

THE CHEMICAL INDUSTRY AS AN ENABLING COMPETENCE FOR MADE IN ITALY AND FOR SUSTAINABLE DEVELOPMENT

*The decalogue for the green transition
of the chemical industry in Italy*

April 2024

Summary of the Proposing Parties

*Federchimica, Unionchimica and the Sectoral Trade Unions
FILCTEM-CGIL, FEMCA-CISL, UILTEC-UIL and UGL chimici*

Il futuro, oggi



The European House
Ambrosetti

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THE ROLE OF THE CHEMICAL INDUSTRY FOR ITALY

THE STUDY'S MISSION

To define an **evolutionary vision** that outlines **the role of the chemical industry in Italy** and demonstrates its **contribution** in terms of **economic-employment activation**, its ability to **stimulate the evolution of related supply chains** and its role as an **enabler of the ecological transition**

THE OBJECTIVES OF THE STUDY

- Be a **supporting tool** for defining **guidelines of an industrial policy for the development of chemistry**, identifying **priority and cross-cutting needs** with a focus on the role of SMEs
- Qualify the **role of chemistry in Italian production chains** by highlighting its **distinctive factors** and its ability to act as an **enabler of sustainable transition** in different production areas
- Analyse the **regulatory framework** for the **green transition** of the chemical industry highlighting **current and prospective challenges**
- Develop a **clear strategic vision, with associated guidelines and industrial policy tools** to accelerate and optimise the pathways of the chemical industry in Italy
- Quantify the **economic and employment benefits** arising from the evolution of the chemical industry in Italy by qualifying the **priority solutions and investments** planned by companies

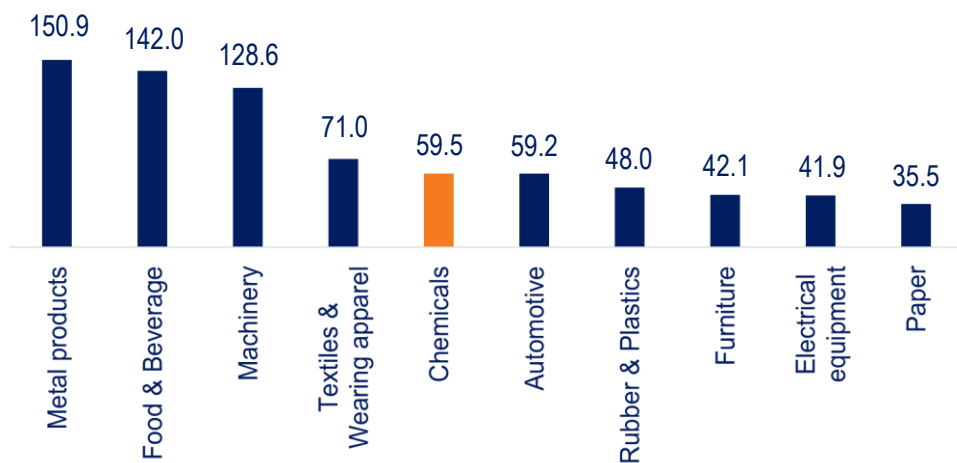
TWO FUNDAMENTAL PREMISES TO THE STUDY

1. The **chemical industry is a strategic sector for Europe and Italy**: the EU is the **2nd** largest producer in the world with a share of around **15%** (593.7 billion euros in 2021), while Italy - with 59.5 billion euros in turnover - is the **3rd** largest European producer with a share of around **10%** (after Germany and France) and the **10th** largest in the world*
2. The chemical industry is an **enabling competence for Made in Italy and sustainable development**: chemical products are present in **95% of all manufactured goods in daily use** and have a **predominantly industrial application (71% of the total)**

(*) After China, USA, Japan, Germany, South Korea, India, France, Brazil, Taiwan.

