

May 2023. Sector snapshot

The chemical industry in Catalonia

The chemical industry in Catalonia, sector snapshot

ACCIÓ
Government of Catalonia



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Carried out by

Strategy and Competitive Intelligence Unit of ACCIÓ

Barcelona, May 2023

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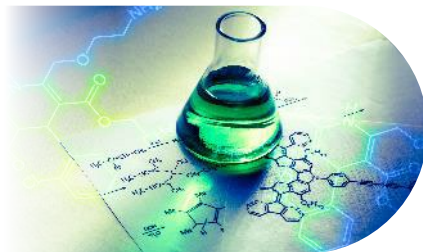
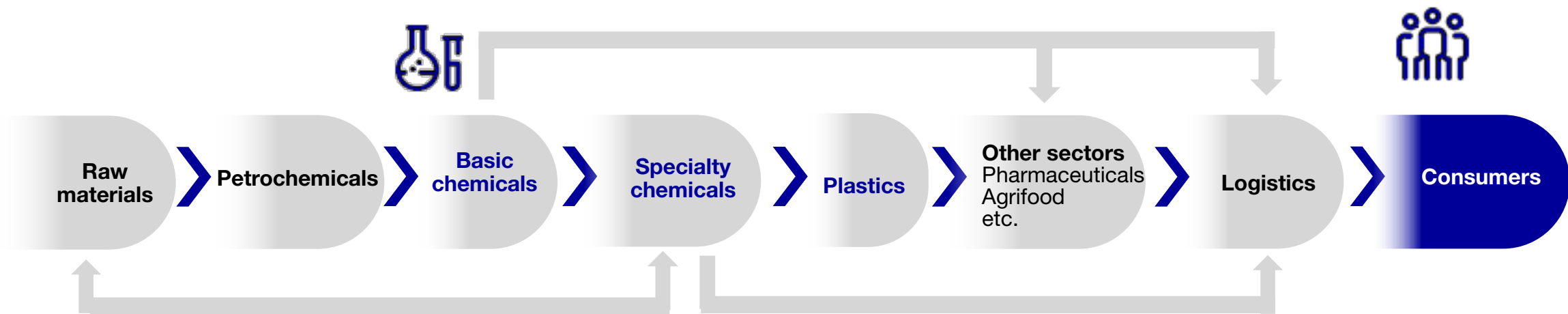


3. Trends and challenges in the chemical industry

1. The chemical industry in the world



Chemical industry value chain



Note: the segments included in the study are indicated in blue.

