

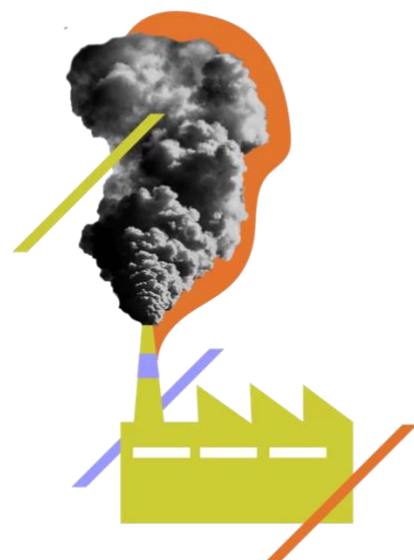


THE ITALIAN CLIMATE CHANGE THINK TANK

THE NATIONAL ENERGY AND CLIMATE PLAN

A plan for action

THE PLAN AND THE
MANUFACTURING INDUSTRY



THE PLAN AND THE MANUFACTURING INDUSTRY

Manufacturing holds a pivotal position in the transition for several reasons. Firstly, there is a pressing need to decarbonise production processes, which often involve intricate and currently uneconomical technological solutions. Secondly, manufacturing generates technologies that have a broad impact across various sectors, including transportation, residential living, and electricity production. For instance, which industries contribute to electric mobility, energy-efficient buildings, and the widespread adoption of renewable energy sources? The Plan should allocate a specific chapter to the manufacturing sector, where critical supply chains for decarbonisation can be identified and linked with specific policies. In essence, the Plan should not only serve as a tool to identify direct emission reductions in the industrial sector but also steer the country's development towards products and services within decarbonised markets. This is crucial considering the escalating competitiveness of these markets, especially given the significant transformations in finance.

The regulatory framework¹ suggests that the industrial transformation pathway is inevitable. Therefore, instead of dwelling on the possibility of this transformation, the focus should shift to assessing its costs and opportunities. If the aim is global decarbonisation of processes and products, relocating production to countries with less ambitious environmental goals is not a favourable option. Consequently, the decarbonisation pathway should align national CO2 targets with competitiveness in global markets. Achieving this alignment will require diplomatic efforts, including within the G7, aimed not at protectionism but at steering global markets towards low-carbon goods and services, with aspirations for competitiveness in mind.

The manufacturing sector remains the backbone of the Italian economic system. Before the pandemic², it was populated by around 360 thousand companies, accounting for 250 billion euros of added value, 33.5 billion euros fixed investments and 3.8 million employees. Measured in terms of value added at constant prices, the Italian manufacturing sector ranks **second in the European Union and eighth in the world**³.

Over the past thirty years, our country has undergone a significant transformation process, with the manufacturing sector's share of GDP (Gross Domestic Product) falling from 20.1% in 1990 to 14.9% in 2021⁴. In the same period, there has been a worrying loss of competitiveness. Italy currently ranks eleventh in the world in UNIDO's Competitive Industrial Performance Index (CIP), marking a decline from its fourth-place position in 1990.

Part of this trend can be attributed to the gradual fragmentation of the Italian productive sector, which began with the industrial restructuring of the 1970s⁵. This sector is now largely dominated by small and medium-sized enterprises (see [box](#) below). Simultaneously, the Italian economy has

¹ Particularly the [CSRD](#), [the Taxonomy Regulation](#), the [revision of the ETS Directive](#), the [CBAM Regulation](#), [the use of ESRS standards](#)

² The last significant figure reported by ISTAT is 2019.

³ UNIDO data for 2022, measured in US dollars at constant 2015 prices.

