higher levels of recoverability.

Particular attention was then paid to wind and solar technologies, in order to identify, as of now, possible strategies for the reuse of components that are subject to replacement or disposal throughout the life of these plants, an issue that we expect to become relevant from 2030, as anticipated. For wind technology, the "**Wind New Life**" project has been activated for the recovery of wind turbine blades, with a view over the next decade to gradually replacing components that will progressively reach the end of their useful life (around 2 kton/year in Italy). In addition to focusing on possible future recovery scenarios, the project has also involved analysis of energy reuse and recovery in the cement production process of the materials making up the blades, with overall recyclability values of the components of a wind turbine ranging from 80 to 85%. Details of further projects can be found in the chapters "Innovability®" and "Circular economy".

An increasingly greater effort has been made in particular to acquire, in a life cycle perspective, solid and comparable information on the **environmental impact of the substances and of products procured**. Similarly, **Extended Producer Responsibility (EPR)** models have also been adopted in relation to the **post-consumption phases of the products and services provided**. Of particular importance in this context was the commitment made by **Enel X** through its membership in Europe of consortia on WEEE, batteries and packaging, as well as the increasing attention paid to the design phase of the products marketed.

As regards the **waste generated by the management of grids**, recovery programs have been reinforced, in particular for dielectric mineral oils, used as insulation in electric equipment, and in the accumulators, utilized as energy reserve in transformer substations. These oils are sent to companies registered and authorized for regeneration and waste-to-energy treatment, where regeneration is not possible, whereas the end-of-life accumulators are sent to registered and authorized companies that can recover secondary raw materials. Particularly relevant are the results obtained by the projects launched across various countries for **the sustainable replacement of intelligent first-generation meters and the recovery of their constituent materials.** The meter is made up of around 65% plastic materials and the remainder is mainly iron (12%), copper (7%) and electronic boards (7%). These materials, appropriately recovered at authorized plants, become reusable resources in other production cycles. For further initiatives, see the chapters "Circular economy" and "Suppliers" in the present document.

2021 also saw the continuation of Enel's commitment to the elimination of single-use plastics within the Group, initiated with the launch of the "Zero Plastic" project in June 2019 to coincide with World Environment Day. The project, which encompasses the gradual abandonment of disposable plastic, has involved the offices of the main headquarters (with more than 20 employees) in Italy and Spain, and is gradually being extended to the other countries where the Group is present. Despite the continuation of the pandemic, in 2021 the reduction of disposable plastic in offices (including cafés, canteens and beverage and food dispensers) can be estimated at 75% in Italy and 65% in Spain compared to the year of reference (2018), thanks to interventions for the replacement of the products supplied and the installation of water dispensers. It was not, however, possible to carry out actual measurements, due to the prevalent recourse to home working for personnel in the large offices as a response to the Covid-19 pandemic. Furthermore, precisely in view of possible specific health security requirements to be adopted as precautionary measures on the return to work of staff, however partial, the targets previously set for the following years have been appropriately updated, while awaiting a complete return to working normality.

The pandemic linked to Covid has also produced the appearance of a new type of waste in operating workplaces kept active for electricity service continuity needs. It is made up of mandatory personal protection devices (face masks and disposable gloves) distributed by the Company in all workplaces in order to prevent the spread of the contagion. Management of this waste was based everywhere on principles of maximum precaution, in line with the development of health provisions and requirements issued in the different countries.

Zero waste

In May 2021, the Spanish distribution company e-distribución, first among all Spanish DSOs (Distribution System Operators), obtained the "Residuo Cero" certification issued by Aenor, a leading certification body. The certificate is issued to organizations that evaluate the different fractions of waste, avoiding disposal in favor of recovery. The generation of waste is not, therefore, eliminated, but the method adopted by the organization to reduce its production and ensure its reintegration into the value chain is recognized and duly certified. More specifically, for e-distribución the award of the certificate implies the optimization and complete traceability (collection, transport and delivery) of waste, from the site where it is generated to the treatment plant. Also for e-distribución, the certification attests that the waste generated in the autonomous community of Aragon and in the towns of Castile, León and Galicia has been optimized in order to give it a second life.

Protection of soil, subsoil and groundwater

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Enel is committed to the continuous application of the most advanced technologies available and of best practices to minimize the possible environmental impacts deriving from its activities, using international standards as a benchmark even where the required environmental protection is less stringent. Among the areas of prevention, the highest level of attention is paid **to the protection, monitoring and remediation of soil, subsoil and groundwater** in the areas where plants and generation and service facilities are present in all countries.

The protection of these environment matrices guides all phases of their life, from design choices to construction, operation and end-of-life management. Both active and passive protection and safety measures will be used in project phase to prevent any possible form of uncontrolled or accidental contact of potentially polluting substances (fuels, reagents, liquid and waste flows) with soils and subterranean waters.

During plant operations, every process undergoes compliance controls as well as ongoing upgrades as required by the Environmental Management Systems to prevent and minimize the risks of any potential environmental contamination. At the same time, control plans are executed to monitor the condition of the previous environmental matrices. In the event of an accident, for example the accidental spillage of polluting substances, the timely application of the Stop Work and Emergency Management Policies allows elimination of any possible environmental impact, rigorously complying with the provisions and the legal obligations of the various countries.

For management of the end of life of power plants, once they have been secured and prior to their being dismantled and the area reassigned to new development projects, Enel proceeds, according to the authorized provisions and legal requirements of the various countries, to verify further the environmental quality of the soil, subsoil and groundwater in the areas where the plant is located. In the event of potential contamination phenomena, characterization of the environmental matrices in the areas potentially affected and, if necessary, implementation of safety measures and subsequent remediation, are executed according to intervention plans shared with the competent authorities and by resorting to specialist, qualified companies able to restore promptly the level of quality suitable for the intended use of the area (industrial/commercial, residential). Particular focus is on power plants falling within the large industrial hubs.

