

Industrial Decarbonisation Strategies in Italy and Germany: The Case for Cooperation in Green Steel

by Pier Paolo Raimondi



Auswärtiges Amt

Supported by
the German Federal Foreign Office

Along the journey to achieve the net-zero target by 2050, emissions reductions from all sectors are essential. While the power sector has benefitted from renewables' expansion due to declining costs of these technologies over the past decade, governments are considering measures to foster decarbonisation in the other sectors as well. In this regard, the industry sector – especially energy-intensive industries (EIIs)¹ – is particularly relevant given its environmental footprint and socioeconomic relevance. Therefore, several member states must design and provide a policy framework to accelerate the sector's decarbonisation

¹ EIIs covers iron & steel, non-ferrous metals, chemicals, non-metallic minerals, paper & pulp.

while preserving its competitiveness that is deeply undermined by the energy crisis. Cooperation among large manufacturing countries like Italy and Germany is key to achieving these targets, which will define economic and climate trajectories at the national and European levels.

Energy-intensive industries between decarbonisation and competitiveness

At the European level, the industrial sector accounted for 21 per cent of EU-27 carbon dioxide emissions in 2022² while representing 25 per cent

² Statista, *Distribution of Carbon Dioxide (CO₂) Emissions in the European Union (EU-27) in 2022, by Sector*, April 2024, <https://www.statista.com>.

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of total employment,³ its share of total gross value added was around 17 per cent. Within the industry sector, energy-intensive industries alone are responsible for around 70 per cent of its total emissions. These industries are now facing two existential challenges: a loss of competitiveness and the urgency to adapt to the net-zero scenario. For EU countries, it is essential to address these challenges in a cooperative matter; otherwise, they could face higher competition not only from abroad but also from within the Union, leading to fragmentation and the risk of missing climate objectives with limited economic benefit.

Regarding the economic challenge, EIIs have particularly suffered from the rise of energy prices since mid-2021. As energy costs constitute a large proportion of their total production costs, these industries are increasingly seeing their competitiveness eroding compared to international producers, such as China and India. Although the European Emission Trading System (ETS) contributed to the emissions reduction in the European countries, it also entails higher costs for European EIIs. The additional increase in energy prices in the last three years has put an extra layer of complexity. Even though European countries have extensively addressed this threat by introducing measures to shield consumers and firms from rising energy prices⁴ and by providing state

com/statistics/1240108.

³ World Bank Data, *Employment in Industry (% of total employment) – European Union*, 7 February 2024, <https://data.worldbank.org/indicator/SL.IND.EMPL.ZS?locations=EU>.

⁴ Giovanni Sgaravatti et al., "National Fiscal

aid to companies, industrial production has not recovered.⁵ Furthermore, these emergency measures cannot be pursued in the long term due to economic challenges. While Italy lacks a significant budgetary space, the ruling decision of the German Constitutional Court limits the space of manoeuvre to invest in the energy transition at the national level.⁶

Therefore, there are a number of reasons for cooperation between Germany and Italy in finding new ways to finance the adjustment and protection of their industries. Coordination in terms of industrial policy and funds is needed at the European level and the new European institutional cycle provides an opportunity to deliver in these areas also by allocating and streamlining existing funds. Otherwise, the extensive use of state aid will lead to the fragmentation of the single market due to different fiscal capabilities among member states. In parallel, to further reduce energy costs, European countries will need to bring as much energy as possible into the market in the foreseeable future. This means

Policy Responses to the Energy Crisis", in *Bruegel Datasets*, 26 June 2023, <https://www.bruegel.org/node/7844>.

⁵ Akos Losz and Anne-Sophie Corbeau, "Anatomy of the European Industrial Gas Demand Drop", in *SIPA CGEP Commentaries*, 18 March 2024, <https://www.energypolicy.columbia.edu/?p=19758>; Patricia Nilsson and Sam Jones, "German Emissions Fall by a Fifth amid Stagnant Industrial Output", in *Financial Times*, 4 January 2024, <https://www.ft.com/content/c9aa5a8e-cd6d-4583-b0af-131c8c448913>.

⁶ Max Münchmeyer and Pier Paolo Raimondi, "Between Security and Transition: Prospects for German-Italian Energy Cooperation", in *IAI Commentaries*, No. 23|66 (December 2023), p. 2, <https://www.iai.it/en/node/17912>.

that European countries will need to ensure enough energy imports, while accelerating (ideally the domestic production of) low-carbon solutions.