⁴ In terms of this parameter, Italian manufacturing falls to 10th place in the EU, trailing behind countries such as Czechia (21.1%), Germany (18.9%), Poland (16.7%), and others

⁵ This is a central theme in the literature on the history of Italian industry. See: Graziani, A. (2000). *The Development of the Italian Economy*, Bollati Boringhieri; Barca, F. (1997). *History of Italian Capitalism*, Donzelli; Bianchi, P. (2013). *The braked run-up, the Mill*

experienced the decline and downsizing of its large high-tech manufacturing sector. This sector was once represented by prominent companies such as Fiat, Montedison, Pirelli, Olivetti, Italcementi, Ansaldo, and others, which were the only ones capable of competing on a global level.

Italy must confront the challenge of industrial transformation with an awareness of its strengths and weaknesses. Decarbonisation presents **both a challenge and an opportunity**. These two factors are intrinsically linked and must be considered as synergic within the Plan.

BOX – THE WEIGHT OF SMALL AND MEDIUM-SIZED INDUSTRY IN THE ITALIAN MANUFACTURING SECTOR

The national manufacturing system is characterised by a high degree of fragmentation, dictated by the significant weight of small, medium and micro-enterprises (SMEs), in terms of number, value added and employees (Figure 1). Figures reported by the OECD for 2019 shows that Italy's manufacturing companies with 1 to 9 employees accounted for 21.2% of the total number of employees in the manufacturing sector, compared to 10.3% in France and 5.9% in Germany. Meanwhile, the share of employees in manufacturing companies with more than 250 employees was only 27.7% of the total in Italy compared to about 61% in France and Germany.

The chronically small size of Italian firms can present both obstacles and opportunities for innovation in the context of decarbonisation. SMEs are characterised by a high degree of flexibility and product specialisation, but they often encounter structural difficulties in accessing credit to finance the necessary investments for their growth and innovation.

If properly supported, SMEs can be a key source of emissions reduction. Despite being largely concentrated in non-ETS sectors, SMEs have the potential to respond quickly to market challenges, thanks to the decentralised energy solutions they can provide and to their contribution to the circular economy. The Cerved SMEs Report⁶ confirms that the transition process requires significant investments, but also indicates that SMEs, with sufficient support from the banking system, are generally capable of accommodating them.

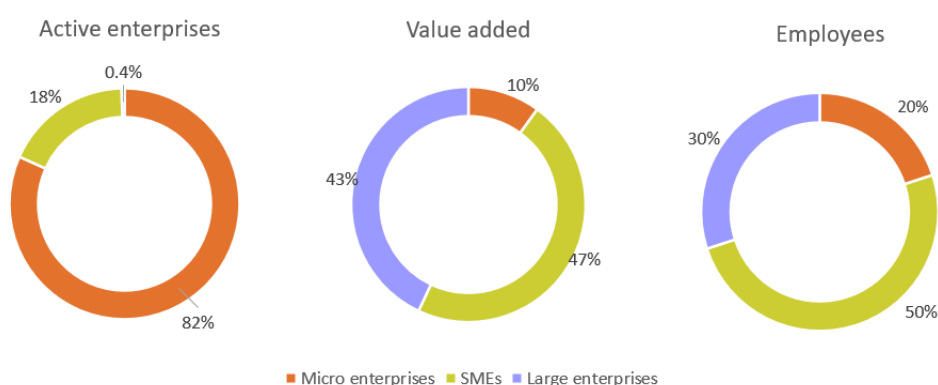


Figure 1 – Characterisation of the Italian manufacturing industry. ECCO elaboration based on ISTAT 2019 figures.

⁶ "Cerved SMEs Report", Cerved, 2022

The manufacturing industry is responsible for about 22% of national greenhouse gas emissions⁷ (31% when including emissions from electricity use⁸). The sector is characterised by high levels of process emissions (chemicals, cement, steel) and their energy uses, which are significantly dependent on natural gas⁹. As shown in Figure 5 below, the industrial sectors with the highest share of natural gas consumption are non-metallic minerals (21% of natural gas consumed by industry in 2021), chemicals (19%), paper and printing (15%)¹⁰.

In addition, the projections of the 2030 reference scenario¹¹ indicate that the manufacturing sector will still be the second largest emitter after transport, with a share of 21% of the national total, accounting for 21% of the national total, a figure essentially unchanged from the present day.