In order to mitigate further the risk connected to the detention and consequent potential uncontrolled release of substances that can have an impact on the environment, numerous projects have commenced for their progressive substitution, for example, verifications under way on the use of vegetable (hence biodegradable) oil, replacing the traditional dielectric oil of mineral origin.

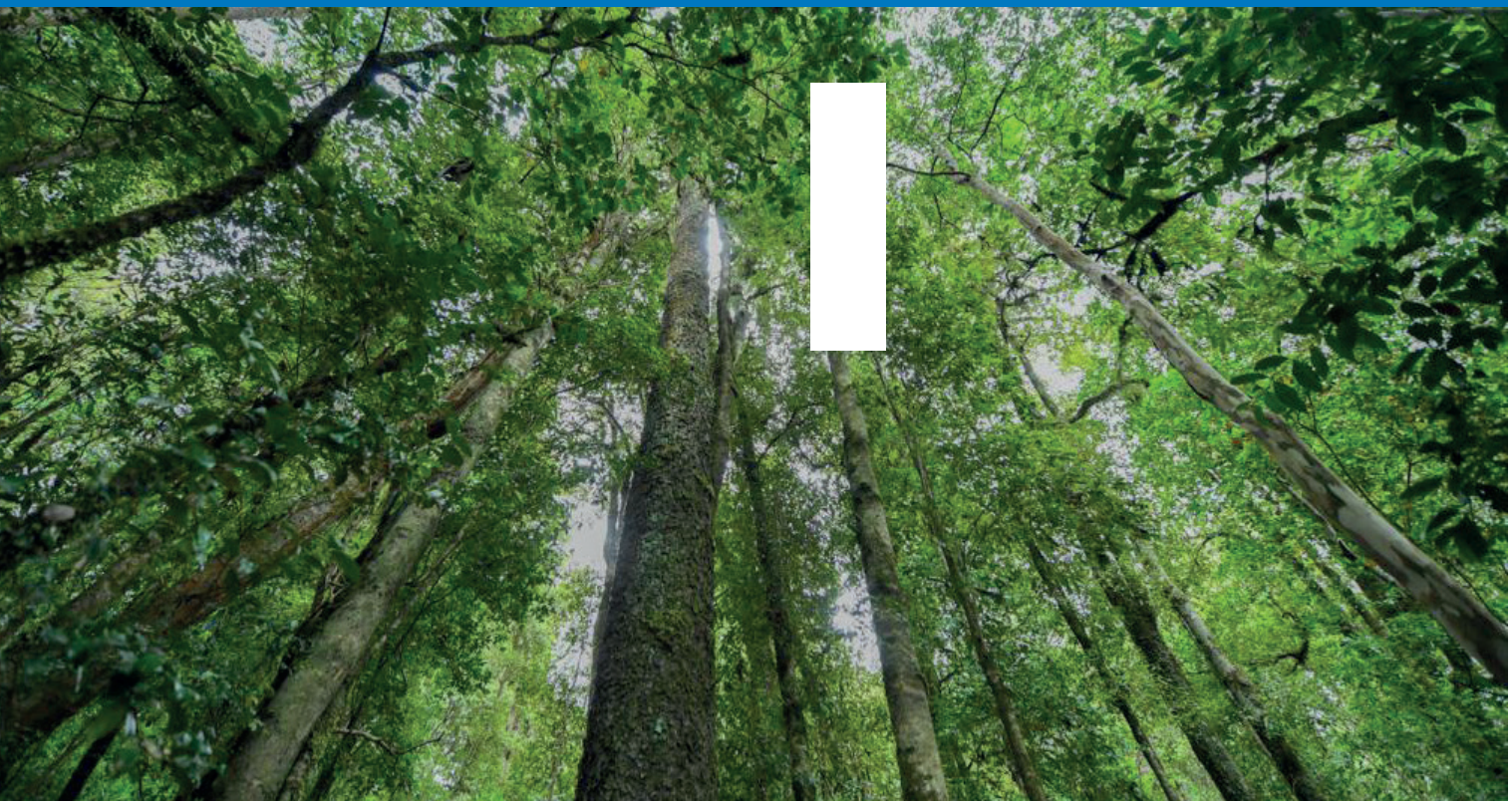
New use of industrial sites

Reclamation of the Augusta site

The Augusta site falls within the wider area of national interest for the reclamation of Priolo in Sicily. In this context, as early as 2003-2004 site characterization and consequent reclamation procedures were initiated following the identification of soil contaminated by hydrocarbons. The soil remediation procedure, agreed upon with the authorities, encompassed the construction of an impermeable diaphragm wall along the entire perimeter of the contaminated area, the treatment of the soil using soil washing and biopile techniques, and subsequent re-use of the remediated soil. The remediation work was completed in 2011 with the return of the land concerned to its intended use, while *post-operam* monitoring continued until 2016. A photovoltaic plant is to be built on the reclaimed area. After the closure of the plant, which took place in 2019, the overall characterization plan of the area was presented and is currently awaiting approval. Among the proposals under consideration, one is the development of a "remediation hub", a research and study center aimed at identifying innovative solutions for the mitigation of environmental impacts caused by plants and infrastructures.

Teruel Power Plant - Preparing for new uses

The Teruel site is located in the autonomous community of Aragon, Spain, and is home to a coal-fired power plant that received authorization to cease operations in June 2020. The Teruel plant repurposing project involves the development of a combination of renewable energy generation facilities (solar, wind and battery storage). This has made it possible to optimize the demolition project with respect to the future use of the site, anticipating the characterization of the soil and groundwater in the area affected by the installation of the photovoltaic plant in the zone previously occupied by the coal house, without having to wait for the completion of the demolition of the plant. The results of the risk analysis already prepared showed an acceptable level for all uses, without the need for further action.



