REPORT ON THE STATE OF THE GREEN ECONOMY 2024

Focus

The Economy of Tomorrow:
The **Green Deal** at the start of the **10th European Legislature**

STATI GENERALI della Green Economy

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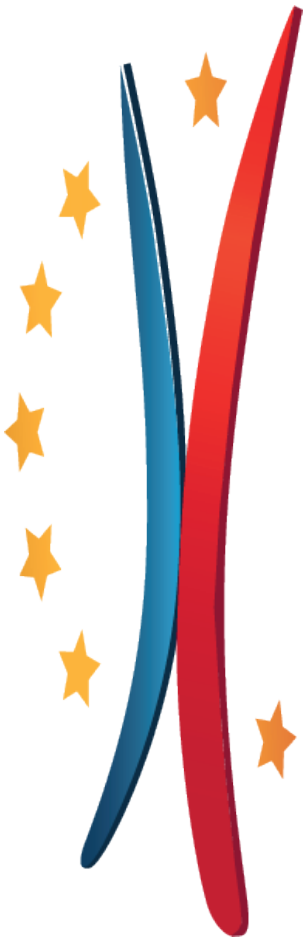

Report on the **state** of the **green economy 2024**

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Focus The Economy of Tomorrow: The Green Deal at the start of the 10th European Legislature

Like any far-reaching change, the Green Deal has challenged established interests and perspectives, sparking widespread debate. To participate effectively in this debate, it is essential, first and foremost, to understand, analyze and evaluate the main provisions of the European Green Deal: a set of measures, directives, and regulations that are generally not well known. It is also important, on various topics, to try to identify the key issues that should be addressed in this new European legislature. With one premise: during the IX legislature, the European Green Deal helped address two major crises – the crisis caused by COVID-19 and the other caused by Russia's invasion of Ukraine – by not only fostering recovery but also setting the European economy on a path toward greater sustainability. The energy and climate transition has, in fact, produced significant results in reducing greenhouse gas emissions and transforming the energy model. Progress is well underway toward greater circularity in the economy and, although with more difficulties, improvements are being made in protecting Europe's natural capital.

"We must and will stay the course on the goals set out in the European Green Deal", stated clearly by Ursula von der Leyen, re-elected President of the European Commission, in her programmatic declarations.

The Transition to Climate Neutrality: The Positive Results of the Green Deal

If the gravity of the climate crisis, its causes and possible solutions were more widely understood, there would be no doubt in recognizing it as a genuine priority. Misinformation also diminishes the significance of the EU's climate commitment, which, by 2023, had reduced greenhouse gas emissions by 31% compared to 1990. After the pause in 2022, impacted by the geopolitical crises and energy price fluctuations, the decarbonization process resumed in the Union in 2023. According to preliminary estimates from Eurostat, emissions in 2023 amounted to 3.43 billion tons of greenhouse gasses (net absorptions): the lowest level since 1990, excluding the pandemic year, with more than a 5% reduction compared to the previous year. With nearly 200 million tons of greenhouse gasses cut in a single year, the European Union as a whole, if it continues at this pace, would be on track to meet the 2030 target of a 55% from 1990 levels. The European Union has significant global responsibilities and is one of the fastest-warming continents in the world. Extreme heat, once relatively rare, is becoming more frequent, while extreme precipitation is intensifying, causing catastrophic floods in various regions. In line with the 2015 Paris Climate Agreement, the European Union adopted its own regulation, **the "European Climate Law"**, which sets the binding target of climate neutrality in the EU by 2050 and an internal net reduction of greenhouse gas emissions of at least 55% by 2030 compared to 1990 levels. In July 2021, the European Commission proposed the **"Fit for 55"** package to achieve a 55% reduction in greenhouse gas emissions by 2030 compared to 1990 levels. One of the key measures of this package, **the reform of the Emissions Trading System (ETS)** which targets large facilities and major greenhouse gas emitters, aims to increase the emissions reduction target to at least 62% by 2030 (compared to 2005 levels). It also plans to gradually phase out free emission allowances for companies in certain sectors until they are fully eliminated. In the new European legislature, there is a further increase in commitment for facilities subject to the ETS, with the global goal of achieving a 90% reduction in net emissions by 2040 compared to 1990. The extension of the ETS to buildings and road transport is expected to be implemented in a fair and gradual manner to mitigate the impacts on the most vulnerable households. To limit the effects of the ETS reform on the competitiveness of European installations, a **Carbon Burden Adjustment Mechanism (CBAM)** is necessary. This is a tax equivalent to the ETS cost, applied to imported products that, in their country of origin, are exempt from such additional costs. The CBAM regulation, adopted on 10 May 2023, foresees several phases of implementation up to 2034. The effective application of the European CBAM system requires significant technical and international management efforts, which will be much more effective if accompanied by implementation agreements with other countries or groups of non-European countries. **The new Effort Sharing Regulation (ESR)**, adopted in April 2023, governs about 60% of European greenhouse gas emissions, covering sectors such as transportation, civil, agriculture, small business, and waste management. It assigns new and more ambitious binding emission reduction targets to individual member states to be achieved by 2030, with the overall goal of reducing European emissions in these sectors by 40% compared to 2005 (with a target of 43.5% for Italy). The accelerated emission reduction effort is challenging, though it is supported by a series of European measures. On 24 April 2024, the EU Directive to promote the improvement of **energy performance in buildings** was adopted, aiming for **zero-emission building stock by 2050**. Decarbonizing existing buildings with the European Union will require large-scale energy renovations: around 75% of the buildings are currently energy inefficient, and 85 to 95% of the buildings in use today will still be in use in 2050. A key goal of the new Directive is to at least double the annual rate of energy retrofitting in buildings. This vast energy efficiency program, especially in heavily indebted countries, will require European financial support and should be viewed not only as a climate measure but also as a significant opportunity for development, job creation, technological innovation, improved living conditions and reduced energy bills for households. Achieving climate goals is closely linked to a significant increase in the production and use of renewable energy, given that the energy sector contributes over 75% of the Union's total greenhouse gas emissions. The **RED III Directive (Renewable Energy Directive)**, adopted on 18 October 2023, raises the European target of final energy consumption using renewable energy sources by 2030 from 32% to 42.5%. Renewable energy sources, especially solar and wind, have become economically viable and are capable not only of replacing fossil fuels, but also significantly lowering energy bills for households and businesses. However, the current functioning of the electricity