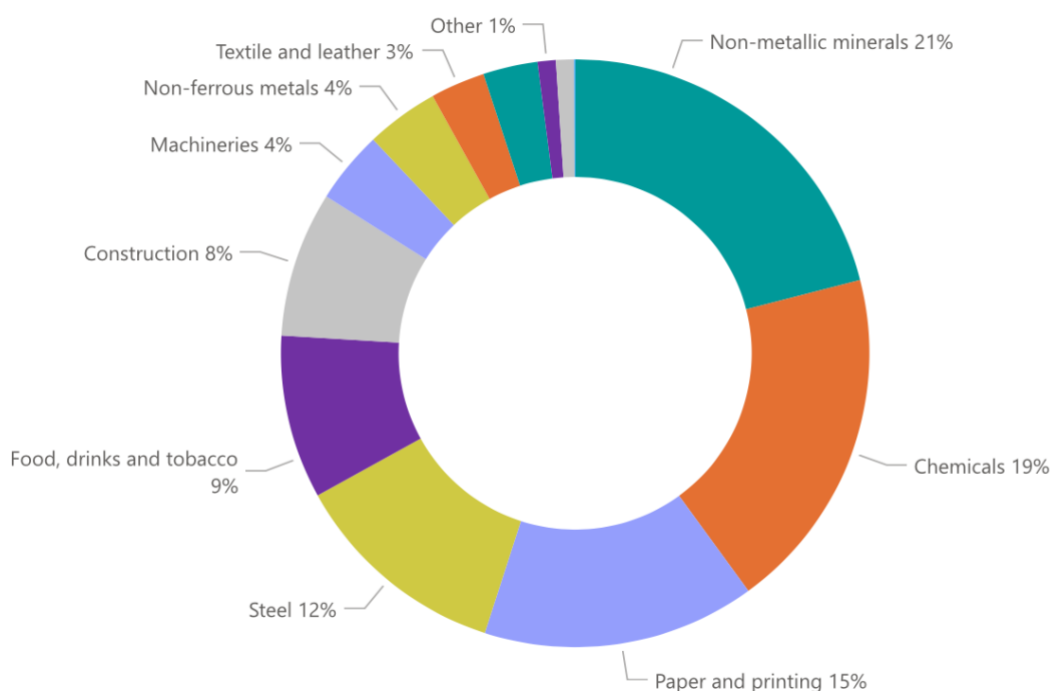


Figure 2 – Breakdown of natural gas consumption by industrial sub-sectors in 2021. Total: 8.9 Mtoe¹²

The national manufacturing industry is composed by a heterogeneous set of sub-sectors, each characterised by distinct processes and products. These sub-sectors are interconnected through distributed and intricate supply chains. However, **in the current proposal for the Plan, the manufacturing sector is categorised simply as an "industry", lacking further sub-sectoral specifications**. There is a deficiency in specific sectoral analyses dedicated to better understanding their potential contribution to the decarbonization and development of the country. The industry seems to be treated as an ancillary element in comparison to energy policies and is sporadically

⁷ ECCO elaboration based on ISPRA figures.

⁸ ECCO elaboration based on ISPRA and Eurostat figures.

⁹ 35% of the energy demand of the industrial sector is met by natural gas (ECCO elaboration from Eurostat figures)

¹⁰ "Simplified energy balance", EUROSTAT.

¹¹ After the transport sector with 26%

https://www.isprambiente.gov.it/files2023/pubblicazioni/rapporti/rapporto_384_2023_le-emissioni-di-gas-serra-in-italia.pdf

¹² ECCO elaboration based on EUROSTAT data.

referenced in the chapter on 'Research, Innovation, Competitiveness'. Once more, there is a failure to conduct impact analysis on both the policies already in place and those planned for implementation. Furthermore, there is a lack of prioritisation of interventions based on their anticipated effects.