Other activities

Enel X: e-mobility

During 2021, Enel X proceeded with an important development of the e-mobility Emission Saving tool, developed to provide evidence of the division's commitment to sustainable mobility through the electrification of the vehicle fleet in circulation. The algorithm, already capable of calculating the CO_2 avoided, the equivalent trees per year and the pollutants saved in the use of an electric or electrified vehicle compared to one powered by a traditional endothermic engine, was enriched in 2021 by the addition of the calculation of noise and avoided costs to health and environment.

The new e-mobility algorithm Emission Saving tool 4.0 has been verified and validated by an internationally recognized certification body (RINA) in accordance with the principles identified in the UNI EN ISO 14064-2:2019 standard.

Enel X has therefore calculated the reduction in the level of environmental noise obtained thanks to the adoption of the electric-powered or plug-in vehicle in purely electric mode, compared to internal combustion vehicles, both non-rechargeable hybrids and purely thermal. To do this, it relied on CEDR[(24)] studies, which showed a clear reduction in noise emissions between 20 and 50 km/h. Above this speed, in fact, the noise derived from the rolling of tires and from aerodynamic penetration of the vehicle makes noise emissions comparable, regardless of the type of power supply, whereas below 20 km/h battery electric vehicles (BEVs) are equipped with acoustic devices that facilitate their detection by pedestrians. The results showed that, by adopting a conservative approach for a quick evaluation of the "gain" obtained from using electric vehicles, an overall noise reduction of 3 dB(A) compared to internal combustion vehicles can be considered, corresponding to 50% less noise related to vehicular traffic. The use of an electric vehicle (EV) in purely electric mode instead of an internal combustion vehicle (HEV/ICEV) is therefore equivalent to halving the vehicular traffic in terms of noise pollution.

Enel X has therefore quantified the savings in air and noise emissions related to the recharging services provided. January 2018 to December 2021 saw over 3.6 million recharges at Enel X stations across Italy; approximately 46 mil kWh was delivered by the charging stations and about 273 million km were traveled by electric vehicle owners. Compared to 2020, there has been an increase of over 100% in the energy supplied by the recharging stations, with a consequent doubling of CO_2 savings thanks to the greater diffusion of both electric vehicles and Enel X's connected public and private recharging points. The emission of about 33,400 tCO_2 has been avoided, corresponding to about 1.8 million equivalent trees per year, as well as about 82,400 kg of NO_x and 2,500 kg of PM_x. The noise avoided is equivalent to an annual reduction of 52,200 HEV/ICEV cars.

Environmental legal disputes

103-2 | 103-3 | 307-1

At December 31, 2021, the number of legal proceedings pending was 243 across the whole Group. The main environmental disputes related to Italy, Latin America and Iberia.

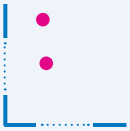
The total amount of fines issued to Group Companies in 2021 was about 5 million euros, primarily in Spain in relation to network operations of Edistribución Redes Digitales, and secondarily in Brazil.

(24) "Noise emission of electric and hybrid electric vehicles" - CEDR (Conference of European Directors of Roads).

Innovation

| 102-15 |

Priorities



F Economic and financial value creation

N Innovation, circular economy and digital transformation

Plan

GROWTH ACCELERATORS

- Innovation

SDG

Targets

Activities	2021-2023 targets	2021 results	Status	2022-2024 targets	Tag	SDG
• Further enhance the reach of our innovation ecosystem, to find the best solutions on a global scale • Generate value by solving the ever-increasing needs of the Business Lines, by enabling open innovation tools (collaboration with start-ups, crowdsourcing, partners, universities, intelligence, technological communities, solution design activities)	Launch of **350** Proof of Concept to test innovative solutions in the period 2021-2023	**168** Proof of Concept launched		Launch of **520** Proof of Concept to test innovative solutions in the period 2022-2024	I S G T	9 17
	Scale-up of **100** solutions to accelerate the implementation of the Strategic Plan in the period 2021-2023	**46** solutions adopted in the business		Scale-up of **137** solutions to accelerate the implementation of the Strategic Plan in the period 2022-2024	I S G T	9 17

Goals

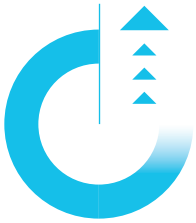
I Industrial E Environmental S Social G Governance T Technological

New Redefined Outdated

Status

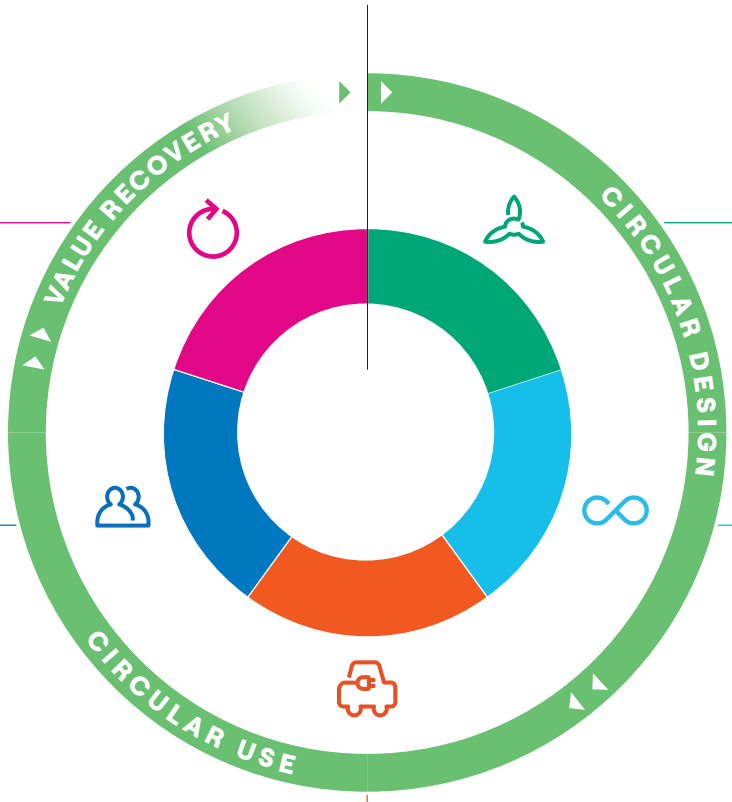
Off track On track Achieved

Circular economy



62%

Circularity Improvement Index



New life cycles

All solutions designed to preserve the value of an asset at the end of its life cycle thanks to reuse, regeneration, upcycling or recycling, in synergy with other pillars.

