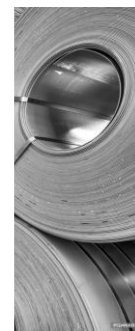


BRIEF

The Italian steel industry across national and European challenges: what prospects for development?



This document has been prepared as part of the activities of the Sectoral Strategies and Impact Directorate, with the coordination of Andrea Montanino and Simona Camerano. The authors are: Alberto Carriero, Michele Masulli, Sofia Torreggiani. The opinions expressed and conclusions are solely attributable to the authors and do not in any way engage the responsibility of CDP. The figures shown refer to the information available as of 26 September 2024. All rights reserved.

- **No industrial development is possible without a strong and competitive steel industry.** It is no coincidence that **Italy**, which is the second largest European manufacturer, is also **second in Europe for steel consumption and production**.
- National **steel production is concentrated in Northern Italy** and **more than 85%** is represented by **secondary steel**, obtained from scrap iron in **electric furnaces**.
- Since this plant equipment, the Italian steel industry enjoys significant **excellence in terms of sustainability**: at EU level, it is **first in terms of volumes of recycled scrap** and, among the main global producers, boasts the **lowest emission intensity**.
- However, it has to deal with **three critical issues at the national level**:
 - i. **crisis of the integral cycle**, closely linked to the decline in the activities of Acciaierie d'Italia of Taranto, the main national producer of flat rolled products, only partially compensated, in terms of volumes and product specificity, by other electric furnace plants;
 - ii. consequent **decrease in the national production of flat steel products** which are essential for the manufacture of key components in sectors such as mechanics, transports and domestic appliances;
 - iii. **shortage of ferrous scrap**, the demand for which will grow a lot in the coming years in Europe, and structurally higher energy costs than peers;
- In addition to the national phenomena, **three main challenges emerge** shared by the Italian sector and other EU countries:
 - i. **global production overcapacity**, led mainly by large Asian steel industries, is one of the causes of the underutilization of European plants and the decline in the profitability of EU industry;
 - ii. **US trade policies** have weakened the international projection of European industry since 2018;
 - iii. **potential increase in costs** for the supply chain stemming from the implementation of some EU climate policies (i.e., CBAM and ETS reform).
- The interventions in support of the sector will have to be divided along **three lines**:
 - i. definition of **industrial policies and coordinated trade measures** between the EU and the United States;
 - ii. **strengthening and expansion of the production equipment**, preventing competitive crowding out effect of the active plants and the destabilization of the already tense scrap market;
 - iii. **accompanying companies** in the processes of **decarbonization and digital transformation**.

THE 10 FIELDS OF ACTION OF CDP 2022-2024 STRATEGIC PLAN



1 ENERGY TRANSITION



2 CIRCULAR ECONOMY



3 SAFEGUARDING LOCAL AREAS



4 SOCIAL INFRASTRUCTURE



5 CAPITAL MARKET



6 DIGITISATION



7 TECHNOLOGICAL INNOVATION



8 SUPPORT TO STRATEGIC SUPPLY CHAINS



9 INTERNATIONAL COOPERATION

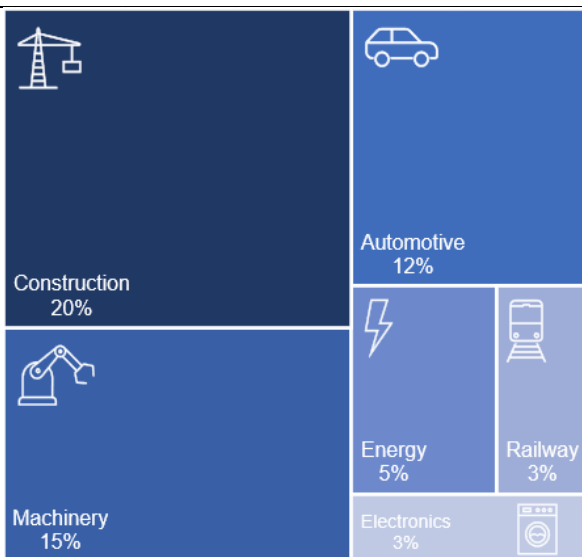


10 TRANSPORT/ LOGISTICS HUBS

added value on the total manufacturing industry (over 2%), double that of Germany⁴.