Source: ACCIÓ

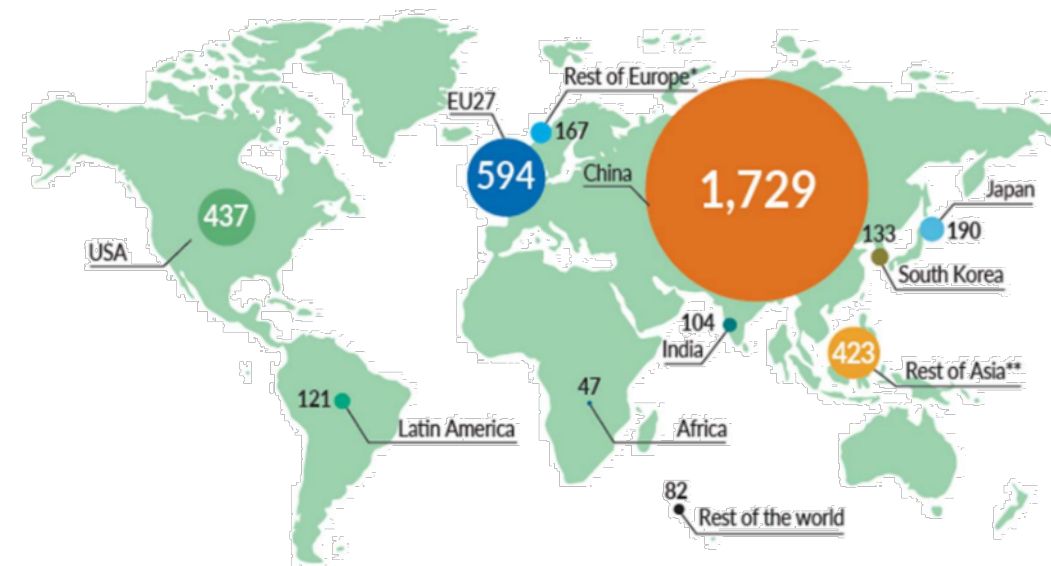
The chemical industry in the world

- **Global sales** of chemicals were valued at **€4,026 billion** in 2021.
- **China is the world's leading producer**, providing **43% of the global sale** of chemical products in 2021. With 14.8%, the EU chemical industry ranks second, and the United States ranks third with 10.8% of total sales.
- **Germany (29%)** and **France (17%)** are the two largest producers of chemical products in Europe, followed by **Italy (10%)**, the **Netherlands (10%)**, **Spain (8%)**, and **Belgium (7%)**. Together they represent **81%** of the total EU sales.

Main chemical and plastics companies in the world



Global sales of chemical products: Breakdown by region, 2021 (in billions of €)



Source: Cefic. 'The European Chemical industry Facts and Figures 2023'. Cefic considers the following to be chemical products: Consumer chemicals, petrochemicals, basic inorganics, specialty chemicals, and polymers. ACCIÓ based on data from Orbis and C&EN.

Sustainable development goals in the chemical industry



Chemicals play an essential role in helping society achieve its **Sustainable Development Goals (SDG)**. The chemical industry is diverse and complex, and as such interacts with a large number of SDGs.

Opportunities for new chemical research, green and sustainable chemistry education, green and sustainable chemical manufacturing practices, and a sense of social responsibility are crucial for the chemical industry of today and tomorrow.

Source: ACCIÓ based on the International Telecommunication Union (ITU), the specialized agency of the United Nations (UN) responsible for information and communication technologies (ICT)

The chemical industry in Catalonia



Catalonia, a smart choice for chemical companies that want to expand their business

Chemical production centers and regional clustering

- **Catalonia is the top region of Spain** in the number of companies, revenue, and jobs.
- **2nd largest manufacturing sector in the Catalan economy** by revenue, behind food.
- **Three different chemical hubs** in Catalonia (Barcelona, Tarragona and Vallès) featuring companies in the chemical industry at different levels of the value chain, in addition to those offering services to chemical companies.

Ecosystem

- Catalonia has a first-class ecosystem for chemical companies.
- Solid **public-private collaboration** in support of the Catalan chemical ecosystem.
- Presence of **ChemMed, an industrial chemical**, logistic, academic, and scientific cluster in Tarragona made up of more than a hundred chemical companies.

High-tech ready

- Renowned applied and basic **research groups** that support technological transfer and a comprehensive network of scientific and technological centers representative of the **research and innovation** program of Catalonia.

Excellent logistics infrastructure

- A logistics network that provides service to **400 million** consumers in Europe - Mediterranean - Africa in less than 48 hours.
- The **Port of Barcelona** and the **Port of Tarragona** have **of excellent multimodal distribution facilities for the chemical industry**.
The **Port of Tarragona** is the logistics platform in charge of importing the raw materials needed for the production processes of the chemical industry and exporting the products derived from them. **It is the largest petrochemical cluster in southern Europe.**

Chemical industry leaders choose Catalonia

- Catalonia is the **5th** ranked region of the European Union in job creation, the **9th** in number of projects and the **14th** in capital investment (2018 to 2022).
- Companies such as AkzoNobel, Croda, and Essity have their Digital Innovation Hubs in Catalonia.

Top export sector in Catalonia

- Catalonia is the **region with the largest number of exports** in the sector. **41% of exports** from the chemical and plastics industry over the last five years have been sent from Catalonia.
- The chemical and plastics industry in the last five years represents **20% of the total exports** from Catalonia.

Source: ACCIÓ

The chemical industry in Catalonia, leader in Spain in the number of companies, revenue and jobs

1,985 companies (2022, DIRCE 2022)



- Catalonia is the most important region in Spain with 25.7% of its chemical companies.
- 85.0% of the companies were established more than 10 years ago.
- 58.7% of the companies are exporters and 44.2% are regular exporters.
- 11.8% are foreign subsidiaries.