The complexity of the industrial transformation challenge underscores the importance of formulating policies with greater sectoral specificity to ensure their efficacy in both the short term (by 2030) and the long term (by 2050). This requires policies to be customized and categorized according to reference sectors, taking into account their projected direct or indirect impacts over both time frames.

As far as the current NECP is concerned, the following aspects could be considered:

- i) **Enhancing energy efficiency and decarbonisation in industry:** reducing emissions from direct (and indirect) consumption of fossil fuels for industrial energy usage.
- ii) **Transitioning *hard-to-abate* sectors:** reducing direct emissions from *hard-to-abate* industrial processes through the formulation of innovation policies with medium to long-term effects.
- iii) **Developing strategic supply chains for decarbonization:** identifying strategic manufacturing supply chains for decarbonisation technologies, namely industrial supply chains enabling decarbonisation while not significantly impacting emissions which require a favourable legislative, regulatory and financial environment.

The development of the decarbonisation industry aims to capitalise on opportunities in new markets and reduce dependence on foreign countries. It also seeks to generate positive spillovers in terms of direct and indirect employment, as well as complementary investments.

The Plan should be looking at: (i) assessing the energy requirements and security of supply of the manufacturing industry; (ii) identifying opportunities for investing in technological solutions for decarbonisation in the medium and long term; and (iii) exploring opportunities for creating and enhancing new or existing industrial supply chains.

The regulatory framework should not rigidly dictate the approach that needs to be pursued. A strategy for the manufacturing industry in the Plan can be effective if it guides industrial operators and provides financial support towards defined objectives, with reduced uncertainty through the long-term commitment of the public counterpart¹³.

i. Enhancing energy efficiency and decarbonisation in industry

A strategy to decarbonise the manufacturing industry should begin with an analysis of its energy needs. It should also address the specific requirements of its sub-sectors. In particular, the Plan should include:

- A strategy for how to decarbonize the power sector¹⁴ through the installation of large renewable plants serving production plants. The decarbonisation of the electricity sector is

¹³ See also [paragraph 3.2](#)

¹⁴ The measures currently included in the REPowerEU move in this direction. <https://eccoclimate.org/it/un-anno-di-repowereu-gli-effetti-sul-pnrr-italiano/>

pivotal for all other sectors. The manufacturing sector appears to be key to its realisation, given the scale of the projects and the scale of investments.

- A strategy for the usage of natural gas and its substitutes, prioritising industrial applications requiring high- temperature heat that cannot readily substitute it in the shorter term.
- A set of measures to enhance the energy efficiency of industrial processes as well as foresees electrification of low temperature process heat to reduce emissions. As described in the subsequent dedicated sectoral chapter, a preliminary analysis highlights how exploiting the potential of electrification of low- temperature heat in industrial processes¹⁵, particularly in non-ETS sectors, can contribute to the national reduction target.

ii. The transition of hard-to-abate sectors

In *hard-to-abate* sectors, CO₂ emissions derive from energy-intensive activities, such as the use of high-temperature heat, or from industrial processes in which the production of greenhouse gases is directly linked to the chemical reactions intrinsic to the production process. Technological solutions, where available, are often far from commercialisation at an industrial scale.

The Plan should identify the technological solutions that can be considered strategic and in which it intends to invest, highlighting opportunities and risks involved. For example, the current Plan calls for the use of CCS (Carbon Capture and Storage) (see also Box 5 in chapter 'Industry sector' chapter). However, given the technological and economic sustainability uncertainties of this technology, it would be important to consider the feasibility of its use from several points of view. In addition to its legal feasibility, it would be important to deploy this technology where it could be most effective. For example, on process emissions from *hard- to-abate* sectors.

Secondly, the Plan should include a survey of the available financial instruments and funds for financing these technologies, so as to provide a medium to long-term orientation to investors. Such instruments should consider the uncertainty regarding the economic return on investments, as well as the potentially higher operational costs associated with implementing such technologies (see also Chapter 3.2, 'Finance and investments in the Plan').

iii. Development of strategic supply chains for decarbonisation

The Plan should delineate the manufacturing industry's contribution to fulfilling domestic production needs for technologies essential to decarbonization, considering variations in propensity to import across different production chains.