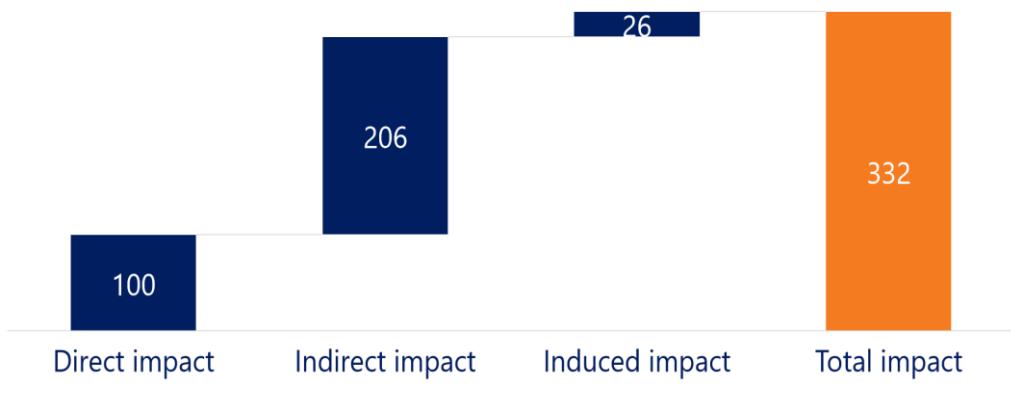
INDUSTRIAL RELEVANCE AND Pervasiveness in the Economy

- Chemical industry enterprises in Italy account for **14.1%** of the EU total (about 2,800 enterprises), **the highest value among European countries** (vs. 12.9% France and 12.7% Germany)
- The chemical industry in Italy is the **5th largest manufacturing sector** by turnover with a share of 6.3% of the total in 2021



Top 10 manufacturing sectors in Italy by turnover (values in billion euros), 2021. Source: elaboration by The European House - Ambrosetti on Federchimica and Istat data, 2024..

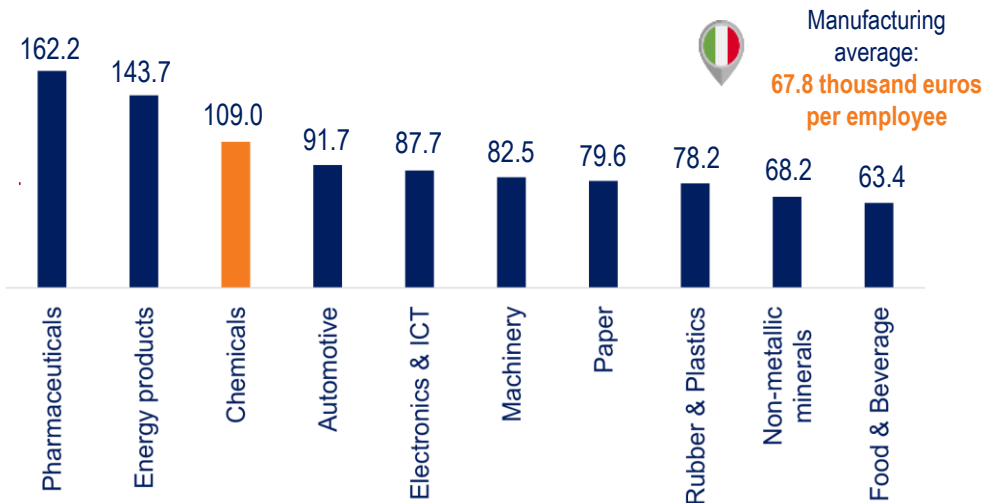
- The **economic multiplier** of the chemical industry in Italy is among the highest, qualifying and pervasive and is **3.32**: for every additional 100 euros generated by the chemical industry in Italy, an additional 232 euros are generated in the extended supply chain
- The chemical industry is the manufacturing sector that has the **most pervasive direct economic impact on other manufacturing sectors**: it is both the sector that **most diversifies its direct economic benefit** in the Italian economy and the one that **most diversifies its sales** in the country's economy



Direct, indirect and induced impact generated by the incremental added value of the chemical industry (euros). Source: elaboration The European House - Ambrosetti on Istat data, 2024.