Circular inputs

Model of production and use based on renewable inputs or inputs from previous life cycles (reuse and recycling).

Sharing platforms

Systems for joint management by multiple users of products, goods or skills.

Extending useful life

Approach to the design and operation of an asset or product intended to extend its useful life, such as modular design, facilitated repair or predictive maintenance.

Product as a service

A business model in which the customer purchases a service for a specified period of time, while the company retains ownership of the product, maximizing usage and useful life.

Achieving a sustainable economic model requires a profound transformation to meet the objectives Enel has set itself, and the circular economy represents a real strategic driver and growth accelerator. With this in mind, for years we've been working to constantly rethink our activities, leveraging innovation not only in terms of technology but also in business models, across the whole value chain. We have also been revisiting various internal Company processes with a coordinated approach, supported by solid material and economic metrics.

Adopting a circular approach means decoupling business and resource consumption by reducing the use of finite natural resources, avoiding waste and maintaining the value of goods and materials. This way we can create environmental benefits not only in terms of reducing emissions throughout the value chain, but also by lowering all kinds of impacts, from the consumption of natural resources, including water, through to waste generation and the loss of biodiversity.

We need to leverage all pillars of the circular economy: reducing the consumption of non-renewable resources and maximizing the value of those already in use and of the goods produced, and extending their life by recovering resources at the end of their lifecycle. Moreover, shifting from a linear model to a circular one, i.e. from a model based on resource extraction, production and consumption that is strongly reliant on automation, to one based on maintaining the value of products and goods through design, repair, service, reverse logistics and recycling, allows for much higher value to be placed on human labor.

In this context, digitization becomes an enabler of circularity, by developing initiatives for circular management of IT assets (e.g. life extension and reuse of devices, product as a service models, such as the cloud for data center management, etc.), as well as digital solutions to support circular business models (such as machine learning techniques geared towards predictive maintenance, digital management of information on materials, etc.).

Lastly, the circular economy provides opportunities in terms of business competitiveness thanks to a better use of resources, lower risks tied to the dependence on raw materials (critical resources[1] in particular) and extended supply chains, new revenues associated with services and asset enhancement, and a constant focus on innovation in each area of activity.

The governance of the circular economy

To ensure an organic and effective circular transition and strategy implementation, specific areas have been created in Enel's various Business Lines and geographical areas, coordinated by a Holding area so as to ensure a coordinated approach towards strategies, to share knowledge and experience and to help integrate circular economy principles into daily choices and activities. In particular, the Business Lines are redesigning or developing business models with a circular approach, while the units at country level are providing support locally to create new business opportunities in collaboration with the local ecosystem.

Group circularity targets and indicators

One of the main challenges for the effective implementation of a circular economy model is setting criteria and metrics to be able to distinguish between circular and non-circular solutions, measure their environmental, economic and social impacts, set objectives and understand the levers for improvement.

The Group's commitment to measuring circularity began in 2017 when it developed a metrics model, the "CirculAbility® Model", which takes into account all five pillars of the circular economy i.e. circular inputs, product as a service, sharing platforms, life extension, and new life cycles, taking a quantitative approach in both the material and energy components. The model was shared with other companies and institutions so as to make a proactive contribution to the dialog, becoming a key point of reference in this area. To date, its application is being extended to company assets, suppliers and end customers.

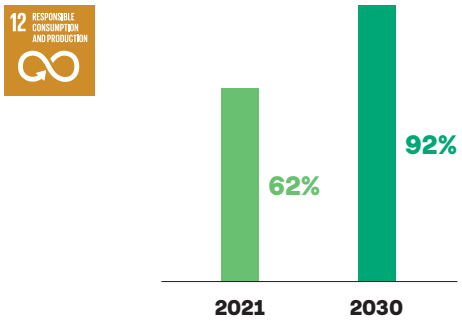
In order to accurately measure circularity, the Group is increasingly analyzing how its resource consumption is evolving in its various business activities. In line with the resources' productivity indicators, established also by Eurostat, we measure the consumption of material by service for its entire service life. In terms of generation capacities, the consumption of resources throughout the life cycle of the production plants is measured: from the raw materials extracted through to the materials consumed as well as the energy used in the manufacturing, operation and decommissioning phases. This aggregate value is then compared to the energy produced over the entire service life.

We have set ourselves the target of improving circularity by 92% by 2030 (compared to 2015) for the whole-life consumption of materials and fuels in our power generating capacity. This circularity indicator is associated with the electric generation park and is an addition to the existing indicators on direct emissions, making it possible to monitor the evolution of the whole-life material consumption per MWh generated over the years, measuring consumption along the entire life cycle: from generation up to the decommissioning of the generation assets.

(1) Defined as "critical" (or essential) for the user country's economic system and the supply risks tied to the geographical focus (and respective geopolitical risk) of the various stages of the supply chain. These kinds of lists are published by the United States, Japan, the European Union and Australia for example.

The Group's circularity performance is analyzed in terms of its contribution to the main environmental indicators (emissions, water consumption, resource consumption) and the Group's economic performance. More generally, as the circular economy is also closely tied to the creation of economic value and not just environmental value, we are also working to establish hybrid metrics, such as "Circular EBITDA", which can be correlated to both aspects – analyses and results that are periodically presented to Top Management.
For all Group investments tied to the development of physical assets, a circularity KPI is assessed, which takes into account whole-life material consumption compared to industrial performance (energy produced in the case of power plants for example).