market, that has been developed in a context dominated by fossil fuels, does not fully reflect this advantage for consumers, families, and businesses. A reform of the electricity market is needed. To accelerate the development of renewables, greater European momentum and support for rapid investments in grid infrastructure, connections, and storage (both short- and long-term) will be necessary. Would the full decarbonization of electricity in Europe require a significant increase in nuclear power plants? It doesn't seem so. In parallel with the EU's increasing commitment to decarbonization, nuclear-generated electricity in the EU has sharply declined—from 854 TWh in 2010 to 607 TWh in 2022 (IEA, WEO 2023), a drop of 29%. The EU is focusing heavily on renewables for decarbonizing electricity production, with renewable electricity generation rising from 22% in 2010 to 38.8% in 2022, and projected to reach at least 66.8% by 2030 (IEA, WEO 2023). Transport is another key sector for decarbonization, accounting for around 25% of total EU emissions. In December 2020, the European Commission presented a **"Sustainable and Smart Mobility Strategy"** to reduce transport emissions by 90% by 2050, with intermediate targets for 2030 and 2035. The ban on the registration of new internal combustion vehicles (running with gasoline and diesel) starting in 2035 has sparked much debate and is advancing slowly. The relatively high cost of electric vehicles and challenges related to charging infrastructure, both for home charging stations and the limited number of public charging stations, are the main obstacles to the rapid electrification of cars. The focus on larger and more expensive models—with higher profit margins for car manufacturers—is reflected by the fact that there is only one electric model on the European market priced under 20,000 euros. This contrasts sharply with China, where 75 BEV (Battery Electric Vehicle) models are currently available under this price threshold. Despite the slow start and challenges facing the European automotive industry, the shift toward electric vehicles seems inevitable. Resisting or delaying the change would only lead to a loss of competitiveness. It would be better to accelerate efforts to make up for the delays that are accumulating.

The transition to greater circularity of the European economy is well underway

Global resource consumption—minerals, metals, biomass, and fossil fuels—has grown unsustainably over the past 70 years, from 12 billion tons in 1950 to about 106 billion tons in 2023. This high level of material consumption generates about half of global greenhouse gas emissions, contributes to over 90% of biodiversity loss, and is a strategic limiting factor for the development potential of tomorrow's economy. For these reasons, reducing material extraction and consumption through increased circularity in the European economy is a strategic pillar of the Green Deal. The **Circular Economy Action Plan**, presented by the European Commission in March 2020, identifies several intervention areas: improving product design to make products more durable, easier to repair and recycle, and incorporating more recycled materials; facilitating more circular purchasing choices for consumers and public procurement; incentivizing circularity in production processes; and increasing circularity in waste management by improving prevention, recycling quality, and strengthening the market for secondary raw materials. The European Commission has identified sectors where intervention is crucial to boosting circularity rates: electronics, batteries and vehicles, packaging, plastics, textiles, building and construction, food products, and water. Several measures have been approved to enhance circularity: The Regulation on setting ecodesign requirements published in the EU Official Journal on 28 June 2024; the Regulation on laying down ecodesign requirements for smartphones, mobile phones other than smartphones, cordless phones and slate tablets published in June 2023; the Regulation, adopted in July 2023, which concerns batteries and waste batteries, and the Regulation which establishes a framework for ensuring a secure and sustainable supply of critical raw materials. Additionally, the Directive 2024/1799, introducing the so-called "right to repair," mandates that manufacturers must repair products at a reasonable price and within a reasonable timeframe, even after the expiration of the legal warranty period.

Of significant importance during the last legislative term was the new **Regulation on packaging and packaging waste**, which has now reached a final text agreed upon by community institutions which aim to increase the circularity of this strategic sector. Despite the progress made in increasing recycling and the recycling of packaging within the European Union, production continues to rely heavily on large quantities of virgin materials: 40% of the plastic and 50% of the paper used in the EU are dedicated to packaging, which accounts for 36% of municipal solid waste. The new regulation seeks to improve the recyclability of packaging, increase the use of recycled materials, reduce excessive packaging and

increase the reuse of reusable packaging. Thanks to certain amendments introduced, the new regulation could enable the sector to make further progress without compromising the positive results already achieved. We are awaiting the new proposal announced by Ursula von der Leyen for a "new law on the circular economy which will contribute to creating market demand for secondary materials and establishing a single market for waste, particularly concerning critical raw materials". Additionally, several European regulations initiated in the last term should be completed. A new regulation on construction materials to improve their recycling and the reuse of materials derived from recycling. A new regulation on vehicles and end of life vehicles to enhance circularity by improving the reuse, recycling and recovery targets would be very important. A revision of the Waste Framework Directive is also expected, specifically aimed at more effectively combating food waste, increasing circularity in the management of textile waste, and improving regulations related to waste from electrical and electronic equipment. A new Directive in enhancing the circularity of water management, particularly by increasing the reuse of treated wastewater would also be significant.