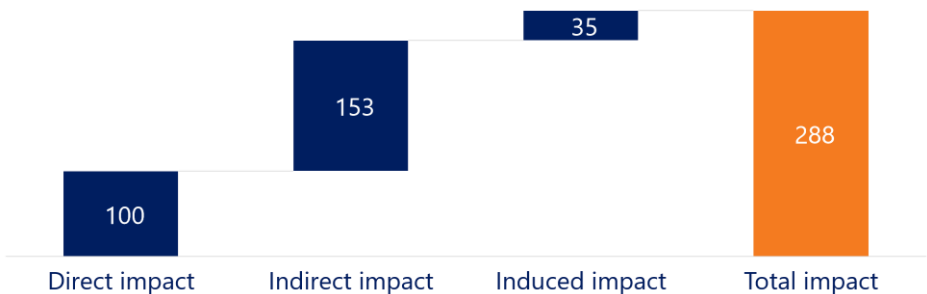
SOCIO-OCCUPATIONAL RELEVANCE AND QUALITY OF HUMAN RESOURCES

- Italy is the **3rd** largest country in EU-27 in the chemical industry with a total of 114,000 **employees** (9.5% of the EU total in 2021)
- The chemical industry in Italy is highly productive: with **109 thousand euros per employee**, it is the **3rd** largest manufacturing sector by productivity



Top 10 industrial sectors in Italy by productivity (Value Added per employee, values in thousands of euros), 2021. Source: elaboration The European House - Ambrosetti on data and Istat, 2024

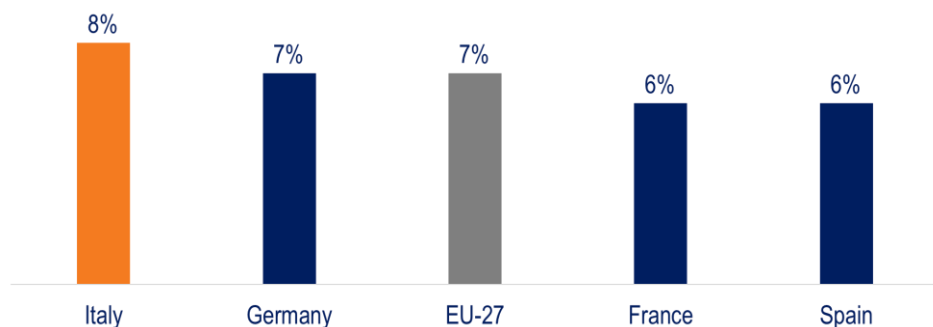
- A qualifying aspect of the chemical industry in Italy is the **collaboration between the Social Partners**: it is the **1st** sector to have formalized in the **National Collective Labour Agreement** a definition of **Social Responsibility** and to have established sectoral funds for **supplementary pensions** and **health care**
- **96%** of employees have a **permanent contract** (+8 points vs. manufacturing average) and **23%** of employees are college graduates, which is double the manufacturing average (11%)
- **SMEs support more than half of the chemical industry employment in Italy** (55% vs. EU-27 average of 33%), the highest value among the main European countries
- The **employment multiplier** of the chemical industry in Italy is **2.88**: for every 100 direct workforce units in the chemical industry, an additional 188 workforce units are activated in the related supply chain



Direct, indirect and induced employment impact in the chemical industry (workforce units).
 Source: elaboration The European House - Ambrosetti on Istat data, 2024.

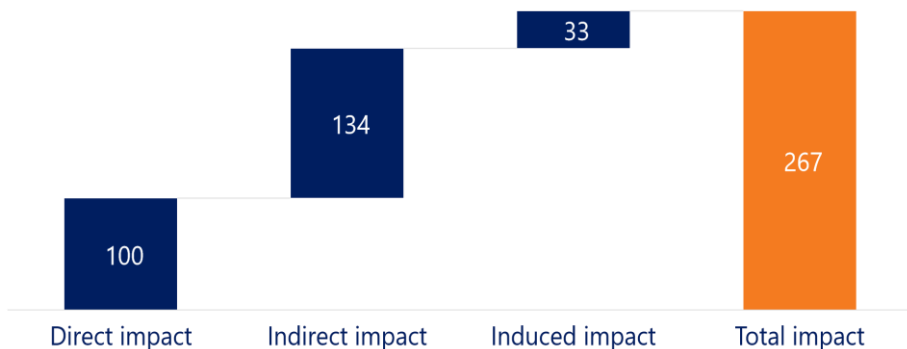
A DRIVING FORCE FOR RESEARCH AND DEVELOPMENT

- In 2021, chemical industry companies in Italy had invested over **670 million euros** in R&D, with R&D spending as a percentage of turnover higher than the manufacturing average (**1.4%** vs. 1%)
- In the last decade (2011-2021), the personnel dedicated to R&D in the Italian chemical industry grew by **+73%** (from about 5,000 to almost 9,000 employees), **+8 percentage points** higher than the manufacturing average (+65%)
- The share of employees dedicated to R&D in the chemical industry in Italy is **8%**, **1st country in the EU-27 among the Big-4 countries**



Share of chemicals employees dedicated to in Research and Development in the European Big-4 (% of the total), 2020 Source: elaboration The European House - Ambrosetti on data and Eurostat and Federchimica, 2024.