61,560 employees (2020)



- **31.1%** of employees of the sector in Spain
- **12.7%** of employees in Catalan industry
- **2nd** ranked manufacturing sector in Catalonia in direct employment.
- 93.1% work in companies with over 10 years in existence.
- 69.9% work in micro or small businesses (fewer than 50 employees).

€21,596 billion in revenue (2020)



- **36.8%** of the revenue of Spain, leading the country.
- **2nd** largest manufacturing sector in the Catalan economy.
- It represents 12.4% of the total GDP of Catalonia and **16.5%** of Catalan industrial revenue.
- 87.8% of its revenue comes from large and mid-sized companies.

Economic contribution and territorial distribution

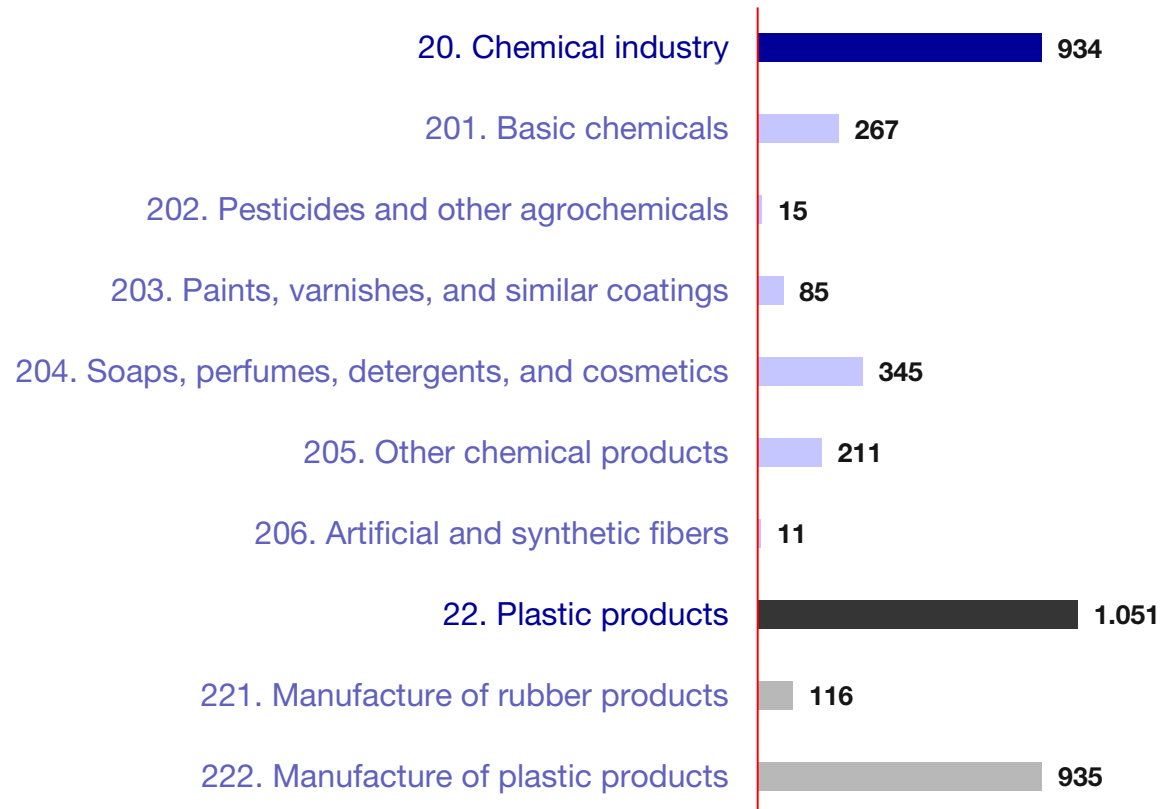


- The three major chemical hubs of Catalonia (Tarragona, Barcelona, Vallès) together amount to 80% of the industry's companies, 87% of its revenue, and 81% of its jobs.
- Vallès Occidental, Barcelonès, Baix Llobregat, Vallès Oriental, and Maresme are the counties with the most companies related to the chemical industry.