The protection and restoration of natural capital is proceeding with greater difficulty

The growth of the global population, from 2.5 billion in 1950 to over 8 billion in 2022, along with the increased consumption of land and the extraction of materials, rising from 12 billion tons in 1950 to around 106 billion tons, has significantly depleted natural capital and biodiversity, putting crucial and strategic ecosystem services at risk. The spread of pollution and the impacts of the climate crisis have further aggravated these challenges. In May 2020, the European Commission introduced the **European Biodiversity Strategy**, which is a true pillar of the European Green Deal. This strategy aims to protect at least 30% of the EU's land surface and at least 30% of its seas, as well as to restore degraded ecosystems by 2030. This ambitious goal reflects the growing recognition that safeguarding biodiversity and restoring ecosystems are essential for the health of the planet and for the resilience of both natural and human systems in the face of climate change and environmental degradation.

Given that only 15% of Europe's natural habitats are in good condition, in June 2022 the European Commission presented a proposal for a Regulation on the restoration of nature, the **Nature Restoration Law** which was officially approved in 2024. It builds on key objectives outlined in the Biodiversity Strategy. In the new legislation, following the European Soil Strategy, it would be important to finalize the **Directive on Soil Monitoring proposal**. In addition, following the European Forest Strategy, it would be important to finalize the **Regulation on Forest monitoring proposal**.

The Farm to Fork Strategy, published in May 2020, is one of the key measures under the European Green Deal. It indicates measures and objectives ensuring sustainability across all stages of the food supply chain. Since its introduction, the strategy Farm to Fork has faced criticism, particularly from agricultural sectors in various European countries. These concerns intensified following the Russian invasion of Ukraine, which further strained the already fragile agri-food market. As a result of these criticisms, the full implementation of the Strategy has been delayed. By now, less than half of the 31 initiatives outlined in the Action Plan have been completed. Notably, a legislative proposal on sustainable food systems has not yet been introduced, and the proposed regulations aimed at reducing the use of hazardous chemical pesticides were withdrawn. Given that only 15% of Europe's natural habitats are in good condition, in June 2022 the European Commission presented a proposal for a Regulation on the restoration of nature, the **Nature Restoration Law** which was officially approved in 2024. It builds on key objectives outlined in the Biodiversity Strategy. In the new legislation, following the European Soil Strategy, it would be important to finalize the **Directive on Soil Monitoring proposal**. In addition, following the European Forest Strategy, it would be important to finalize the **Regulation on Forest monitoring proposal**. Given the significant impact of food production on both human health and biodiversity, it would also be prudent to reexamine and resume the goals and principles of the Farm to Fork Strategy.

In this direction, a positive signal for the future of European agriculture emerges from the final document summarizing the outcomes of the "Strategic Dialogue on the Future of EU Agriculture", published in September 2024. This forum defined a shared vision on the future of the EU's agricultural and food system and was initiated in response to the strong protests from farmers. The report, published in September 2024, repeatedly emphasizes the need to ensure a fair income for

farmers and to protect the survival of agricultural businesses, including through a revision of EU trade policies. At the same time, it stresses the urgency of the ecological transition of the European agri-food system, which must become more sustainable, equitable, and resilient, and highlights the significant opportunities that arise from this choice.

The role of businesses in the Green Deal must be strengthened

The European Green Deal was supported in the previous legislature by significant measures **involving European businesses**. On 13 June 2024, the Net-Zero Industry Act was adopted to improve the functioning of the internal market and ensure secure and sustainable access to net-zero technologies, increasing the capacity of European companies to produce at least 40% of the demand for clean technologies and strengthening supply chains. In 2024 the "Directive Against Greenwashing" was approved, aiming to combat misleading business practices based on environmentally incorrect communication to the market and consumers, which in turn promote companies that operate correctly and encourage them to improve their market communications. The involvement of businesses, through the assessment of their performance, has been extended to various aspects of ecological sustainability. The European Regulation, adopted on 31 July 2023, identifies environmental impact themes for sustainability reporting (ESRS). Subsequently, on 13 June 2024, the Corporate Sustainability Due Diligence Directive (CSDDD) was approved, which applies to companies with more than 1,000 employees and a turnover exceeding 450 million euros. The involvement of businesses, through the evaluation of their performance, has been extended to various aspects of ecological sustainability. The European Regulation, adopted on July 31, 2023, identifies environmental impact themes for sustainability reporting (ESRS). Subsequently, on June 13, 2024, the Corporate Sustainability Due Diligence Directive (CSDDD) was approved, which applies to companies with more than 1,000 employees and a turnover exceeding 450 million euros. The application of the Corporate Sustainability Reporting Directive (CSRD) is being expanded, albeit gradually. Companies subject to this directive are required to report information according to **European sustainability reporting standards (ESRS)**. The transition towards a more circular economy also necessitates that companies become more aware of their circularity performance at each stage of the production process and throughout the entire value chain. To this end, adequate tools for measuring circularity rates are very useful. In this regard, **the UNI/TS 11820** standard titled "Measurement of Circularity - Methods and Indicators for Measuring Circular Processes in Organizations" was published on 30 November 2022. In the new legislative term, to further engage European companies in the Green Deal, Von der Leyen proposed a **"Clean Industrial Deal"**, supported by European legislation for "the industrial decarbonization accelerator to assist industries and companies during the transition." Agricultural policies, as noted at the end of the last legislative term, faced several setbacks. In the X legislature, more must be done to engage various stakeholders in the agricultural sector.