- In Italy, the chemical industry **ranks 2nd** in terms of companies with **in-house R&D** (**75%** of the total), behind only the pharmaceutical industry (84%)
- The **R&D multiplier** of the chemical industry in Italy is **2.67**: 100 euros of R&D investment in the chemical industry activates 167 additional euros of Value Added in the related supply chain



Direct, indirect and induced impact of R&D in the chemical industry (euros). *Source: elaboration by The European House - Ambrosetti on Istat data, 2024.*

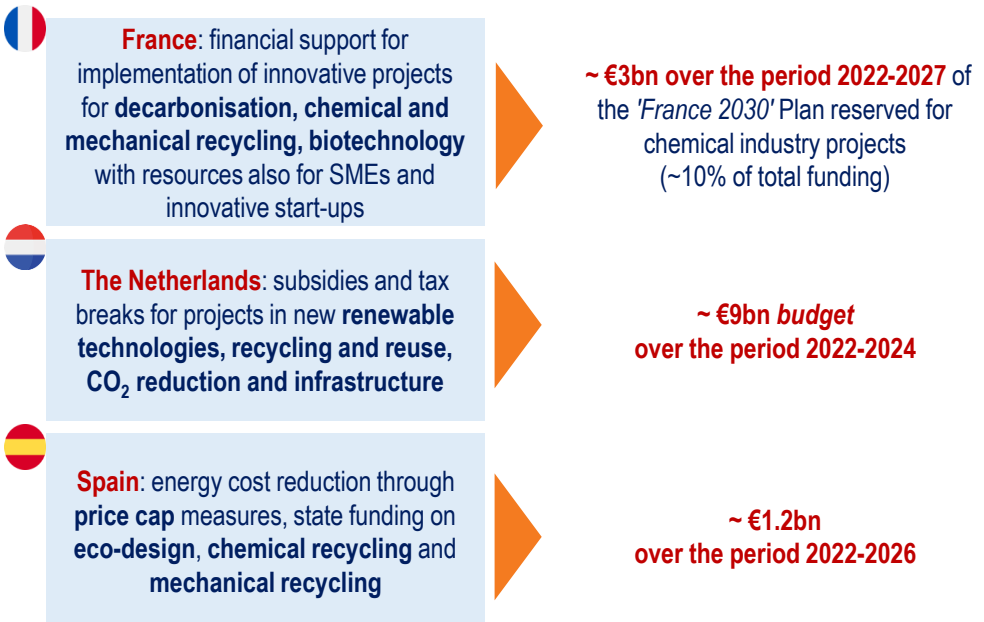
THE GREEN TRANSITION OF THE CHEMICAL INDUSTRY

THE TRANSITION PATHWAY

- The **Transition Pathway for the Chemical Industry**, published by the European Commission on **January 27, 2023**, identifies **the actions and conditions needed** to achieve the dual transition (green and digital) and improve the resilience and sustainability of the chemical industry in EU countries
- The document consists of **180 actions** grouped into **26 areas** and aims to facilitate the transition of the chemical industry along **4 'axes'**: 1) Circularity; 2) Digitalization; 3) Climate neutrality; 4) Safety and sustainability of products and processes



The green transition of the chemical industry is now at the centre of the policy agenda of major European countries



THE TRANSITION REQUIRES SUBSTANTIAL INVESTMENT

CAPEX investments of approximately **€20bn** (8.3% of the EU total of €238bn) are estimated to be required to achieve **the green transition of the chemical industry in Italy**



To enable the green transition, in line with the *Transition Pathway*, an **additional €0.8bn per year** will therefore be required (~40% of the average annual value invested by industry over the five-year period 2016-2020 of €2bn)