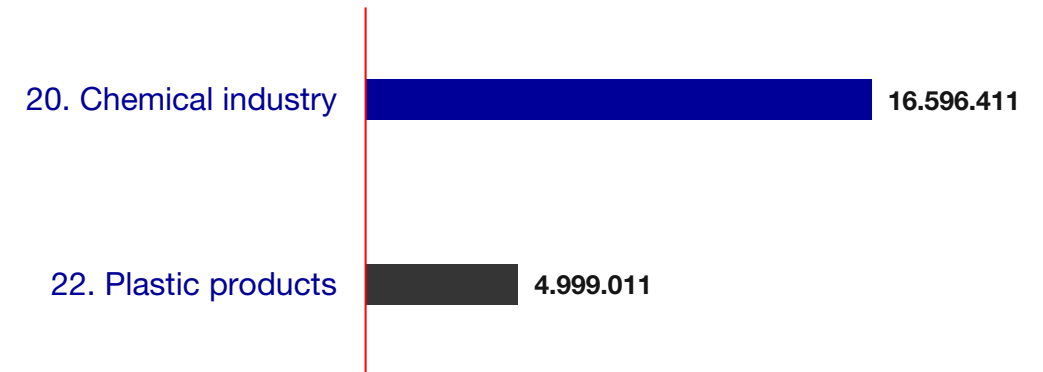
Source: ACCIÓ from INE and Orbis (CNAES 20 and 22)

Quantification of the different areas of the chemical industry and characterization of the different segments

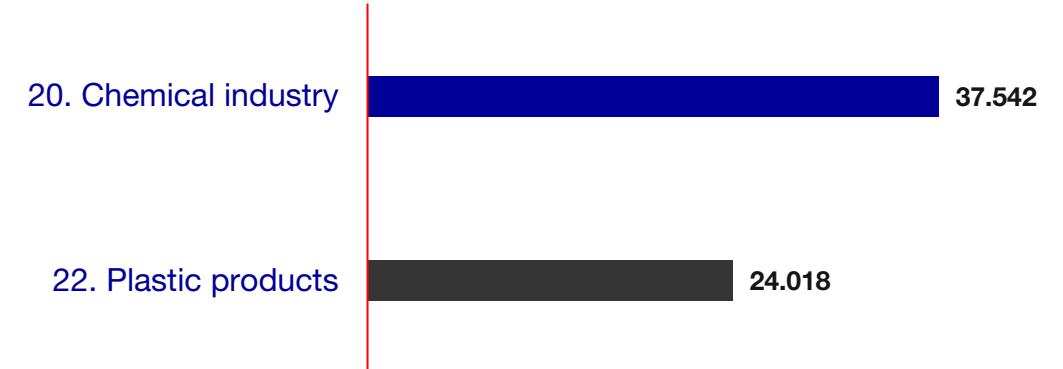
Companies in the industry (2022, DIRCE)



Revenue (2020, INE)



Employees (2020, INE)



Source: ACCIÓ, based on INE

Chemical industry value chain in Catalonia



Source: ACCIÓ based on Orbis. Partial non-exhaustive profile of companies with high revenue in each segment.

Three major chemical companies account for 87% of the chemical industry revenue in Catalonia