Circularity Improvement



The involvement of the ecosystem

A circularity-based business model requires the utmost collaboration between all players involved. That's why we consider it essential to open up to dialog with parties who share this vision, involving the supply chains and promoting common initiatives to safeguard natural resources and boost the ecosystem's competitiveness. Indeed, a circular solution cannot be found by looking only within a company or its area of activity; rather it is necessary to explore synergies with other areas that the company has perhaps never interacted with in the past.
Enel is part of a global coalition, the Capital Equipment Coalition, which engages leading companies on the topic of circular economy. Since 2017, together with many other Italian companies from different sectors, Enel has also launched the Alliance for the Circular Economy, and in 2020 it launched a similar initiative in Spain. Enel is also present and active in several networks such as Ellen MacArthur Foundation, European Remanufacturing Council, and the Italian Circular Economy Stakeholder Platform.

To fully develop a circular business, it is necessary to adapt the way we relate to the outside world, and to review our usual negotiation and contractual models and the typical figures of a legal system that had previously been geared towards an economically linear world. In 2021, in order to identify and remove regulatory or negotiation barriers to circularity, we launched an in-depth regulatory-contractual analysis in collaboration with the legal Functions of the Business Lines and countries. We aim to identify innovative contractual solutions and standards to support circular business models and, if necessary, put forward proposals for regulatory interventions to help develop the circular economy in the various countries. This can be achieved by enhancing the value of existing goods and products, supporting new models such as recycling, and through product as a service or sharing, to unlock new development potential in terms of new business opportunities and new professional skills.

A new circular culture

A transformation such as the transition towards a circular economy model also requires a commitment in terms of new skills, work methods and integration. We use our experience and knowledge to create informational and educational content to share with stakeholders both inside and outside the Company.
We organize internal training and information activities, such as the Circular Economy School, which engaged about 430 Enel people, staff and Business Lines in Europe and Latin America, each lasting two weeks. The topics covered cut across various professional areas in order to fuel a discussion on technological, process, business model, contractual, regulatory and institutional issues, etc. The first "Circular Economy Open School" was also held in Latin America (8 meetings between June and November), which was attended by Enel staff and over 200 external guests. Various communities were also created to support activities and promote the culture and best practices of the circular economy across all areas. The communities were given thematic webinars (cities, social impacts, finance, etc.)

to support their participation in the activities. In total, more than 1,000 participants were involved in the programs.
Another key element is e-circular, an in-house company platform to promote people's "circular" behavior, thereby helping to connect at a personal level what the Group is doing in its business. The platform can be used to offer goods, search for items and make skills available. Moreover, e-circular is a reference point for all of the circular culture initiatives we are promoting through information, news and multimedia content.
Lastly, Enel puts young talents to the test on the circular economy and innovation by way of two programs, which involved more than 8 thousand young people in 2021:

- PlayEnergy, directed outside the Company, involves young innovators between the ages of 7 and 18 to seek solutions for a better future, making use of their creativity and imagination;
- We are Energy, a program targeted exclusively at the children (aged 7 to 18) of Enel people in all countries where we operate. The 2021 edition, entitled ReciproCity, focused on circular, inclusive and sustainable cities.

Energy transition and raw materials

While the transformation of the energy system will reduce fossil fuel consumption, it will also require the use of up to six times more minerals in 2050 compared to today. The new technologies will in fact require "traditional" materials such as steel, copper or aluminum, as well as previously less used raw materials, the so-called critical materials[1], such as lithium, cobalt, rare earths and especially silicon used in photovoltaic modules.
We are committed to significantly reducing resource consumption by 2030, even though the use of non-combustible raw materials is set to increase in the coming years (see the "Group circularity targets and indicators" section in this chapter). Adopting a circular and sustainable model as an integral part of the energy transition process will allow us to lower our dependence on raw materials as much as possible, particularly on critical raw materials[1], ensuring not only the competitiveness of the business model, but also full social and environmental sustainability across the chain.
Since 2020, an *ad hoc* working group has been set up, involving all of Enel's relevant areas, to constantly update the strategy, set priorities and targets, guarantee an integrated approach to the issue, develop skills, and ensure an extensive implementation of projects throughout the chain to achieve the set objectives. In particular, the working group has specific areas of focus, such as analyzing the supply chains of raw materials, defining a homogeneous taxonomy of materials and raw materials, identifying environmental and social impacts throughout the value chain (particularly in relation to human rights) and adopting solutions to ensure sustainability, ranking raw materials by priority and making *ad hoc* plans for key materials, defining strategies to reduce geopolitical, commodity, environmental and social risks, as well as new technologies and business models. All these focus areas are carried out by comparing and examining the best practices of each industrial sector, monitoring and analyzing the market trends associated with raw materials for key technological sectors (wind, solar, batteries, networks, etc.) and by collaborating regularly with all relevant stakeholders.
This involves rethinking all phases, identifying renewable or recycled raw materials and assessing whether to replace the most critical materials with new ones. The plants must be designed in such a way as to extend their life, by identifying models of use to make the most of the plants, and regenerate those at the end of their service life. Where this is not possible, the raw materials must be recycled and reused, considering also the key role of digital infrastructures.
To achieve these goals, Enel is carrying out a major plan of activities with its suppliers, the innovation ecosystem, companies and major institutions.
A number of innovative projects have also been carried out to use second-life batteries from the automotive sector or in power generation plants (Second Life Battery Project in Melilla) or to create energy storage systems (PIONEER project) for example. The Photorama project aims to automate the process of dismantling solar panels and recovering valuable materials. New smart meters are also being designed and manufactured using materials recovered from replaced smart meters at the end of their lifecycle (Circular smart meters).
In terms of institutional partnerships, in July 2021 Enel was the first utility company to join the European Raw Material Alliance (ERMA) – an initiative launched by the European Union in late 2020 to ensure access to all raw materials needed to achieve the vision of Europe's **Green New Deal**.