Including operating costs (OPEX, estimated at **€11.5 billion**), the green transition of the chemical industry would require **more than €30 billion** by 2050

AN EVOLUTIONARY VISION

An **evolutionary vision** for the chemical industry in Italy has been identified in the study



*"Fostering the development of an **integrated and increasingly circular supply chain approach** to **strengthen** the role of the chemical industry **as an enabling competence** in Italy, supporting its green transition in line with the **principle of technological neutrality**, and creating a **more competitive and attractive** system that fosters **business and employment growth**"*

The vision for the green transition of the chemical industry is based on a few key principles:

- Recognition of the role of the chemical industry as an **enabling factor** for *Made in Italy* and the sustainable development of the country
- Public facilitation to support the **large investments** needed for the transition of the chemical industry and removal of regulatory enforcement uncertainties
- **Stable and consistent regulatory framework** (European and Italian), guided by the principle of **technological neutrality** and attentive to **industrial competitiveness**

- A relationship of mutual **collaboration between the P.A. and business firms** that, while fully respecting their roles, increases efficiency in authorization and control processes by reducing application uncertainties and avoiding additional regulatory burdens compared to what is provided by the European regulatory framework
- Availability of **energy** (from renewable and fossil sources) at competitive costs and adequate infrastructure
- Public instruments to stimulate **vocations** in the chemical disciplines, to activate and enhance **training programs** directed at the acquisition of appropriate skills by the **current workforce** and **young people** about to enter it, to address **generational change** and **employment dynamics**

THE 5 PRIORITY AREAS FOR INDUSTRIAL POLICY ACTION

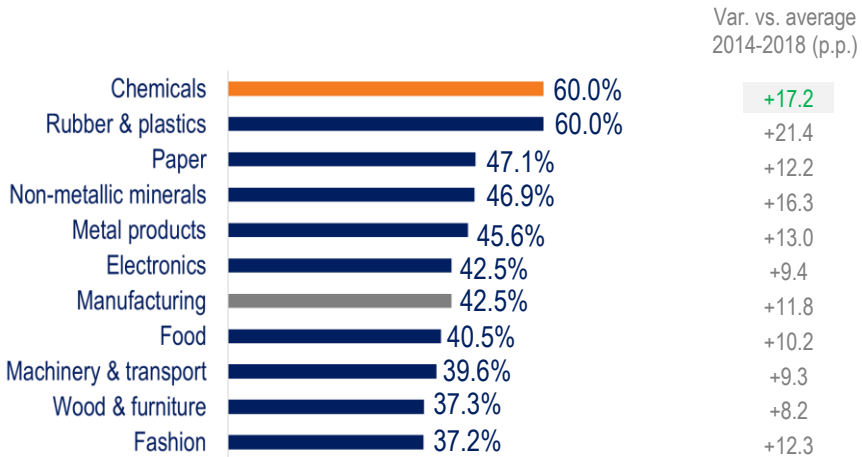
FOREWORD

Five priority areas have been identified and, for each, **proposals for action** have been identified, reclassified into 'portfolio' proposals (i.e. requiring public allocations) and '*quick-win*' proposals (i.e. not requiring public allocations)

The **purpose** of this differentiation is to highlight, on the one hand, the presence of **immediately adoptable** actions that do not require an economic 'effort' but can help enable the ecological transition of the chemical industry in Italy and, on the other hand, the **need to plan ad hoc investments for the chemical industry from a long-term perspective**

1. INVESTMENTS AND FUNDING

Chemicals ranks 1st among manufacturing sectors for companies investing in environmentally sustainable products and technologies



Share of companies investing in eco-sustainable products and technologies (% of total), average 2017-2021.
 Source: elaboration by The European House - Ambrosetti on data from the Greenitaly Report, 2024.