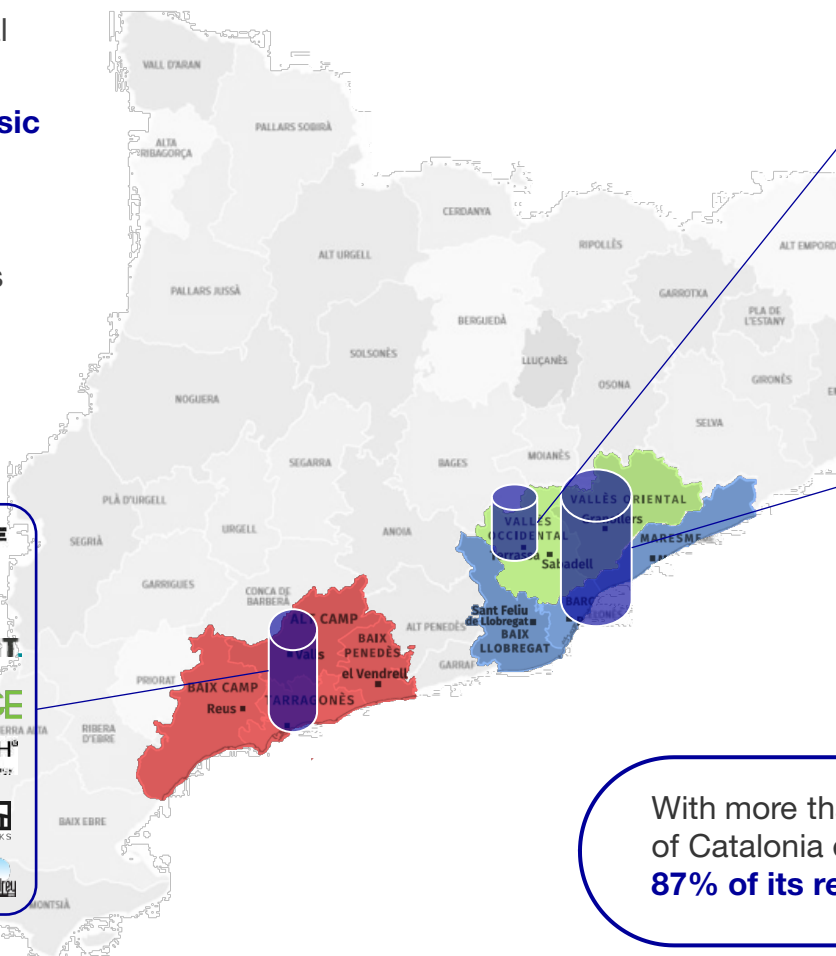
In Catalonia there are three major chemical hubs which are dedicated to different areas of the chemical industry and offer services to chemical companies.

Tarragona is mainly engaged in the production of **basic** chemical products, petrochemicals, and polymers; **Vallès** focuses on the production of **specialized** chemical products, detergents, paints, and fertilizers; and **Barcelona**, in addition to being the headquarters and the **site of sales offices**, we find **intermediate** chemical production plants, cosmetics, personal hygiene, and pharmaceuticals.

Tarragona Chemical Hub

Vallès Chemical Hub

Barcelona Chemical Hub



With more than **1,500 companies**, the three chemical hubs of Catalonia encompass **80% of the sector's companies**, **87% of its revenue**, and **81% of its jobs**.

Source: ACCIÓ based on Orbis. Partial non-exhaustive profile of companies with high revenue in each hub.

Some relevant companies in the sector

Chemical industry

BASF



BASF is the largest chemical company in the world and has a wide range of products ranging from chemicals and plastics to solutions for agriculture.

Puig



Puig is a third-generation family business dedicated to fashion, cosmetics, and fragrances.

AkzoNobel



AkzoNobel is the leading international company in paints and coatings and a major producer of specialty chemicals.

Bayer



Bayer is a multinational company with key competencies in the field of science applied to health and food.

Dow



Dow is a multinational company that manufactures plastics, chemicals, and agrochemicals.

Plastics sector

Gates



Gates is the leading power transmission belt company and a manufacturer of hydraulic power products.

Ammega



Ammega is a champion in power transmission, lightweight conveyors and process belts, and fluid power.

SMP Automotive



SMP is one of the leading experts in high quality interior and exterior modules for the automotive industry.

ELIX Polymers



ELIX Polymers is one of the leading manufacturers of ABS resins (acrylonitrile butadiene styrene) and derivatives in Europe.

TATAY



TATAY is a company that produces and distributes plastics.

Note: description based on the websites of these companies

Source: ACCIÓ

CataloniaConnects

Barcelona has more than 2,000 startups in 2022

Catalan startup ecosystem

2,022
companies

€1.720 billion
in revenue

19,138
people employed

Startups related to the chemical industry

Astrea
materials

Azolla Projects
Carbon Farming Program

distinkt

FWN

INDRESMAT
Catalan Institute for Research and Innovation in Materials

JOLT

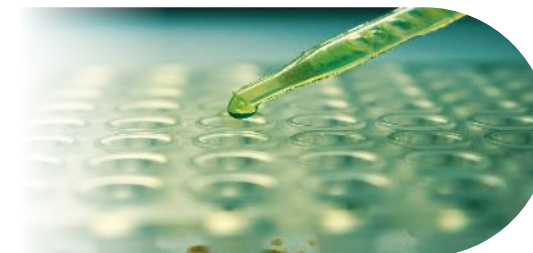
CARBÓN
VIVO

nzero
ZERO ORGANIC HYDROGEN

BAULA*
The in chemistry world

Minerales tecnológicos
expandidos S.L.

nözama

Source: ACCIÓ, based on the "Barcelona & Catalonia Startup Hub, 2022" report

The chemical industry ecosystem in Catalonia

Business associations related with the chemical industry



Clusters



Universities with programs involving the chemical industry



Tradeshows in Catalonia

Plastics



Chemicals



Cross-sectoral fairs



Source: ACCIÓ. Sample of the main representatives of each category.