More European Resources are needed to invest in the Green Deal

It would be wise for the new European legislature to establish a commitment not to backtrack on the amount of funding mobilized in the previous legislature for the Green Deal. For post-pandemic recovery, **NextGenerationEU** allocated **723 billion in 2021** - €338 billion in grants and €385 billion in loans. Following the Russian invasion of Ukraine, the **REPowerEU Plan** was launched in May 2022 to rapidly reduce Europe's dependence on imported fossil fuels, particularly gas, mobilizing approximately **300 billion**. Significant "ordinary" European funding also contributed to the Green Deal during the IX European legislature. The InvestEU Fund 2021-2027, established in 2021, mobilized **372 billion** in public and private investments. Notably, the 2023 Regulation established a European framework for **green bonds**, with the Commission aiming to raise **250 billion** in green bonds to finance up to 30% of NextGenerationEU. In the X legislature, a critical issue arises, as highlighted in Von der Leyen's programmatic communication: mobilizing resources to finance the ecological transition, even beyond emergencies like COVID or the Russian invasion of Ukraine. In the ecological transition, the EU has not set less ambitious goals than the USA and China, nor implemented less impactful regulatory measures and tools; However, it risks deploying a lower amount of financial resources, both public and private. In this regard, Ursula Von der Leyen referred to the **Draghi Report** on the future of European competitiveness and the **Letta Report** on savings and investments. According to estimates from the Draghi Report on competitiveness, to achieve the ecological and digital transition and ensure security, Europe will need investments estimated at €750-800 billion per year. To meet this target, the report emphasizes, investments from individual

national states and the currently limited resources of the European Union budget will not be sufficient. There will be a need for both the mobilization of greater private investments and the implementation of new European common debt instruments. The Letta Report also addresses the transition to a green economy, not only as an environmental necessity but as a key factor in enhancing the EU's global competitive advantage. To seize this opportunity, it will be essential to focus on financing the transition, directing both public and private resources towards transforming the European production system. The report emphasizes the importance of additional investments for the transition (estimated at over €600 billion annually from now until 2030). Despite being one of the world's leading economic powers, the EU's presence in global financial markets does not proportionally reflect its GDP. However, with €33 trillion in private savings, most of which are held in bank deposits and currencies, the EU possesses enormous untapped investment potential. Developing an integrated and robust European financial market is essential to channel these savings into productive investments that support the transition.

Strategic Themes on the Green Economy in Italy

The climate crisis is worsening

EMISSIONS AND THE CLIMATE CRISIS

According to estimates from ISPRA, 2023 was the second hottest year ever recorded in Italy, and the forecast for 2024 is even more alarming. Cities have been particularly affected. A study conducted by Meteo.it and *Corriere della Sera,* based on forty years of data from 108 provincial capitals in Italy, revealed that average temperatures have risen by 2 to 3 degrees Celsius, and the number of tropical nights, when temperatures never drop below 20°C, has increased significantly. Based on data from the European Severe Weather Database, Italy for Climate reconstructed the number of extreme weather events that have impacted Italy since 2018. In 2023, a record was set with over 3,400 events such as heavy rains, hailstorms, tornadoes, and strong winds—more than three times the number recorded in 2018. In 2023, Italy's snow water reserves amounted to 4 billion cubic meters, the lowest level recorded at least since 2011. Compared to the average of the past decade, this represents a 60% deficit, with some basins, like those of the Po and Adige rivers, experiencing nearly 70% less water availability.

Greenhouse gas emissions are decreasing

In 2023, Italy's greenhouse gas emissions dropped by more than 6%, a reduction of over 26 million tons. This represents one of the most significant decreases in emissions recorded in Italy since 1990, during a year of modest economic growth, 0.9% GDP increase. This contrasts with previous years of sharp emissions declines—2009, 2013, and 2020—which were all marked by significant economic crises. For the first time, Italy's emissions fell below the threshold of 390 million tons of greenhouse gases. More importantly, this reduction positions the country to potentially meet the ambitious target of -55% in emissions by 2030 compared to 1990 levels. Aside from the transport sector, which showed little reduction in emissions, the industry and buildings sectors both saw reductions of 4% to 6%. The most notable improvement came from electricity generation, which cut emissions by almost 20%. This was due to a decline in coal consumption and a significant rise in renewable energy, which surpassed 45% of national electricity production. Between 1990 and 2023, Italy managed to reduce its emissions by approximately 25%, net of absorption, which is lower than the European average of 29% and much lower than Germany (-41%). However, Italy's performance is significantly better than France and Poland (both at -21%) and Spain (which reported the same emission levels in 2023 as in 1990).

