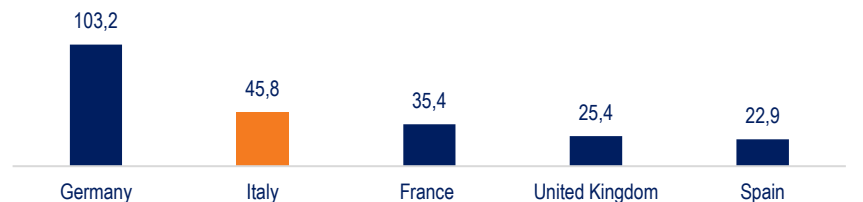


1 THE ECONOMIC AND OCCUPATIONAL ROLE OF THE PLASTICS INDUSTRY IN ITALY, THE ECONOMIC AND OCCUPATIONAL MULTIPLIERS AND RELATIONS WITH OTHER PRODUCTIVE SECTORS IN THE COUNTRY

The Italian plastics industry has high economic and occupational relevance...

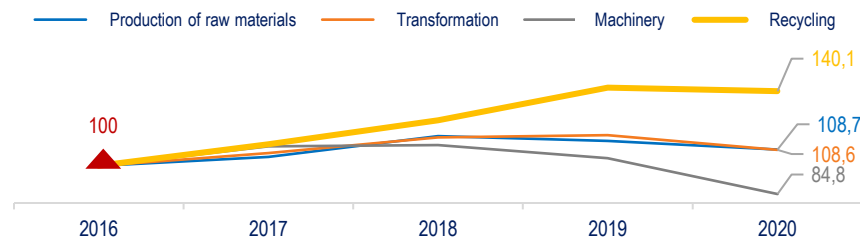
- The Italian plastics industry generated **€45.8 bln in turnover** in 2020 (8th largest manufacturing sector in Italy), **€12.7 bln in Value Added** (5th largest manufacturing sector in Italy) and **€19.9 bln in export** (9th largest manufacturing sector in Italy), being more resilient than the manufacturing average in 2020 compared to 2019 (turnover -7.3% vs. -12.4% manufacturing and Value Added -0.8% vs. -12.0% manufacturing)
- At the European level, the Italian plastics industry is **2nd** in turnover behind Germany, with an overall value of **14.2%** of the total (vs. 31.9% in Germany)
- In Italy, the plastics industry has **more than 7,000 companies** (1st in the EU) and employs around 180,000 people, which is more than the automotive sector and equal to **4.7%** of employment in the Italian manufacturing sector as a whole



Turnover of the plastics industry in the European Big-5 (values in billion of Euros), 2020.
Source: The European House - Ambrosetti elaboration on Aida Bureau Van Dijk and Eurostat data, 2022.

...with a growing trend in recent years with regard to recycling...

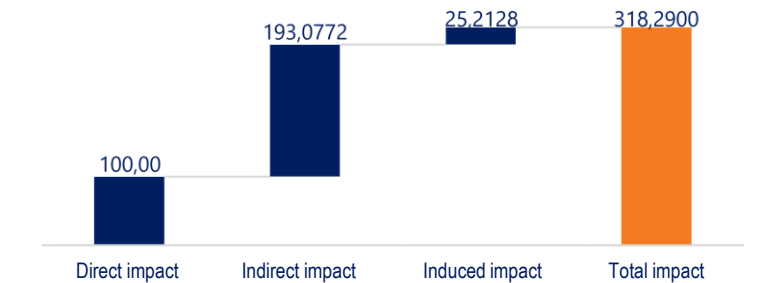
- The **transformation phase** generates the highest share of turnover in the Italian plastics supply chain (**74.8%** vs. 67.3% EU average, a difference of 7.5 percentage points)
- However, over the last 5 years, the **recycling phase** is the one with the largest increase in turnover (**+40%**) and Value Added (**+72%**), as well as being the phase with the largest increase in productivity (**+18%** over the last 5 years)



Trend in turnover of companies by phase of the plastics value chain in Italy (2016 = 100), 2016-2020.
Source: The European House - Ambrosetti elaboration on Aida Bureau Van Dijk data, 2022.

...and with growing economic and occupational multipliers compared to 2013

- The European House - Ambrosetti has updated the **economic and occupational multipliers of the plastics industry**, as calculated in the 2013 Study dedicated to the plastics industry
- The economic multiplier is **3.18 (+33%** vs. 2013 Study): for every 100 Euro of direct investment in the plastics sector, 218 additional Euros are activated in the related chain
- The occupational multiplier is **2.77 (+1.1%** vs. 2013 Study): for every 100 direct jobs in the plastics sector, 177 additional jobs are activated in the related chain



Direct, indirect and induced impact generated by additional investment in the plastics sector in Italy (Euros).
Source: The European House - Ambrosetti elaboration on Istat data, 2022.