ChemMed Tarragona, the Mediterranean chemical cluster

To the south of Barcelona, there is a leading chemical hub located in Tarragona that brings together a wide range of competitive companies, as well as cutting-edge infrastructures and the Port of Tarragona.

The **Tarragona Chemical Hub (ChemMed)** is a solid platform that facilitates the import and export of chemical materials to the **Mediterranean and North Africa**, and concentrates partners and potential suppliers of the chemical, energy and resource business.



More than a hundred chemical companies of all sizes:

Manufacturers and service companies. Production includes petrochemicals, polyolefins, plastics, organic chemicals and industrial products, as well as specialty chemicals and fine chemicals, thus representing the classic value creation chain.

Grouped infrastructures and services:

Two Combined Cycle Power Plants with a total of 820 MW of power for the supply of electricity, steam, nitrogen, hydrogen, compressed air and demineralized water to the companies in the cluster.

Supply of regenerated water. A source of supply that reaches up to 20 hm³/year.

Pooled underwater wastewater outlet pipe.

Three grouped fire stations.

Technological and Chemical Research Centers

Catalan Chemical Research Institute (ICIQ)
Chemical Technology Center (CTQC)

Academia

Southern Catalonia Campus of International Excellence (CEICS)
Rovira i Virgili University (URV)
Professional Training Centers



Associated chemical companies



Source: ChemMed webpage

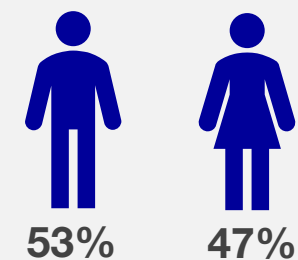
Talent

Students enrolled in Masters and undergraduate degrees related to the chemical industry in the 2021-2022 academic year.

Of the total number of students enrolled in Spain in Masters and undergraduate degrees related to the chemical industry, around **17%** study in Catalonia (5,616 students).



By gender, the distribution of **students in Catalonia** is very close to parity:



Of the total of **people enrolled in Spain** in Masters and undergraduate degrees related to the chemical industry, **53%** are women.

Source: ACCIÓ

High-tech ready

Well-known applied and basic research groups that support technology transfer and a complete network of scientific and technological centers form the basis of Catalonia's research and innovation program.



Catalan Institute of Chemical Research (ICIQ): carries out pioneering research on catalysis and renewable energies.



Automotive testing facility of the **IDIADA**.



ALBA synchrotron, the largest particle accelerator in southern Europe.

ALBA II project: a program that will transform ALBA into a 4th generation synchrotron with the overhaul of its accelerator and instrumentation and the construction of new beam lines.



The **Institute of Photonic Sciences**, one of the top research institutions in the world.



Biomedical Research Park, leader in southern Europe in biomedical research.



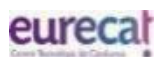
Mare Nostrum (BSC), 3rd largest supercomputer in Southern Europe.