Photovoltaic is growing, but all renewables must grow much more

RENEWABLES

In 2023, for the first time in recent history, renewable energy sources accounted for more than 44% of Italy's total electricity production. This was partly due to the recovery of hydroelectric power after its collapse in 2022 and the resurgence of photovoltaic installations, with wind energy contributing to a lesser extent. The new capacity of solar and wind power rose to about 3 GW in 2022 and almost 6 GW in 2023. This trend continued into 2024, with renewable sources covering 43.8% of energy demand in the first six months,

compared to 34.9% in the same period of 2023—a historic record for the first half of the year. In the first half of 2024, the operational renewable capacity increased by 3,691 MW (of which 3,341 MW was photovoltaic) a figure 1,074 MW (+41%) higher than the same period of the previous year. Despite this positive trend, the progress is still insufficient. To meet the EU's 2030 targets, Italy would need to nearly double the 2023 figures to an annual average of 11–12 GW. On a European level, other countries are performing better: in 2023, Germany installed nearly 18 GW of renewable energy capacity.

Renewable energy sources for thermal consumption have been stagnant for several years. Two-thirds of thermal consumption satisfied by renewables comes from biomass (wood or pellet stoves and district heating plants); solar thermal and geothermal energy remain quite marginal, each representing about 2% of thermal renewables. The consumption of heat pumps has increased slightly, reaching 2.7Mtep in 2022, but the trend is decidedly insufficient. The share of thermal consumption covered by renewable sources in Italy in 2022 was only 21%, lower than the European average of 25%, with growth of just 4% over the last 10 years, while the average growth in the EU27 was a significant 23%. Renewables in the transport sector account for only 10% of the sector's energy consumption. Biodiesel still represents the main type of source in this sector, although biogas has also grown in recent years; however, with only 200 million cubic meters in 2022, its contribution remains limited. Electric renewables perform slightly better, but consumption levels in transport are still very low, highlighting the challenges in electrifying this sector.

Fossil energy consumption is decreasing

ENERGY SAVINGS

In 2023, primary energy consumption in Italy decreased by nearly 4 Mtep: natural gas consumption fell by 5.6 Mtep, coal by 2.2 Mtep, and petroleum products by 1 Mtep. These reductions were only partially offset by an increase in electricity imports (+1.8 Mtep) and, most notably, by an increase in renewable sources (+3.3 Mtep). Buildings remain the most energy-intensive sector, accounting for over 40% of national energy demand in 2023, although their consumption decreased by 5.5%, equivalent to -2.5 Mtep.

The transport sector is confirmed to be the second largest energy consumer in Italy, representing 35% of the total, and is the only sector where energy consumption increased last year: by 2.2%, equivalent to +0.7 Mtep. Finally, the industrial sector, responsible for 21% of national final consumption in 2023, registered a significant reduction of 6%, equivalent to 1.2 Mtep. In the European context, in 2022, final energy consumption per capita in Italy was 1.88 tep per year, compared to an EU27 average of 2 tep, and 1.95 and 2.30 for France and Germany, respectively. Between 2005 and 2022, energy consumption per unit of GDP in the Italian economy decreased by 23%, less than the European average, which recorded a decrease of 32%.

The circularity indicators of the economy remain good

CIRCULAR ECONOMY

Resource Productivity: In 2023, Italy generated €3.6 of GDP for every kilogram of resource consumed, which is 62% higher than the EU average. Spain and France followed in second place, with €3.1 of GDP per kilogram of resource consumed. Germany ranked next at €3/kg, while Poland lagged significantly behind other major European countries at €0.9/kg.

Waste Recycling Rate (urban and special waste excluding mineral waste): Italy's recycling rate for waste in 2020 was 72%, the highest in the EU, where the average was 58%. Compared to other major European economies, Italy consolidated its lead, surpassing Germany by approximately 17 percentage points, which was the second highest.

Circular Material Use Rate: In the EU in 2022, the last available year, the circular material use rate was 11.5%. In Italy, this figure reached 18.7% (confirming the downward trend observed in recent years). This rate is second only to France's (19.3%) and is nearly 6 percentage points higher than Germany's. Poland followed with 8.4%, and Spain was last at 7.1%.

The increase in land consumption does not stop

NATURAL CAPITAL

Between 2021 and 2022, net land consumption in Italy amounted to 70.8 square kilometers, which is equivalent to 19.4 hectares per day, the highest value since 2012. In 2022, this new land consumption occurred despite a population decrease of approximately 206,000 inhabitants. Consequently, per capita land consumption increased by an additional 2.46 m^2 per person, reaching an overall level of 364 m^2 per inhabitant. In 2022, the main land artificialization interventions took place in the Po Valley—particularly along the Emilia route and the Milan-Venice corridor—as well as along the Adriatic coastal strip, with significant episodes noted in the Romagna coastline and Salento. The highest percentages of land consumption continue to be recorded in Lombardy (12.16%) and Veneto (11.88%).

The availability of water is reduced, but network losses remain high

WATER RESOURCES

The average annual availability of water resources in Italy is progressively decreasing due to both the decline in precipitation and the simultaneous increase in evapotranspiration caused by the ongoing climate crisis. In the thirty-year period from 1921 to 1950, our country had a water availability of 166 billion cubic meters per year; the average for the period from 1991 to 2020 was only 134 billion cubic meters per year, representing a loss of about 20% of renewable water resources. The estimate for 2023 is even lower, at 112.4 billion cubic meters, which corresponds to an 18% reduction compared to the average for the entire period from 1951 to 2023. The relationship between resource availability and the amount extracted shows clear critical elements. In the ten years between 2012 and 2022, while the volume of water delivered decreased by 10% (from 238 to 214 liters per person per day), losses have continuously increased and now stand at 42.2% at the national level. The worst performances are recorded in the islands and southern regions, with averages of 51.9% and 50.5%, respectively.