- ▶ In addition, Italy boasts a **higher export specialization index in the metallurgical sector** – which includes the steel industry – than France, Germany and Spain⁵, showing the competitive capacity of Italian steel and steel products on foreign markets.
- ▶ Italy is also **second only to Germany in terms of steel consumption** in Europe, given its marked production specialization in mechanics⁶.
- ▶ This is in fact one of the **fundamental inputs of the national production system**, crucial for the competitiveness of some **strategic supply chains** such as construction, industrial machinery, automotive, energy and electronics, which together account for 60% of national steel demand⁷ (graph 2).

Figure 2 – Top6 steel user dies



Source: CDP calculations based on Istat 2023 data

- ▶ Thanks to the strong prevalence of electric furnace production, the Italian steel industry

⁴ Source: Eurostat, Structural Business Statistics latest available years (based on the variable used 2021 or 2022), ateco code 241.

⁵ Source: Istat (Report on the Competitiveness of Productive Sectors, 2024).

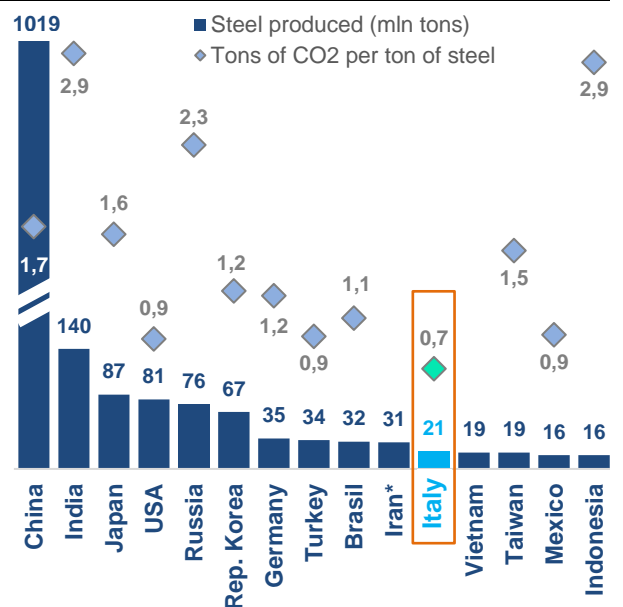
⁶ See footnote 1.

⁷ Source: Istat (Permanent Business Census, 2023).

boasts important **records** in terms of **sustainability**⁸:

- it is among the most virtuous in terms of **circular economy**: at EU level, it is the **first in terms of the amount of recycled and reused ferrous scrap**⁹;
- among the world's leading producers, it is the one with the **lowest emission intensity**: only 0.7 tons of CO2 emitted per ton of steel produced compared to the world average of 1.5 (graph 3).

Figure 3 – Steel production and emission intensity of the world's top 15 producers



Source: CDP calculations based on World Steel Association and IEA data, 2023 Notes: *Emissions data not available for Iran and Vietnam.

- ▶ Despite its undoubted strengths, the Italian steel industry is dealing with **several critical issues**. Some are **specific to the Italian market**, while others **insist on the competitiveness of the sector at the European level**.

⁸ Compared to integral cycle systems, electric furnaces allow significant energy savings and have a lower environmental impact.