Linked to this element, the other major challenge for EIIs is represented by the need to adjust their production routes and processes in order to comply with and contribute to EU and national climate objectives. In order to decarbonise the sector, stakeholders can pursue different technological solutions, namely electrification, hydrogen and carbon capture and storage (CCS), depending on political preferences and technological opportunities. Italy and Germany could cooperate in designing the regulatory and financial framework to develop these solutions at the European and national levels.⁷ National best practices and lessons learnt could be mutually shared and replicated. At the same time, companies' transformation is hindered not only by higher capital expenditure (CAPEX) in order to invest in cleaner technological solutions, but also, for many technologies, higher operational expenditure (OPEX) compared the existing fossil fuels-based production routes.⁸ This dual challenge urges governments to find schemes to address it also through the use of EU ETS revenues. Additionally, Italy and

⁷ Pier Paolo Raimondi and Max Münchmeyer, "From Interconnection to Integration: German-Italian Energy Relations and the South2 Corridor", in *IAI Commentaries*, No. 24|03 (January 2024), p. 5, <https://www.iai.it/en/node/17992>.

⁸ Sander de Bruyn et al., "Energy-intensive Industries. Challenges and Opportunities in Energy Transition", in *European Parliament Studies*, July 2020, p. 50, <https://doi.org/10.2861/427814>.

Germany could enhance cooperation in the construction and expansion of energy interconnections to integrate solar generation in the Mediterranean and wind generation in the North Sea.⁹

The case of green steel

Among EIIs, the steel industry is one of the most crucial and promising areas for cooperation between Italy and Germany. Steel, which is an ever-present element of our modern life, accounts for 7 per cent of world's greenhouse gas emissions.¹⁰ The two countries are some of the largest steel producers in Europe and in the world. In 2022, Germany produced 36.8 million tonnes (Mt) of crude steel, being the world's seventh-largest producer and corresponding to 27 per cent of EU crude steel production.¹¹ Italy produced 21.6 Mt being the world's eleventh largest producer and accounting for 16 per cent of the EU's steel production in the same year.¹² The sector accounts for around 4.5 per cent of Italy's GHG emissions and for 7 per cent of Germany's total emissions.

However, the two countries differ significantly regarding the production

⁹ Max Münchmeyer and Pier Paolo Raimondi, "Between Security and Transition", cit., p. 4.

¹⁰ Holger Stamm and Nils Naujok, "Why Steel Can Be an Unexpected Leader in Decarbonization", in *World Economic Forum Agenda*, 29 August 2023, <https://www.weforum.org/agenda/2023/08/why-steel-can-be-an-unexpected-leader-in-decarbonization>.

¹¹ Eurofer, *European Steel in Figures 2023*, May 2023, p. 13, <https://www.eurofer.eu/publications/brochures-booklets-and-factsheets/european-steel-in-figures-2023>; and World Steel Association, *World Steel in Figures 2023*, November 2023, <https://worldsteel.org/?p=47823>.

¹² Ibid.

routes: Germany relies mainly on primary steelmaking (almost 70 per cent of national crude steel production in 2022), while Italy on secondary steelmaking (84 per cent of national steel production).¹³ These two different production routes entail different technological solutions, energy requirements and hence emissions.

Primary steelmaking uses blast furnaces, which are fuelled by coal or coke, and basic oxygen furnaces (BF-BOF) to turn iron ore into steel, while secondary steelmaking uses electric arc furnaces (EAF) to produce steel, thanks to steel scrap. Based on this difference, Italy's steel sector has a below-average carbon intensity (the lowest among the G7 countries), and in general, is in a good starting position for implementing decarbonisation strategies. Italian companies can share expertise and know-how on lower carbon-intense steel production. Although Italy's steel production relies more on electricity, the country will need to speed up renewable installation to further decarbonise its power and steel sectors, reduce its overdependence on natural gas and provide clean electricity at competitive costs. To accelerate renewable deployment, Italy (as well as Germany) will need to continue to accelerate authorisation procedures for projects and investment as already envisaged by the REPowerEU.