Greenery in urban areas is not increasing

GREEN AREAS

The percentage of vegetated area relative to the urbanized surface in the main Italian cities remained virtually unchanged from 2016 to 2022: Turin 28,3%, Aosta 50,35%, Genoa 49,29%, Milan 33,77%, Venice 38,34%, Bologna 48,8%, Florence 50,57%, Rome 55,04%, Perugia 68,89%, Naples 32,26%, Cagliari 33,81%, Bari 46,13%. The census of municipal green areas shows that the **Green Plan** has been approved in only 8% of provincial capitals, a concerning delay. In 2021, the incidence of directly accessible green space for citizens in these capitals was only an average of 8.55 square meters for every 100 square meters of urbanized area.

Even if affected by the climate crisis, organic and quality production is growing in agriculture

AGRIBUSINESS

In Italy in 2023, the agriculture, forestry, and fishing sector recorded a decline of 2.5%, continuing a negative trend that has persisted for four years. Wine production experienced a volume reduction of 17.4%, returning to levels seen in 2017, primarily due to high temperatures and a lack of precipitation during the autumn. A significant decrease (-11.2%) also affected the production of all major fruit crops due to adverse climatic events. Olive oil production also decreased (-3.0% in volume). Ultimately, even in 2023, the effects of climate change have a negative and significant impact on the production and overall economic performance of our agriculture. Despite the adverse climatic conditions, the area cultivated using organic methods continues to increase. As of 31 December 2023, the total area certified and in conversion amounts to 2,456,019 hectares, representing a 4.5% increase compared to the previous year and an 86.5% increase over the last ten years. Organic crops account for 19.8% of the total Utilized Agricultural Area (SAU). We are rapidly approaching the target of 25% by 2030, set by the *Farm to Fork* strategy, with a good chance of reaching this goal by 2027. Italy also remains a leader in Europe in terms of the number of certified quality agricultural products (DOP, IGP, STG): in 2023, there are 838 such products (326 in the food sector and 527 in the wine sector), accounting for 27.1% of the total in Europe. In 2022, the DOP and IGP food sector was valued at 8.85 billion euros in production value (an increase of

8.8% over the last year and 33% since 2012) and 17.3 billion euros in consumer value.

The number of new cars in circulation is increasing again, while the share of electric cars remains low

As of 31 December 2023, the number of registered cars on Italian roads approaches 41 million. The increase in the number of cars compared to 2022 was over 702,000 units, nearly double the increase recorded in the previous year, leading to a further rise in the motorization rate, which now stands at 694 cars per 1,000 inhabitants—the highest among major European countries.

In 2023, 84% of the registered vehicles in Italy are gasoline and diesel cars, a decrease of 1.8% compared to 2022. After a negative performance in 2022, new car registrations in 2023 resumed growth, reaching approximately 1,566,000 vehicles, an increase of 19% over 2022, with nearly 250,000 more cars. The share of newly registered cars with "alternative" fuels—different from traditional gasoline and diesel engines—rose only from 53% in 2022 to 54% in 2023, reflecting a slowdown compared to previous increases. However, there were positive signs for nearly all alternative fuel types: hybrid (+26%), LPG (+20%), and electric (+16%), except for methane-powered car registrations (-82%). Despite the absolute increase in newly registered cars, the market share of electric vehicles (both full electric and plug-in) slightly decreased, from 8.8% to 8.6%. In 2023, gasoline and diesel cars experienced growth again, increasing by 22.5% and 6%, respectively, breaking a continuous decline since 2019 for gasoline cars and since 2017 for diesel cars. Approximately 66,000 fully electric vehicles (BEVs) were registered in Italy in 2023, accounting for 4.2% of total registrations, with a modest growth of 0.5% compared to 2022. The market share of plug-in electric vehicles decreased from 5.1% in 2022 to 4.4% in 2023, with just over 69,000 cars. Among the major European economies, Italy lags in electric vehicle penetration, with only 9% of total new registrations being electric. In Germany, electric cars represent 25% of new registrations; in France, the share is 26%; in the United Kingdom, it is 24%; and the EU average stands at 22%. In Norway, electric vehicles account for 90% of sales, followed by Sweden with 60% and the Netherlands with 45%.