Circular cities

Enel has been working on the topic of circular cities for some years now, with the awareness that cities' evolution towards circularity does not depend on individual technologies or individual sectors, but requires a cross-cutting vision, integrated strategies, clear economic, environmental and social objectives, as well as open governance.

Cities are in fact responsible for approximately 80% of global GDP, and are also the areas where global challenges are most critical, since they contribute to more than two thirds of emissions and of the world-wide consumption of natural resources, and produce half of the planet's waste, with trends continuing to rise as the urban population is expected to grow through to 2050.

According with the circular city approach, technologies and innovation play a central role. Solutions ranging from renewable energies through to transportation electrification and building consumption, from digitalization through to the way people use them, can help introduce a new paradigm that's capable of lowering global and local environmental impacts and improving the quality of life for citizens by enabling access to new services and job opportunities. However, technology alone is not enough; it must be part of an overall and integrated vision of how the city should evolve, one that engages all stakeholders and translates into clear and concrete benefits for citizens.

For this reason, Enel's contribution towards this vision of the city is not limited to business solutions and services, but is also aimed at building knowledge, collaboration and sharing on the issue with institutions and all entities working towards the same goal in the urban context.

Bearing in mind how important it is to engage cities directly and for them to take responsibility in leading the transition, in October 2021 Enel (together with CEPAL and IILA) backed the creation and launch of the "Declaration of Circular Cities of Latin America and the Caribbean" to encourage the participation of cities wishing to accelerate their transition towards a circular and more sustainable urban model. To date, the Declaration has already been signed by four capitals (Lima, Santiago, Buenos Aires, Mexico City) and many other cities in Latin America, demonstrating the importance placed on the circular approach in local development policies.

In 2021, Enel also published the fourth edition of the study on circular cities, which was carried out with the Enel Foundation and Arup to highlight – by analyzing possible circular interventions in the main sectors of urban life – the impact of adopting circular economy principles in cities in terms of reducing emissions and improving quality of life and resilience. The study "Circular Cities - Decarbonization and Other Benefits" is available at: https://www.enel.com/content/dam/enel-com/documenti/azienda/storie/circular-cities_december2021.pdf.

Circular activities throughout the value chain

In order to systematically apply a circular approach, Enel is working across the board, through all of its business areas, to involve suppliers and customers and ensure a structured and effective approach when rethinking its business model. The main areas of activity are supplier relations and asset and customer management.

Suppliers

Enel's circular procurement strategy is divided into the following steps:

- engaging suppliers: including rewarding K-factors or requirements in the bidding phase to increasingly engage suppliers in their transition towards the circular economy;
- setting metrics and measuring environmental impacts of what is acquired, using the Environmental Product Declaration (EPD) and developing IT systems to provide support. At global level, approximately 200 suppliers are currently involved in 13 strategic product categories, accounting for more than 50% of the expense for purchasing materials; certification is being applied (Carbon Footprint, for example) for the remaining categories, works and services;
- co-innovation: launching projects with suppliers to jointly redesign the lifecycle of goods, including by modifying customer requirements.

Asset

The circular approach is applied through all of the main phases of assets' lifecycle (power plants, electrical grids, etc.): from the planning (design and input material selections), implementation (management of construction site phases) and operation (maintenance geared toward extending their service life) through to decommissioning (management of areas, equipment, materials and infrastructures to identify new lifecycles through reuse, upcycling, remanufacturing, recycling, etc.).

Enel Green Power and Thermal Generation

The value chain of the main technologies tied to the energy transition (such as photovoltaics, wind energy and energy storage) is being redesigned by working on the circularity of input materials and identifying solutions to maximize the value recovered at their end of life.

Solar

At our 3SUN factory, we are experimenting with the possibility of introducing recycled materials into the production process, including by completely overhauling the photovoltaic module to increase its circularity. We are designing panels with above-average conversion efficiency in order to reduce the amount of materials consumed and the amount of land occupied per kWh of energy produced. The recycling rate of photovoltaic modules is already one of the highest out of the electrical and electronic equipment available on the market, with recovery percentages of their materials (glass, aluminum and copper) ranging from 80% to 90% of the total weight of the module itself. Existing recycling technologies, however, do not yet make it possible to recover the more precious or rare elements contained inside the modules, such as silicon or silver. This is why Enel is investing in innovation projects to test new technologies for recovering the most precious or rare elements. These projects will not only further increase recycling percentages to close to 100%,

but will also regenerate high-quality, pure materials with high added value, which can be reused in industrial processes, thereby reducing the need to extract new natural resources.

Wind

In order to make the wind power industry more circular, we are working with start-ups and major players to promote the development of new, more sustainable, high-performance and recyclable materials. For example, we are studying new wind turbine towers made entirely of wood, which are lighter, easier to transport and make a negative contribution to CO_2 emissions, as well as new models of wind turbine blades using textile materials typically used in the nautical sector. Around 90% of a wind turbine is made up of metal, which can be easily recycled. Blades, on the other hand, are made mainly of composite materials, and recovering them is not currently very effective or efficient due to the lack of an established supply chain for both the reprocessing of this type of waste and the subsequent reuse of potentially recoverable materials. For this reason, we are evaluating innovative technologies to reuse wind blades at the end of their service life, exploring cross-sectoral collaborations, such as the possibility of reusing materials recovered from the construction sector.