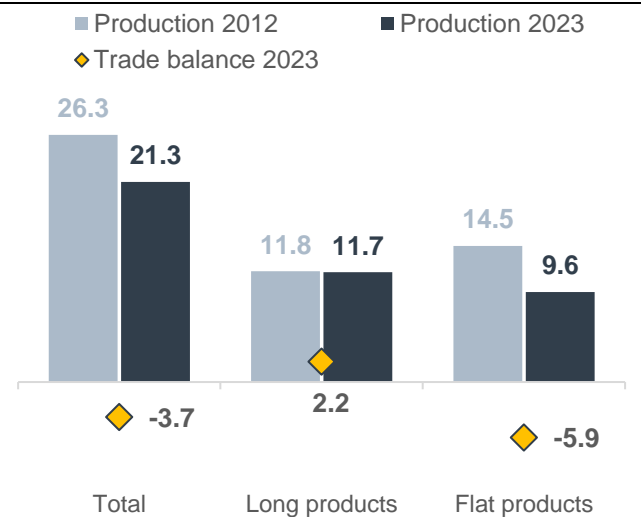
⁹ Data source: Federacciai (Sustainability Report, 2023), Fondazione per lo Sviluppo Sostenibile (Il Riciclo in Italia, 2023).

2. The main national critical issues

- ▶ Here are **three among the structural weaknesses** of the Italian steel industry: (1) the **crisis of the integral cycle**; (2) the consequent **decline in production volumes of flat steels**; (3) the difficulties in finding raw materials and the **energy costs**.
- ▶ Starting from 2022, the crisis of the **integral cycle plant of Acciaierie d'Italia**, the only Italian producer of primary steel and, traditionally, the largest national supplier of flat products, has further worsened. In 2023, the Taranto plant produced **just under 3 million tons**, declining further in 2024, compared to a historical production of over 8 million tonnes and accounting for **one third of the national total**.
- ▶ The difficult conditions of this plant are at the root of the **drop in production volumes of flat rolled products** in Italy, only partially offset by other electric furnace plants. **Between 2012 and 2023**, the national production of long rolled products is almost stable (almost 12 million tons), while **flat products decreased by one-third**, the shortage of which is at the origin of the trade deficit in the sector.
- ▶ For this reason, in 2023, against a domestic consumption of 15 million tons, the country imported over 11 million tons of flat products. On the other hand, in the same year, Italy bought 2 million tons of long products from abroad out of a total of over 9. Therefore, the national industry **depends on foreign countries** (mainly from **non-EU ones**) for **three quarters of the need for flat products**, currently **used more than long products in the production system**¹⁰ (graph 4).

¹⁰ Data source. Federacciai, 2024.

Graf. 4 Production and trade balance by type of product (million tonnes)



Source: CDP calculations based on Federacciai data, 2024.

- ▶ **Long steel products** are largely used for **construction**. **Flat products** are essential for the manufacture of key components in sectors such as **mechanics, transports and domestic appliances**. If for construction, after the boom recorded with the adoption of the 110% Superbonus, a moderate demand trend is expected in the short term, a livelier market dynamic is expected for many sectors using flat products.
- ▶ The shortage of flat products raises issues related to the **technological availability and plant equipment** of the Italian steel industry. It is possible to increase the production levels of the flat products by using the electric furnace; however, technical specificities do not make them suitable for all uses.
- ▶ **Flat rolled products realized from primary steel cannot be replaced in various processes**¹¹; the **production of primary steel**

¹¹ These include car bodies and other parts of the car body, tin packaging for food storage, complex profiles for furniture and components of mechanical systems that require deep deformation.

is, therefore, an **essential issue for the volumes but above all for the quality of the output** of the Italian steel industry.