The international framework

The growth of global greenhouse gas emissions is slowing down

The takeaway from the transition to climate neutrality in China, the United States and India

In the last three years, 2021-2023, there has been an average annual increase in global CO2 emissions of 333 million tons, compared to an average annual increase of about 523 million tons in the previous 20 years. These emissions data indicate not only that it is possible to dissociate global economic growth rates (+12% of cumulative global GDP over the three years) from greenhouse gas emissions (+2.7% of emissions over the three years), but also that the increase in CO2 emissions is significantly slowing down. This is a first positive signal, although insufficient: to reduce greenhouse gas concentrations in the atmosphere—concentrations that drive global warming—emissions need to decrease consistently and over a prolonged period. In the absence of such a reduction, CO2 concentrations in the atmosphere continue to rise: in 2024, the annual average of CO2 levels in the atmosphere will be even higher than in 2023, around 423.6 ppm. The increase in greenhouse gas concentrations in the atmosphere is causing the ongoing rise in average global temperatures. Copernicus, the European study center, has estimated that in 2023, the temperature will rise by 1.48 °C compared to the pre-industrial period of 1850-1900. With the current trend, there is an 80% probability that the annual average global temperature could exceed a 1.5°C increase within the next five years. The international climate negotiations are progressing too slowly. The final document of COP28 in 2023 urges all nations to transition away from fossil fuels to avoid the worst effects of climate change. The document specifically proposes to triple global renewable energy capacity by 2030. As highlighted by IRENA in its July 2024 report, renewable energy is rapidly growing worldwide, with a record increase in new global renewable

capacity in 2023 of 14% compared to 2022. We are therefore on the right track, although to achieve the goal of tripling renewables globally by 2030, the annual growth rate would need to rise further, to at least 16.4%. Johan Rockström from the Potsdam Institute stated, *"The agreement will not allow the world to maintain the 1.5 °C limit, but it is a fundamental benchmark. This agreement aims to clarify to all financial institutions, businesses, and society that we are finally, eight years behind the Paris Agreement schedule, at the true beginning of the end of the fossil fuel-based global economy."*

To stop the worsening of the climate crisis and begin reversing the trend of global warming, the next few years of commitment from the world's major emitters will be crucial: China, the United States, the European Union, and India, which together generate about 60% of global CO2 emissions (IEA-WEO 2024). We have already extensively discussed the climate policies of the European Union in the dedicated section; now, let's take an updated look at the climate policies of the other three major greenhouse gas emitters.

China, the world's leading CO2 emitter has increased its CO2 emissions from 8.7 Gt in 2010 to 12.1 Gt in 2022, representing a growth of 39%. Its share of global emissions, the highest among all countries, also rose from 26.5% in 2010 to 32.7% in 2022, with per capita emissions exceeding 8 tons annually, compared to a global average of 4.7 tons. However, these figures might lead to underestimating the extent of the ongoing energy transition in China, driven by various factors: the significant impacts of the climate crisis on China's vast territory, the growth of Chinese technological and production capabilities, the decision to focus on global leadership in decarbonization technologies, and the industrial and export successes achieved through this choice. In 2022, China sold 60% of the world's electric vehicles, 50% of wind power installations, and 45% of solar photovoltaic systems. An editorial from the Financial Times in early summer reported that in May 2024, electricity generated from renewable sources in China reached a record percentage of 39%, reducing the coal share to a historic low of 53% (down from 60% in 2023). The share generated by nuclear power is 5%, while that from gas is 3%. Electricity production from renewable sources in the first five months of 2024 increased by a record 78 TWh. If this growth rate in renewables is maintained, there will be a significant development: greenhouse gas emissions from electricity production in China could begin to decline as early as the end of 2024. For the transition to climate neutrality in China, rapidly phasing out coal usage remains crucial. In 2022, China consumed more coal than all other countries combined. The combustion of coal emitted 8.6 Gt of CO2, accounting for about 70% of its total emissions and one-quarter of global energy-related emissions. Beyond percentages, absolute values must also be considered, as the increasing demand for electricity in China has been met with new coal plants, adding nearly 40 GW of new capacity on average each year over the past five years, more than the rest of the world combined. Even in 2022, nearly 90 GW of new coal power capacity was approved, and the construction of another 50 GW was greenlit, in addition to almost 100 GW of coal plants under construction at the end of 2022. If these new plant numbers are maintained, China would continue to increase its coal usage, at least until 2030! Unless the growth of renewables accelerates significantly, as is currently happening, leading to an earlier peak in coal usage, reducing the construction of new plants and/or cutting back on the use of electricity generated from coal.

The United States, the second-largest greenhouse gas emitter globally, after China, but the top emitter in terms of per capita emissions among major countries, emitted 5.5 Gt of CO2 in 2010, which was reduced to 4.7 Gt in 2022, with a decline of only 14.5%. The worsening impacts of the climate crisis in the United States, technological advancements, and the political direction under the Biden administration have spurred unprecedented levels of government support to drive a stronger and faster reduction in greenhouse gas emissions.

The key legislative drivers of this American shift have been the Bipartisan Infrastructure Investment and Jobs Act of 2021, which invested around $190 billion in clean energy and public transportation, and the Inflation Reduction Act (IRA) of 2022, which mobilized about $370 billion in funding to promote energy security and fight climate change.

These and other initiatives are expected to reduce CO2 emissions by approximately 40% by 2030 compared to 2005 levels.

The updated U.S. Nationally Determined Contribution (NDC) aims to reduce greenhouse gas emissions by 50-52% by 2030, compared to 2005 levels. The Inflation Reduction Act and the Bipartisan Infrastructure Investment and Jobs Act have reshaped the U.S. energy outlook. In many sectors, these policies are driving increased investment in renewable energy, accelerating the deployment of clean energy technologies, and fostering the development of new manufacturing capacities within the U.S.