Energy storage

Projects are being rolled out in the field of energy storage systems to identify innovative technological solutions and alternatives to chemical storage that could mitigate the consumption of critical materials, such as flow batteries, new chemicals not based on critical materials, new non-electrochemical storage technologies. Innovative technical solutions to extend the life of batteries are also being tested, such as Second Life Battery Project in Melilla. Pilot plants are also being designed to systematize and promote battery recycling, such as the Compostilla project, which aims to construct an industrial-scale pilot plant to recycle automotive batteries on the site of a decommissioned thermal power plant in Spain. The plant will have to address the logistics phases of collection, selection and directing of batteries for immediate reuse or disassembly, where the batteries will be treated and disassembled to extract valuable materials such as cobalt, nickel and lithium that are suitable for use in the battery production cycle.

Energy transition and raw materials

"The technologies we need to decarbonize the planet must also be sustainable in terms of raw materials. To make this possible, we apply the circular economy throughout the goods' lifecycle: from the design or purchase stages through to their use and then reuse in a new cycle at the end of their service life. For batteries for example, we can extend their life further with the Melilla project, and then recover the materials to use them in new batteries."

Nicoletta Dante

Head of Circular Economy Projects & Initiatives

Global Infrastructure and Networks

In 2021, the two main areas of focus were to include a circular approach in the design phase, and to regenerate materials from end-of-life assets.

Circular by design

Right from the earliest stages of the network asset planning, a "circular by design" approach was adopted so that the design of the assets and materials used could be revisited with a sustainable vision. This approach has made it possible to experiment with new solutions to ensure lower consumption of polluting materials, including cement.
Solutions were explored in Chile and Colombia where concrete recovered from old poles served as the basis for generating new poles to be installed from 2022. In Brazil, Colombia and Spain, the project to decontaminate oil from PCBs and regenerate it for use in the grid or other industrial supply chains continued into 2021, leading to a profit of 2.63 million euros and savings of 3.8 kt of CO_2, extending the service life of existing assets.

Grid mining

In order to maximize material recovery at the end of the lifecycle, Enel is applying a strategy called "grid mining", which considers grid assets as a 'mine' of materials that can be recovered and reintroduced into the production cycle.
Starting with the analysis of the value chain, new business processes are being geared towards recovering precious and rare metals from obsolete infrastructures. The goal is to minimize environmental impacts by aiming to reuse and regenerate materials at the end of their service life, maximize positive impacts at a local level, and create open ecosystems to boost the solutions' scalability. To this end, we are working to develop a materials passport and improve the tracking system for disused assets to improve their end-of-life management in terms of economy and circularity. This has paved the way for the end-of-life material sales initiatives, generating revenues of around 27 million euros and CO_2 savings of around 48.8 kt by 2021.
The first grid mining project was the "Circular Open Meter", launched in Italy and Brazil, recovering polycarbonate from decommissioned meters to create new ones. As part of the plan to replace first-generation meters, 80,000 pieces of Circular Open Meters were produced in Italy by 2021. The successful experience of the circular smart meter has also led us to weigh up the possibility of reducing the use of virgin material, and using the same material from the meters to design new street boxes, thanks to the challenge launched last year on the Open Innovability® platform where 3 out of the 71 solutions received awards.
The new goal is to open up our mine also to the outside world by making it available to other companies or different sectors so as to involve their respective production chains, feed new markets for raw and secondary materials, and promote local development and new job opportunities with initiatives for recovering waste materials (see also the chapter "The decade of electrification and customer centricity").

Global Energy and Commodity Management

A new operating model has been launched which Global Energy and Commodity Management is applying in its various Business Lines to improve asset management strategies with a view to circularity, both from a financial perspective and in terms of traceability and cycle closure indicators.

Projects with a greater innovative impact are running alongside our business-as-usual activities. These include the waste management project in Spain and the decommissioning of thermal plants in Italy. In 2021, the first pilot projects began in Spain, producing more effective uses for almost 100 thousand tons of recovered material.

Customers

We engage customers on one hand by offering them products and services that are increasingly circular and, on the other, for industrial customers and government bodies, by helping them measure and improve their own circularity.

Enel X Global Retail

In 2021, Enel X Global Retail continued its efforts to spur the market towards high standards that may serve as an example and driving force for other companies, both suppliers and customers.

Sustainability Boosting Program – Circular Economy Score

Enel X Global Retail provides special innovative consultancy tools to support companies and government bodies with establishing and implementing sustainability paths. The entire process – which is unique in terms of its completeness and innovation – is called the "**Sustainability Boosting Program**" and is aimed at promoting circularity and social inclusion.

The starting point of the Sustainability Boosting Program as for circular economy is the **Circular Economy Score**, which measures the starting level of circularity of the solutions in the portfolio. By the end of 2021, more than 50 solutions in four countries had already been assessed. The calculation method is based on the CirculAbility® Model and is being updated to take into account the provisions of the LCA (Life Cycle Assessment). For each product, the supply chain that precedes and follows it is analyzed to identify measures that can boost the circularity of the product itself. This is followed by the "circular intelligence" phase (analysis of the market context, scouting for innovations and start-ups) to identify opportunities to boost the circularity of the various solutions, which ultimately completes the Circular Economy Boosting Program. One application was the JuiceBox – Enel X Global Retail's private electric re-

charging solution – which resulted in a process being established to reuse plastic from disused Group products in order to produce the outer casing of JuiceBoxes, resulting in savings of almost 24 tons of polycarbonate and over 150 tons of CO_2 in 2021.

Circular Economy Score Client Report (CE Report)

In 2021, approximately 170 CE Reports were completed, supplying customer companies with solutions which, if adopted, can generate potential yearly savings of more than 17,000 tons of CO_2 and 76 GWh of energy. One example is the collaboration with Genagricola, which after this assessment became the first Italian zero impact farm. This company, with 8,000 hectares cultivated in 22 sites across Italy, used the CE Report to measure the level of circular maturity of its activities and identify tools to start the process of full decarbonization. The use of renewables, better energy management and circular enablers will enable an environmental impact reduction in terms of CO_2 equal to 12,000 thousand tons for the next 20 years, thanks only to energy-related interventions. This collaboration stands as an example of international best practice, and has also been included in the "Net Zero Industrial Clusters" report published by the World Economic Forum.