- ▶ In addition, critical issues related to the **availability of scrap** to feed the electric furnaces will arise in the short to medium term. In the coming years, **the demand for scrap** is expected to grow significantly **in Europe**, driven by the transformation of many integral cycle plants into electric furnaces¹², with **potential negative effects on the Italian sector, a net importer of scrap** (a third of national needs are met by imports, 15% of which come from non-EU countries)¹³.
- ▶ Among the causes of concern for the main European electro-steel industries is the **positive trade balance of EU scrap**, whose exports, mainly towards Turkey¹⁴, exceed imports by 15 million tons, which has increased in recent years¹⁵.
- ▶ Moreover, despite a limited incidence of energy expenditure on total operating costs compared to European peers, **higher energy costs** weigh on the sector's prospects at national level, also due to the strong dependence of our system on natural gas. In the second half of 2023, the **average price of electricity**, net of taxation, for the most energy-intensive industrial users was **45% higher than for their French counterparts**.
- ▶ **Natural gas** is on average 10% and 20% more expensive than in Germany and France, respectively. In general, despite the fall in the prices of energy inputs, **electricity and natural**

gas continue to cost Italian energy-intensive consumers twice as much as at the end of 2019¹⁶.

- ▶ These system weaknesses are compounded by the short to medium-term **negative effects** of the prolonged slowdown in Germany. It is estimated that, in 2023, **the German recession** has caused both a **reduction of 0.2 percentage points in the Italian GDP growth rate and of 1 point in foreign demand for Italian goods**.
- ▶ **Metallurgy is the most affected manufacturing sector**: the estimated **reduction in added value of 2.4%** (compared to an average of -0.6% for manufacturing) is directly linked to the contraction of the German economy, which annually absorbs about 20% of Italian exports in the sector¹⁷.
- ▶ Overall, in 2023 metallurgy is among the manufacturing sectors that have suffered the most from a **significant reduction in turnover (-39.7%), margins (-45.3%) and exports (-16.7%)**.
- ▶ A stagnant trend in German GDP would therefore continue to damage the sector, with major effects for **medium-sized companies**¹⁸ that would report a 5.3% decrease in value added, and for companies **well integrated within global supply chains (-3.1%)**.

¹² OECD, Latest developments in steelmaking capacity, 2023.

¹³ Data source: Federacciai, referring to 2023.

¹⁴ Between 2017 and 2023, EU ferrous scrap exports to Turkey accounted for an average of 64% of total extra-EU sales (about 11 million tons out of almost 17). Turkey is the world's eighth-largest steel producer and has a steel smelting capacity of around 60 million tonnes per year. It is an important player in the electro-steel sector: 71.5% of

the 34 tons produced in 2023 came from electric furnaces. Data source: Eurostat, 2022 and World Steel Association, 2023.

¹⁵ Data source: Eurostat, 2023.

¹⁶ See footnote 15.

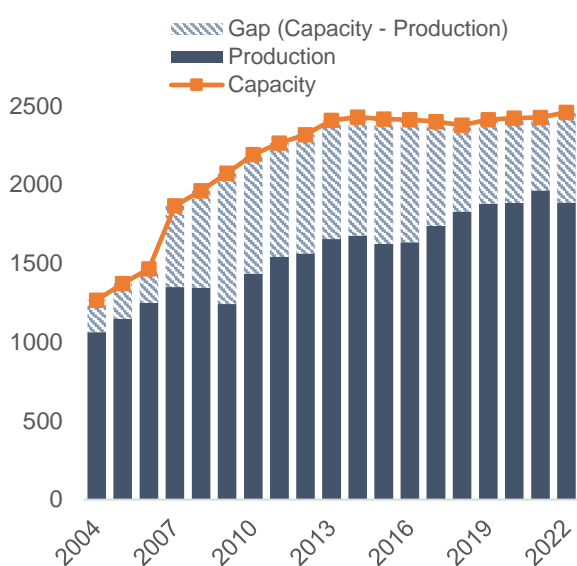
¹⁷ Source: Istat (Report on the Competitiveness of Productive Sectors, 2024).

¹⁸ Between 50 and 249 employees.