The green transition of the chemical industry requires:

- **Investments in breakthrough technologies:** chemical recycling, renewables and biotechnology, renewable hydrogen and electrochemistry, CO₂ recovery and reuse
- **Investments in domains of continued innovation** in four priority areas: energy efficiency and procurement, product eco-design, environmental sustainability and digitalization

PROPOSALS

- Set up a **'Fund for Circular and Sustainable Chemistry'** at the Italian Ministry of Enterprises and *Made in Italy*, which would also act as a **'single platform' for financing for companies** in the chemical industry in Italy, also allowing SMEs to access financing more easily, even for small investments
- Provide **continuous and easily accessible incentives** with a Transition 5.0 perspective for sustainable innovation projects
- Provide a **threefold level of support** for companies engaged in *breakthrough* technologies:
 - Provide regulations favourable to their development, such as the ***mass balance approach and allocation***, to make alternative feedstocks such as pyrolysis oil from chemical recycling and biomass available
 - Facilitate technology adoption through regulatory streamlining interventions with 'preferential pathways' for **project evaluation**, simplified **authorization processes** and the **necessary certifications for their exploitation**
 - **Make the operation of different technologies competitive** by creating incentive mechanisms necessary to stimulate market demand

Legend of proposals: in light blue, proposals 'with portfolio' (requiring public allocations) and in blue, 'quick-win' proposals (not requiring public allocations).

2. REGULATORY SYSTEM

The chemical industry today is impacted by a **'regulatory tsunami'** as it is the sector affected by the largest number of legislative initiatives related to the European Green Deal

The **main regulatory areas** are energy and climate neutrality, circularity, product safety and labelling, plant safety, freight transport, and sustainable finance

The **main cross-cutting challenges** include adequate attention to industrial competitiveness, application of the principle of technology neutrality and shared, science-based methodologies, overcoming internal inconsistencies in the regulatory system and the slowness and uncertainty of permitting processes



The **principle of 'technology neutrality'** is a regulatory approach that looks at the complementarity of all technological solutions to ensure **efficiency in applications** and encourage the **renewal of the existing industrial structure**

Any **restrictions on the use of substances** should also consider the capacity for **effective risk management**, the multitude and relevance of **uses**, and the availability of **viable alternatives**

Effective controls are also needed on substances and articles **imported** from outside the EU

PROPOSALS

- Advocate positions at the EU level aimed at **combining environmental and socio-economic objectives**
- **Simplify and make the Italian regulatory framework consistent with that of the EU**, avoiding **additional restrictions** with respect to European legislation - particularly on waste and the circular economy - and defining **guidelines** on the interpretation and application of regulations
- Adopt **time-certain** authorization and control procedures based on the **collaborative relationship between P.A. and enterprises**
- Provide for an **adequate supply of specialized technical personnel** at the Competent Authorities
- Provide for **more targeted and efficient control mechanisms** (e.g. by fostering **greater knowledge** on the part of the public administration and/or the Authorities in charge of controls, introducing **reward mechanisms** for virtuous companies, taking into account the **outcomes of previous verifications**, particularly in the case of alternating controllers)

Legend of proposals: in **light blue**, proposals 'with portfolio' (requiring public allocations) and in **blue**, 'quick-win' proposals (not requiring public allocations).

3. ENERGY COSTS

- Chemistry is a **hard-to-abate** sector in both organic chemistry (as a transformer of fossil energy carriers such as oil and natural gas) and inorganic chemistry due to the high incidence of energy required for the process
- The chemical industry is, in fact, the **2nd** largest sector by final energy consumption in Italy with 44.6 GWh consumed annually (**16%** of total manufacturing)



- The chemical industry **also** uses fossil fuels **as raw materials**, with **costs as a percentage of revenues exceeding 14% even before the energy crisis**: 9.9% for energy raw materials and 4.3% for energy
- **Replacement of fossil fuels** is not fully feasible today based on currently available technologies
- In Italy, the cost of gas and electricity remains at much higher levels than its non-EU competitors and is also suffering from a historical extra-cost even compared to the EU, which peaked in 2022

PROPOSALS

- Enhance Italy's role as an energy hub for Southern Europe – for gas, CO₂ storage and renewables - in a strategy that includes next-generation nuclear and fusion power
- Renew and enhance **support schemes for cogeneration plants**
- Earmark **resources from the proceeds of ETS allowance auctions to offset indirect costs on the electricity price** (up to the maximum limit of 70% allowed by EU regulations, as is the case in other EU countries) **and to finance industrial emission reduction projects;**
- Rapidly implement **gas and electricity release at competitive prices**
- Make the **White Certificates mechanism** available **also for SME efficiency projects**

Note: The last intervention - although it can be considered as a proposal 'with portfolio' as it requires public allocations - is more limited in scope and can be considered '*quick-win*'.