Monitor for Circular Fashion

Enel X Global Retail has also launched, in collaboration with SDA Bocconi Sustainability, the **Monitor for Circular Fashion** project, with the aim of providing an accurate and dynamic overview of the state of the circular economy in the Italian fashion sector. The first report dedicated to the sector's macro-trends and the companies' ability to apply circular economy principles across the value chain was completed in 2021, involving 14 ingredient brands, brands & retailers and service providers from the Italian fashion sector. The evidence from the energy analysis showed that the current emissions of the companies involved in the study amounted to 146,448 tCO_2 and could be significantly reduced (-30%) thanks to policies to supply electricity from renewable sources and through investment in self-generation plants.

Circular Economy PA (Public Administration) Report

To spur government bodies towards a more sustainable and circular approach, Enel X has developed an assessment model (**CE Report PA**) to evaluate the level of circular maturity of municipalities and identify a series of solutions to be introduced into a roadmap of concrete interventions with a local impact. This assessment is performed on two levels of analysis: at entire urban/city perimeter level; and for one or more specific sites (buildings and public structures) with a focus on energy circularity.

Circular City Index

In 2021, the **Circular City Index** also became available in Italy – an innovative tool to measure the level of urban circularity of municipalities and identify areas of strength and improvement. The index was developed in collaboration with the Department of Economics and Statistics of the University of Siena and is based exclusively on open data. It is available free of charge to all of Italy's nearly 8 thousand municipalities as of September 2021. Four areas are analyzed to establish the level of urban circularity: digitalization, environment and energy, mobility, and waste. Each of these are given specific scores (based on comparisons with national and European regulations or guidelines) to assess to what extent policies and infrastructures have been adopted to enable the town or city to start a transition towards a circular economy.

Market

Market units play a fundamental role in customer relations by constantly focusing on their needs, and committing to provide quality products and services. Four key lines of action have been established:

- *Customer Relationship*: to create a new circular relationship with our customers by leveraging digitalization and new business models. New digital solutions can reduce material consumption, and new business models (such as sharing Enel spaces with partners and customers) can increase the use factor of the spaces themselves, promoting new types of relationships;
- *Circular Offer*: to design services that make our customers' consumption circular, including offers geared towards renewable energy and services to consume energy more efficiently or extend the assets' service life;
- *Customer Behavior*: to create a new way of interacting with our customers and raise their awareness of environmental issues in order to make their behavior more circular, e.g. through loyalty programs, campaigns and specific engagement initiatives;
- *Partnerships*: to accelerate circularity through partnerships and joint projects with other companies, municipalities, etc.

These levers were then converted into specific projects in the various countries where we operate, such as:

- **GEA (Iberia)**: a participatory platform to exchange views on social and environmental issues, which lets customers participate in sustainability and circularity projects to improve the community and the planet. The pilot project engaged around 10 thousand customers;
- **Digital Register Email (Italy)**: this initiative was developed in collaboration with a technology partner (Infocert) and provides customers with a temporary certified email to ensure secure receipt of formal notifications. Replacing physical mailing with digital delivery also produces a positive impact by saving tons of paper and CO_2.

Occupational health and safety

Priorities

- F Economic and financial value creation
- I Occupational health and safety

Plan

BACKBONES

- **Occupational health and safety**

SDG

Targets

Activities	2021-2023 targets	2021 results	Status	2022-2024 targets	Tag	SDG
Safety Extra Checking on Site (ECoS)[1]	**150** ECoS on health and safety and environment in 2023	**279** ECoS on health and safety and environment carried out		**80** Safety ECoS in 2024	S	3
Safety Contractor Assessment[1]	**300** Contractor Assessments and Support on health and safety and environment in 2023	**1,514** Contractor Assessments and Support on health and safety and environment		**802** Safety Contractor Assessment in 2024	S	3
Reduction of injury frequency rates compared to prior years (LTIFR)		**0.65** (+25% vs 2020)[2]		**0.61** in 2024	S	3
Training hours provided by SHE Factory	⊕	⊕		**+1%** training hours (compared to previous year)	S	3
Strengthening of horizontal initiatives on Business Lines and/or Countries aimed at growing the culture, awareness and commitment of employees and contractors with respect to health and safety issues		• Executed **104** inter Business Line activities (including ECoS, Safety Walk, etc.) • "HSEQ[3] Professional Family Days" held • "Welcome to HSEQ"[3] project dedicated to new resources • Stop Work Policy course provided by SHE Factory on Global perimeter		↻ Target outdated because replaced with specific quantitative targets	S	3

(1) With respect to Environment ECoS and Contractor Assessment, please refer to the dashboard "Environmental sustainability".
(2) This figure is the result of the calculation made using unrounded decimal values and refers to the combined LTIFR, Enel people and contractors. This index is calculated by establishing the ratio between the number of injuries (all injuries, also those with 3 days of absence or less) and hours worked/1,000,000.
(3) HSEQ: Health, Safety, Environment, Quality.

I Industrial · E Environmental · S Social · G Governance · T Technological

Goals: ⊕ New · ↻ Redefined · ↻ Outdated

Status: Off track · On track · Achieved

Activities	2021–2023 targets	2021 results	Status	2022–2024 targets	Tag	SDG
Improvement of the operating assets control system in order to optimize directional strategies, methods of execution, results analysis and the consequent improvement activities		• Further development of the SHE.Start tools for the management of Contractor Assessments, ECoS, Group of Analysis (GOA), Audit and evaluation group • Further development of the SHE.Metrics dashboard with the completion of the following sections: SafetyAnalytics, Fatality Risk Index (FRI), Inspections, Contractor Safety Index (CSI) and Group of Analysis (GOA)		Target outdated because achieved	S	3