3. The main challenges at European level

- ▶ Alongside the national phenomena, there are **critical factors that the Italian sector shares with other EU countries**. These include: (1) **global excess production capacity**; (2) **effects of U.S. trade policies**; (3) potential **increase in costs** for operators stemming from the launch of some EU climate policies (i.e., CBAM and ETS reform).
- ▶ A first critical factor is represented by the **substantial global production overcapacity**, which is of such a size that it affects market trends (graph 5). This overcapacity, led by Asian steel industries, and mainly by China, turns into an **oversupply**, which depresses prices and profitability of industry, **leads to a race for subsidies and creates regional imbalances**.

Graf. 5 – Global steel production overcapacity (million tonnes)



Source: CDP calculations based on World Steel Association and OECD data

- ▶ If left unmanaged, **steel production capacity exceeding product levels** could reach **645 million tons in 2025, namely 34% of global**

demand¹⁹.

- ▶ In particular, the overcapacity of **China**, which accounts for **55% of global steel production** and is the **main European and Italian supplier**, is among the causes of the **underutilization of European plants** and the **loss of profitability** and market share for its producers.
- ▶ The **slowdown of the Chinese economy** in recent months **could exacerbate the effects of overcapacity**. Recent experience shows that, in times of shrinking domestic demand, Chinese penetration of EU imports increases, partly due to higher subsidies²⁰.
- ▶ **Strong capacity growth** in the coming years **is also expected** for the world's second largest producer, **India**, which in 2023 reached its peak activity of the decade with 141 million tonnes of steel produced, surpassing the EU's total production (126 million tonnes).
- ▶ In addition, the crowding out effect due to overcapacity has led to a **significant deterioration in the EU's trade balance**, linked to a marked **contraction in exports**. Extra-EU sales of steel products fell **by 45% between 2014 and 2023**²¹, with long products performing worse (50% drop) than flat products (-40%).
- ▶ Overall, the **EU** has been experiencing a **negative trade balance** since 2018 (when exports exceeded imports by 50% in 2014) and an increasing **dependence on imports**. Despite an improvement in the last year, related to a contraction in imports, a **similar trend can be observed for the Italian trade balance** which, however, was already in negative territory in 2014 (graph 6)²². **Italy depends mainly on China and India**, which

¹⁹ Source: Global Forum on Steel Excess Capacity (GFSEC).

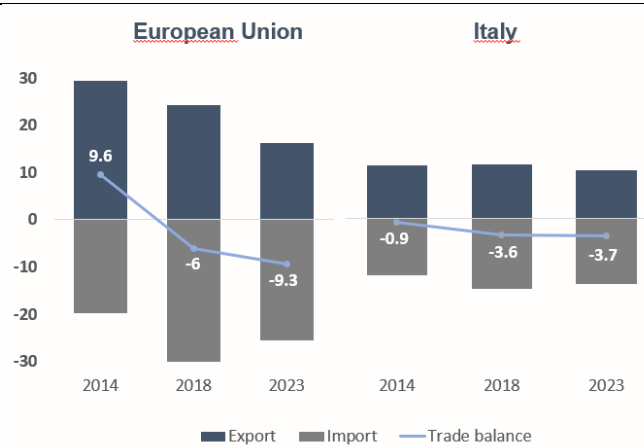
²⁰ *Ibidem*.

²¹ Data source: Eurofer – The European Steel Association.

²² Italy's trade balance would further improve by also considering the products from first and second steel processing, which are not analysed in this Brief and represent, in 2023, 34% of the sector's exports and only 8% of imports. Source: Federacciai.

together account for more than a third of iron and steel imports from non-EU countries²³.