2 THE EVOLVING VISION AND THE TECHNOLOGICAL TOOLS AND SOLUTIONS TO IMPLEMENT THE CIRCULAR ECONOMY PARADIGM IN THE PLASTIC INDUSTRY

Within the Study, an **evolving vision** was defined to outline the role of plastics within the Circular Economy paradigm:

«Moving from an approach focused exclusively on plastic waste management to a model aimed at maximising the benefits achievable through **technological innovation in the 3 phases identified in the Study (input, product and process innovation and end-of-use and new life)** and which envisages the enhancement of **complementarity between chemical and mechanical recycling and the growth of organic recycling for biodegradable plastics**»

The technology mapping included an analysis of published patents (about **300 patents** filed by the EPO – European Patent Office), academic literature (about **1,500 academic-managerial papers** related to plastics innovations) and benchmark applications (about **150 applications** and examples covering the three life phases of plastics)

1. SUSTAINABLE INPUTS

-17% of virgin plastic material required as input due to the adoption of new engineering and design principles (potential reduction ranges from **-13%** to **-38%**)

2. PRODUCT-PROCESS

-15% input material required (the potential ranges from **10%** to **20%**)
-20% of waste from production cycles (the potential ranges between **10%** and **25%**)

3. END-OF-USE AND NEW LIFE

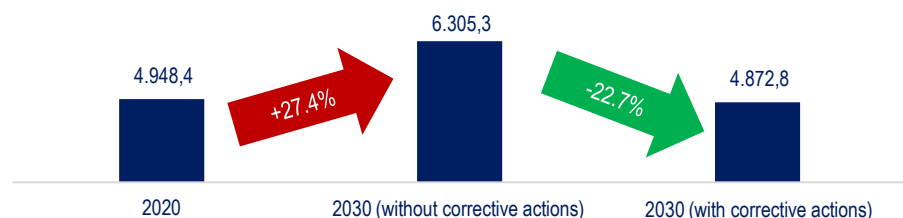
50.3% mechanical recycling capacity due to a 10% to 25% improvement in sorting efficiency
6.3% chemical recycling through pyrolysis technologies up to a maximum of **11.3%** through the development of depolymerization and gasification technologies

3 THE BENEFITS FOR ITALY FROM A HIGHER CIRCULARITY OF THE PLASTICS INDUSTRY

The amount of plastic waste in 2020 was reconstructed by The European House - Ambrosetti in collaboration with ISPRA and it is estimated equal to **4,948 thousand tonnes**. Through the CAGR* 2016-2020 the plastic waste in 2030 was estimated (6,305 thousand tonnes, **+27.4%** vs. 2020). Corrective measures applied to this value are estimated to reduce the amount of plastic waste by 1,432 thousand tonnes (**-22.7%** vs. the trend scenario to 2030)

Two scenarios have been realized with reference to the different types of plastic treatment by 2030, differentiated according to the **penetration capacity of chemical recycling**, deriving from the technology analysis and Italian mix of plastics: in the **Scenario 1**, based on the implementation of pyrolysis plants, chemical recycling reaches **6.3%** of the total amount of plastic waste by 2030; in the **Scenario 2**, thanks to other currently "less mature" technologies, such as depolymerization and gasification, chemical recycling reaches **11.3%** of the total amount of plastic waste by 2030

REDUCED PLASTIC WASTE

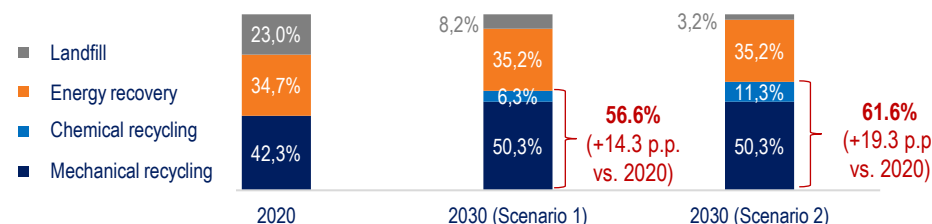


Quantity of plastics waste in Italy (thousands tonnes), 2020 and 2030 (trend and with corrective measures).
Source: The European House - Ambrosetti elaboration on ISPRA and Federchimica - PlasticsEurope Italia data, 2022.

(*) Compound Annual Growth Rate

-1,432 thousand tonnes (-22.7%) due to the application of corrective measures such as **product and process innovations** (-1,223 thousand tonnes, **85%** of the overall reduction) and **regulatory measures** (208.6 thousand tonnes, **15%** of the overall reduction)

INCREASED PLASTICS RECYCLE



Share of plastic waste by treatment type (percentage values on total), 2020 and 2030 (Scenario 1 and 2).
Source: The European House - Ambrosetti elaboration on ISPRA and Federchimica - PlasticsEurope Italia data, 2022.

Already in Scenario 1, **Italy reaches the target of 10% of waste to landfill in 2030, 5 years ahead** of the EU target (2035)

4 THE 7 LINES OF ACTION IDENTIFIED TO ENHANCE CIRCULARITY IN THE ITALIAN PLASTICS INDUSTRY

- Increasing **separate collection** as an **essential prerequisite** for ensuring the circularity of the plastics industry
- Supporting the **growth of the Italian bioplastics industry** and encouraging increased **organic recycling for biodegradable plastics**
- Review the current **Extended Producer Responsibility (EPR) mechanisms** with the aim of **simplifying processes** and making the plastics industry more circular
- Speeding up environmental **authorization procedures** and reducing the **'NIMBY syndrome'** to reduce the waste service divide
- Fostering **greater synergy between public and private actors** in order to promote virtuous processes of **innovation in the plastics sector**
- Facilitating the **creation of an outlet market** for "End of Waste" materials
- Adopting an **integrated value chain approach** to increase the sharing of regulatory choices