Electric vehicle sales in 2030 are expected to be 13 times higher than 2021 levels, while carbon capture projects completed by 2030 are projected to handle three times the volume of CO2 emissions forecasted in 2021. Low-emission hydrogen is also expected to grow significantly beyond the modest levels predicted in 2021. The Biden administration has set a goal of achieving 100% clean electricity by 2035 to maintain leadership in the energy transition. Federal agencies are required to procure 100% carbon pollution-free electricity by 2030. In 2019, Berkeley, California, became the first U.S. city to ban natural gas use in new buildings to combat climate change. Since then, dozens of cities, including major ones like San Jose and New York City, have followed suit. On a state level, New York plans to ban fossil fuels in all new buildings by 2027. The latest building code update in California mandates that new buildings be wired for fully electric operations, and Washington State requires new buildings to be equipped with heat pumps. In 2021, the U.S. set a goal for 50% of new passenger vehicles sold to be zero-emission by 2030, and federal agencies are required to purchase 100% zero-emission light vehicles by 2027. On a state level, California finalized rules mandating all passenger vehicles sold after 2035 to be zero-emission, similar to the EU's regulations. In September 2022, the U.S. Department of Transportation approved plans for all 50 states, Washington DC, and Puerto Rico to build a national electric vehical charging network, backed by $5 billion in funding from the Bipartisan Infrastructure Law. Electric Vehicle sales are also receiving a significant boost from tax credits included in the Inflation Reduction Act (IRA), offering up to $7,500 for qualifying electric vehicals assembled in North America, and removing the manufacturer cap that had previously disqualified GM and Tesla EVs from eligibility until 2023.

India, in 2010 emitted 1.7 Gt of CO2, a figure that rose to 2.6 Gt in 2022, reflecting a 53% increase during this period (WEO IEA 2023). While India's total emissions are comparable to those of the European Union, its population is three times larger, resulting in much lower per capita emissions, less than half the global average and about a quarter of China's. India's greenhouse gas emissions are growing rapidly. As the world's most populous country, India is also one of the nations most severely impacted by the climate crisis, facing increasingly frequent and severe extreme weather events. In recent years, summer heatwaves in India have arrived earlier and lasted longer. New Delhi ranks as one of the hottest capitals, with temperatures during one of the worst heatwaves in the city's history reaching up to 50°C in some areas. Many cities across India are experiencing a severe water crisis, forcing many people to rely on water tanks for essential needs. India's monsoons have become more erratic over the past decade, with record rainfall occurring within 24-hour periods, leading to increased flooding. In June 2024, over half a million people in northeastern India were affected by severe floods. India's monsoons have become more erratic over the past decade, with record rainfall occurring within 24-hour periods, leading to increased flooding. In June 2024, over half a million people in northeastern India were affected by severe floods. At the COP26 summit in Glasgow, India announced its intention to achieve net-zero emissions by 2070. To meet this target, the country has implemented policies to boost renewable energy production and develop low-carbon technologies, aiming to double its investment in clean energy by 2030, compared to the approximately $60 billion invested in 2022. India is projected to have the fastest-growing energy demand of any country or region in the world over the next three decades. With rapid industrial expansion, its CO2 emissions are expected to increase by about 30% by 2050, which could be the largest global increase in emissions. This current trajectory could shift towards a lower emissions growth path, compatible with a global net-zero scenario, if India increases its commitment to renewable electricity

production. Specifically, India would need to aim for at least 50% renewable energy by 2030, compared to the 41% share in 2022, especially with a more significant expansion of solar energy; accelerating the growth of electric mobility and improving energy efficiency in both residential and industrial sectors. India's CO2 emissions could decrease by over 40% from current levels by 2050, even if its GDP were to quadruple during this period, putting it on a trajectory compatible with global climate commitments, well before 2070. To achieve this, renewable capacity additions would need to increase from 10 to 40-50 GW annually. A carbon price around $50/tCO2 by 2030 would be necessary to improve the efficiency of India's energy system, while significant reductions in battery and green hydrogen costs would also be essential. Additionally, we would need higher electrification, particularly in mobility, and greater circularity in the economy. The good news is that increased production and penetration of renewable electricity in India would reduce electricity costs, from 6.15 rupees per kWh to 5.25-5.4 rupees per kWh. This could also generate significant savings by reducing fossil fuel imports, which currently make up 75% of India's energy mix (WEO-IEA, 2023). To finance an accelerated transition toward decarbonization, India would need substantial investments, estimated between $4.9 and $7.2 trillion by 2050: these investments could be achieved through stronger national commitment and international support.

The 2024 Report, which introduces the general states (conditions) of the Green Economy, focuses on the 10th European legislature, placing the Green Deal at the center. It analyzes and evaluates the main provisions, drawing attention to the challenges that need to be addressed.
In the recently concluded legislature, the Green Deal has helped set the European economy of tomorrow on a path toward greater sustainability, achieving significant results. Now is the time to clarify the course towards the established goals and the steps needed to reach them, overcoming all obstacles and the lack of awareness that prevents the climate crisis, its causes, and possible solutions from being considered a real priority.

The Report provides an update on the state of the green economy in Italy, focusing on strategic topics:greenhouse gas emissions and the climate crisis, renewable energy sources, energy saving and efficiency, circular economy, natural capital and water resources, natural capital in cities, the agri-food system, and sustainable mobility.

It concludes by expanding the view to the international level, noting that in the last three years, the growth in global greenhouse gas emissions has slowed down. The coming years will be crucial in halting the worsening of the climate crisis and reversing the course of global warming, with a focus on achieving climate neutrality by the world's major emitters: China, the United States, India, and the European Union.

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