Graf. 6 – EU and Italy trade balance, long and flat products (million tonnes)



Source: CDP calculations based on Eurofer and Federacciai data

- ▶ In addition to production overcapacity, since 2018, the **duties introduced by the US government** have also had an unfavorable impact on the international penetration of European industry, which already in the first year of application resulted in a contraction of a quarter of EU exports to the US (-65% for Italy).
- ▶ Although the US government has later replaced duties with a **less penalizing system of import quotas** (which is added to the protectionist provisions of the "Build America, Buy America Act"), EU exports to the US have not benefited and are still a third lower (-83% for Italy) than before the duties were introduced²⁴. Finally, from October 2023, the transitional phase of the **Carbon Border Adjustment Mechanism (CBAM)**, the EU's

pricing mechanism for imported carbon-intensive goods, including many cast iron, iron and steel products, started.

- ▶ This measure has **several critical factors**, which should be monitored in the experimental phase. Firstly, it generates an **increase in costs for the EU crude steel processing industry** and, above all, for the many downstream user sectors.
- ▶ It might also **penalize European importers of raw materials and semi-finished products** compared to companies importing finished, semi-finished or ready-to-assemble products. By the end of 2025, the Commission should also identify the finished products subject to the application of the CBAM. However, the **complexity of the application of the mechanism** exposes the creation of competitive distortions along the supply chain.
- ▶ The implementation of the CBAM will proceed in parallel with the gradual reduction of the **free permits of the Emission Trading System**, from which the carbon-intensive industrial sectors have benefited so far. The obligation to buy more emission allowances on the market will be an additional cost burden for producers.
- ▶ The EU's high environmental standards compared to US and Asian markets and the resulting economic and administrative burdens expose **European industry to the danger of being cut off from global steel value chains** in favor of production chains that would be articulated abroad by abroad.

²³ Data source: Eurostat.

²⁴ Data source: Eurofer, referring to 2022.

4. What development options?

- ▶ In this framework of lights and shadows, the steel sector benefits from various opportunities, attributable to three main areas: i) **international commercial and industrial policies**; ii) interventions supporting the **production endowment and competitiveness of Italian industry**; iii) interventions related to the **twin ecological and digital transitions**.
- ▶ In the first case, it has been seen how EU and Italian industry have been affected by the trade tensions triggered with the United States. A resolution to the ongoing disputes should come from the **Global Arrangement on Sustainable Steel and Aluminum (GASSA)**. The agreement, which is still under negotiation, would put an end to the protectionist measures introduced by the parties, in order to design a **common approach** to face the evolution of the global steel industry.
- ▶ The objectives of GASSA would be above all two: (1) **to address the issue of overcapacity**, countering its non-market causes, and by defining a common tariff policy²⁵; (2) to encourage the **adoption of higher environmental standards**.
- ▶ In this way, the aim is to support the application of **fair conditions of international trade** in a market marked by unfair practices that distort the principles of free trade. The agreement also represents an opportunity for the EU to support the advancement of global industry, which accounts for 7% of total emissions, towards **European standards of environmental responsibility**.
- ▶ About the solidity and competitiveness of the sector, it is essential to advance quickly in the restart plan of the **Acciaierie d'Italia plant in Taranto**, a strategic stronghold of the national industry in terms of technology, volumes, and type of product.
- ▶ In a similar way, it is necessary to proceed with the evaluation of the plans to relaunch steel hubs in other areas of the country, with the aim of equipping them with state-of-the-art plants.
- ▶ At the same time, it is timely to prevent the effects that such capacity-building interventions could have in terms of: i) **competitive crowding out effect of already active plants** in the production of the same products which are not beneficiaries of public subsidies; ii) **destabilization of the already tense scrap market**, due to the sudden growth in demand and the resulting increase in prices.
- ▶ Concerning scrap, it should be noted that, in the future, the medium-term sustainability of national production will inevitably depend on the **introduction of European control measures on the export** of this increasingly critical material.
- ▶ It would also be appropriate to strengthen the coordination of industrial policy at European level, in order to avoid **distortions within the single market**. The autonomous subsidy actions adopted by France and Germany and, to a lesser extent, by Italy - which has launched its own *energy release*²⁶ for industrial consumers - risk fueling a downward spiral that is a source of competitive asymmetries within the EU.
- ▶ In relation to the twin transitions, Italian industry

²⁵Meanwhile, in May 2024 the US government raised tariffs on several Chinese steel and aluminum products to 25% and announced 6 billion in investments in the production of green products.