For steel decarbonisation, hydrogen is a promising area for both countries. For Germany, hydrogen could be used in direct iron reduction (DRI)

plants in order to replace the current fleets of BF-BOF plants. For Italy, hydrogen would be instrumental in decarbonising its downstream sector where electrification is much more difficult. As of today, a major obstacle to the development and use of (green) hydrogen in the steel sector is economic as its cost is higher than conventional sources. Therefore, the two countries should continue to work on establishing the right incentives for the development of hydrogen and production of 'green' steel. In this sense, Germany announced the use of carbon contracts for difference (CCfDs)¹⁴ that are expected to facilitate investment in low-carbon technologies. Italy should develop a similar measure for its industry.

Although the two countries are working to ramp up renewable generation aimed also at producing green hydrogen domestically, they will need to rely on imports. In this area, the joint commitment to the SouthH₂ Corridor project is particularly relevant, which will transport cheap hydrogen from North Africa to Germany via Italy and Austria. They

¹³ World Steel Association, *World Steel in Figures 2023*, cit.

¹⁴ CCfDs are contracts for difference "on the CO₂ price between the operator of an innovative project and the government, linked dynamically to the actually achieved emissions reductions. As a result, when the CO₂ market price is below the strike price, the CCfD pays out the difference to the CO₂ market price to the project, whereas in case of high CO₂ market prices, the project owner needs to pay back the difference to the agreed-upon price to the government. As a result of the CCfD, the project is incentivised by a constant CO₂ price at the contract price level." See Oliver Lösch et al., "Carbon Contracts for Difference as Essential Instrument to Decarbonize Basic Materials Industries", in *ECEEE Summer Study Proceedings*, 6-11 June 2022, p. 1399-1408 at p. 1400, <https://doi.org/10.24406/publica-596>.

will need to collaborate on regulatory and market frameworks along the infrastructural developments.¹⁵ Moreover, the two countries could enhance cooperation on another technological solution to reduce emissions from the steel industry: CCS. Despite some technological and economic challenges, Italy and Germany are increasingly looking into this solution to preserve their industrial capacity. They will need to collaborate to facilitate a regulatory framework at the European level and invest in joint projects to ramp up the development of CCS.

The two countries could also collaborate on further research and development for green steel production given their large producer status by working on joint research projects and existing network of companies and academia.¹⁶ This network would also be crucial to help reskill the workforce in the industry in line with technological and production developments. While great attention has been devoted to the supply side, it is equally crucial for the two countries to cooperate in encouraging the demand for clean products. To pull demand upward, governments could revise and promote the use of public procurement requirements. Moreover, the two countries could work – both bilaterally and at the European level – towards promoting green lead market¹⁷ by

¹⁵ Pier Paolo Raimondi and Max Münchmeyer, “From Interconnection to Integration”, cit.

¹⁶ Alessio Sangiorgio, “Civil Society and the Energy Transition: Fostering Multi-Stakeholder Dialogue in Germany and Italy”, in *IAI Commentaries*, No. 24|20 (May 2024), <https://www.iai.it/en/node/18443>.

¹⁷ Lead markets generally denote a

setting standards and regulations. Only through incentives on both the supply and demand side, the two countries’ steel sector could remain competitive vis-à-vis their international competitor and lead the transformation of the sector.

Looking ahead

Today, European countries and industries are facing multiple challenges, spanning from the energy and climate crisis to a loss of industrial competitiveness and growing geopolitical and industrial competition from international players. To overcome these challenges countries like Italy and Germany need to find common solutions to adapt their existing industries to the new international and climate scenario. Without a common strategy and convergence in terms of policy, regulations, infrastructure and investments, European industries may lose ground vis-à-vis external competitors. The relevance of the industrial sector both in Italy and Germany provides a unique opportunity for further bilateral cooperation that could shape the important decision of the upcoming Commission.

The steel sector represents a perfect case study as it will imply great coordination in a variety of domains, such as technological solutions, standards, infrastructure and regulatory aspects.

geographically distinct submarket that pioneers the successful adoption of an innovative design and/or product. In green lead markets, this innovation refers to products being more sustainable and low-carbon. See Bellona, *Lead Markets 101*, 20 January 2023, <https://bellona.org/?p=33496>.

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As the European integration process started with the steel industry and the creation of the European Coal and Steel Community in the aftermath of World War II, the steel industry can prove once again its crucial role in bringing together European countries amid the multiple transformations and challenges at the global level.

24 July 2024

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