In particular, the Plan should specify how the country intends to **strengthen its manufacturing capacity** in what the European Union – in its Net-Zero Industry Act – defines as **'strategic net-zero technologies'**. These include, for example, the production of solar panels, wind turbines, batteries, electrolyzers and heat pumps. More broadly, the industrial strategy outlined in the NECP should encompass all technologies and products essential for decarbonisation, which could be categorised as 'net zero' products. This includes materials or technologies for enhancing the energy efficiency of buildings, such as the production of flat glass or windows, insulation materials, as well as

¹⁵ In particular, in sectors which are, at least in part, not covered by the ETS and for which the emissions reduction by 2030, could bring significant benefits for Italy in achieving the Effort Sharing objectives.

technologies aimed at expediting the electrification of the automotive fleet, such as electric motor components.

Without delving into the specifics of each individual supply chain, which should be developed separately, the Plan should outline a set of national objectives regarding the **need for scaling up production**. The Plan should detail how these initiatives will contribute to the broader decarbonisation goals, providing insight into the policies for different strategic supply chains. These policies should be differentiated between indirect and direct measures influencing demand or supply aspects. This approach, preceded by an analysis of the technical and market characteristics of the supply chain (with reference to Italian specialisation), enables the identification of the most suitable measures to achieve the objectives of enhancing national production capacity within that specific value chain.

An example of how these industrial strategies can be conceptualised for the various supply chains considered strategic is shown in [Table 1](#).

	Direct (policies that directly affect investment in decarbonisation products/technologies)	Indirect (policies that provide for the investment of producers of decarbonisation products/technologies)
Supply	<ul style="list-style-type: none"> • Tax credit or other incentives for manufacturing in one or more segments of the 'net zero product' value chain e.g. heat pumps, batteries • Capital transfers and/or subsidized financing to companies for investments conditional on increasing the manufacturing capacity of 'net zero products' (provided that this is in line with decarbonisation objectives) • Prizes for technological innovation (incremental and radical) on net zero products • Tax relief for the recruitment of highly qualified research staff in net zero product supply chains • Guarantees and preferential credit for exporters of <i>net zero</i> products • Tariff reductions and monetary incentives for companies importing raw materials and machinery that are essential to the manufacturing process of net zero products 	<ul style="list-style-type: none"> • Investments in enabling infrastructure and logistics to promote the distribution of net zero products (ports, rail freight transport, specialized shipbuilding, etc.) • School curricula and vocational training schemes specific to net zero products • Establishment of environmental standards for imported technologies and products • Conditional tax relief for the decarbonisation of production processes, when these imply the adoption of enabling technologies produced in Italy • Measures restricting imports of competing finished products that do not reflect pre- established environmental or social criteria
Demand	<p>Policies that can stimulate demand for Net Zero Products:</p> <ul style="list-style-type: none"> • Adoption of standards for the definition of net-zero products and requirements to identify when and which critical elements of the supply chain are developed at the domestic level • Public procurement oriented towards favouring <i>net zero</i> products, particularly linked to domestic production chains • Auctions for the installation of renewable energy infrastructure, with more favourable requirements for the use of 'net zero' products linked to domestic production chains 	<p>Policies that can stimulate demand for Net Zero Products:</p> <ul style="list-style-type: none"> • Preferential financing for investments requiring the adoption of net zero products from domestic supply chains • Selective incentives for firms and households adopting net-zero technologies from domestic supply chains • Labelling systems that highlight 'net zero' products, with particular emphasis on those from domestic supply chains

Table 1 – Matrix of industrial policy measures for the development of manufacturing supply chains in net zero technologies considered strategic for decarbonisation. This scheme, borrowed from [IEA 2022](#), must be adapted to the technical and market characteristics of the specific supply chain, considering the existing Italian specialisation in the various segments of the value chain.



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