Legend of proposals: in **light blue**, **proposals 'with portfolio' (requiring public allocations)** and in **blue**, **'quick-win' proposals (not requiring public allocations)**.

4. INFRASTRUCTURE AND LOGISTICS

Critical issues related to the logistics system 'cost' the chemical industry in Italy **9% of turnover annually**, amounting to **5.4 billion euros**

Due to the country's infrastructural inefficiencies, the cost of logistics in Italy is more than **25% higher** than in other major EU countries



The potential savings achievable in the event of alignment with the EU average is **1.4 billion euros annually**

PROPOSALS

- Increase the **sustainability of transport** related to the chemical industry by investing in **rail and multimodal transport**
- Implement infrastructure (road and rail) in Southern Italy to foster intermodality and the creation of an energy hub
- Improve **logistics management of hazardous goods and waste** by increasing availability and encouraging the creation of **multimodal hubs** that are close to industrial clusters
- Develop a **regulatory framework for the transportation of waste** obtained as scraps from chemical processes and waste that can be reused as 'secondary raw material' by the chemical industry

Legend of proposals: in **light blue**, proposals 'with portfolio' (requiring public allocations) and in **blue**, 'quick-win' proposals (not requiring public allocations).

5. SKILLS AND SOCIAL DIMENSION

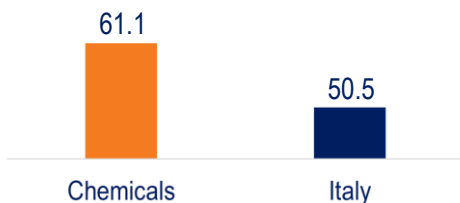
The chemical industry in Italy ranks **1st** in terms of the percentage of companies conducting **personnel training (67.2%)**



However

In 2022, more than 1/3 (**35%**) of the planned hires were **'hard to find'**, especially in the area of **green transition and environmental sustainability (56.7%)**

DIGITAL SKILLS



GREEN SKILLS



Percentage of hard-to-find recruitments requiring digital (left) and green (right) skills, percentage values out of total, 2022. Source: elaboration by The European House - Ambrosetti on data from Unioncamere - ANPAL, Excelsior Information System, 2024.

PROPOSALS

- Encourage **the acquisition of skills suitable** for the needs of industry, promoting **public training plans/programmes** on the basis of new needs and stimulating, also through **tax breaks**, objectives to improve skills related to digital and green transformations
- Activate tools to manage **generational turnover and employment dynamics**

Enhance the relationship between chemical companies and the world of education (especially 'ITS' Academies – Higher Technological Institutes)

- Promote **vocations** in chemical disciplines at all levels (university and technical education)
- Promote **teacher training** also for primary and secondary schools
- Facilitate and encourage a **structured relationship between companies and training institutions**
- Strengthen the in-depth study of **regulatory, technological, industrial aspects** in university courses

Legend of proposals: in **light blue**, proposals 'with portfolio' (requiring public allocations) and in **blue**, 'quick-win' proposals (not requiring public allocations).

**«WHAT-IF»
SCENARIOS**

The 'what-if' analysis **does not represent a forecast** on the performance of the chemical industry in Italy, but rather a **hypothetical projection based on the investments needed to enable the green transition of the chemical industry in Italy, the activation of which requires the full realization of the conditions analyzed in the previous points.**

The analysis is based on the current relationship between production factors. Therefore, **any changes related to the basic structure of the chemical industry** in Italy and related econometric indicators and economic-financial ratios (e.g. revenue and cost structures, redirection to certain product types, etc.) are not taken into consideration.

Investment benefits

CHEMICAL INDUSTRY

+ €22.2 billion in incremental value added in the **chemical industry in Italy** that could enable **employment growth** in the sector of up to **>19,000 new jobs**

MANUFACTURING

+ €33.3 billion in incremental value added (a growth rate of **+13%**, **20%** higher than that experienced in 2013-2022)

ECONOMIC SYSTEM

Up to **56,000 new jobs** could be generated **throughout the economy**

Risks of 'total inaction'

MANUFACTURING

Italian manufacturing value added could fall by **€42bn** (-16,3%)

The Italian manufacturing system would return to 2000 levels (€215bn), **losing more than 20 years of growth**