²⁶ The *energy release* is an instrument for the supply of renewable energy at a controlled price in favor of the industry managed by

Gestore dei Servizi Energetici S.p.A. Finally, the Decree of the Minister of the Environment and Energy Security of 23 July 2024 no. 268 established the supply procedures to energy-intensive companies in return for the commitment to build new renewable capacity.

must **continue the path of decarbonization**, in order to consolidate its European leadership in terms of sustainability. In fact, the steel industry is highly dependent on fossil fuels and is the largest global consumer of coal and among the main ones in terms of energy consumption and emission intensity.

- ▶ To support the decarbonization of the sector, action is needed along two lines:
 - increasing the **energy efficiency of production and electrification of processes and services**, where possible;
 - refinement and scaling-up of alternative technologies, such as **carbon capture and green hydrogen**.
- ▶ In particular, the **direct reduction of iron (DRI)**²⁷, combined with **electric arc furnaces**, would significantly reduce polluting emissions if **green hydrogen** were used to replace methane, both as a reducing agent and as an energy source.
- ▶ While DRI plants are beginning to become widespread, **the production of green hydrogen is far from taking on an industrial dimension**, mainly due to still high costs. On the contrary, the demand for hydrogen and renewable energy needed to produce it are considerable, according to the total decarbonisation scenarios of the sector²⁸.
- ▶ Focusing on **Italy**, where **steel sector accounts for 15% of methane demand from manufacturing**, it would be necessary to **dedicate almost 5 GW of renewable energy**

plants to the decarbonization of the sector to replace with green hydrogen the current consumption of hydrogen produced from methane and only 20%²⁹ of natural gas consumption. Such an amount of renewable energy equals the renewable capacity that came into operation in 2023³⁰.

- ▶ Nevertheless, hydrogen-based DRI technologies represent a key lever for the transition of the steel industry towards **climate neutrality**. Accelerating the green hydrogen production is also an essential way to support the reduction of the carbon footprint of user sectors³¹, thus promoting an overall alignment of industrial supply chains with decarbonization objectives.
- ▶ In this context, it is crucial to support R&D and innovation programs and alliances between industry, financial operators and academia. In this regard, the **IPCEI Hy2Use**³² has had a good national participation: **out of 15 projects funded in the field of industrial applications of hydrogen, 4 are Italian**.
- ▶ Finally, the steel industry is also experiencing the potential of the **digital transition**. The application of IoT sensors, Artificial Intelligence and digital twins allows an improvement in company performance in terms of process optimization, predictive maintenance, efficient use of inputs and supply chain, quality of goods.

²⁷The direct reduction of iron is a process, alternative to the traditional smelting of iron ore, which involves the use of methane gas to produce the metal, with advantages in terms of reducing the carbon footprint and energy efficiency. The use of hydrogen, instead of methane, would further increase the environmental performance of the industry.

²⁸Specifically, the European steel industry would need about 5.5 Mt of green hydrogen in 2050, when today it produces 0.3 Mt. The demand for electricity from renewables, used both for industrial processes and to produce hydrogen, would stand at 400 TWh per year, 8 times current consumption and equal to almost 40% of today's renewable generation. Source: Green Steel for Europe Consortium, Collection of possible decarbonization barriers, March 2021.

²⁹Maximum percentage of hydrogen blending in natural gas allowed without the need for modifications in infrastructures and industrial processes.

³⁰Terna, Monthly Report on the Electricity System, December 2023.

³¹Think, for example, of the automotive sector, which is responsible for 17% of steel consumption in Europe.

³²It is the Important Project of Common European Interest dedicated to the development of hydrogen-related infrastructure and hydrogen applications in the industrial sector.

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