Technology within reach of companies

Technology centers related to the chemical industry

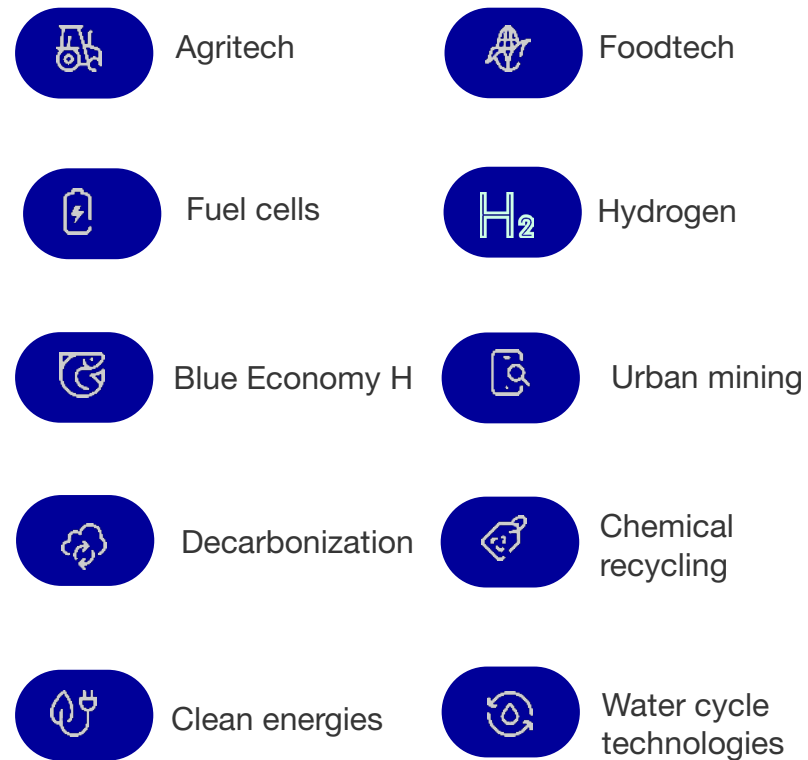


Technology centers and research groups related to the chemical industry

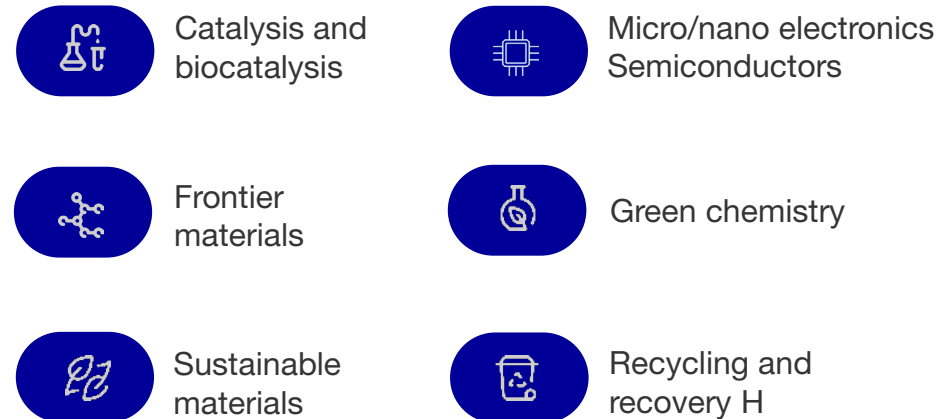


Technology trends and innovations applied to chemistry

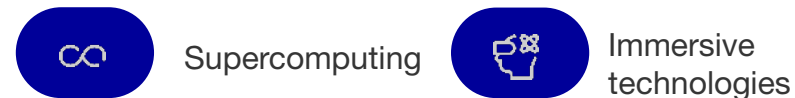
Technology trends of the green transformation



Industrial technology trends



Digital technology trends



Source: ACCIÓ

Cases of technology applications in chemistry in Catalonia

Micro/nano electronics



Nanotechnology and printing electronics based on graphene printing makes it possible to apply its properties to any material from printing membranes and convert graphene into chemical sensors, among others.

Chemical recycling



Biotech startup dedicated to the transformation of organic waste into Polyhydroxyalkanoate bioplastics that are characterized by being produced by bacteria, biodegradable in the environment and compatible with the human body.

Fuel cells



Company that created a graphene-lithium hybrid battery for electric bicycles and motorcycles that can be charged in five minutes. These batteries can be charged up to 12 times faster than other traditional types.

Supercomputing



Develops simulation and data analysis tools to accelerate the design of new chemicals by characterizing molecular behavior, predicting performance and identifying the best candidates to meet the physicochemical characteristics before synthesizing molecules.

Chemical recycling



Its Orchestra Sci technologies enable the separation and purification of CO₂ at low pressure, reducing the amount of investment required. They are suitable for multiple applications where CO₂ is needed as a product or additive, applying small emission foci.

Frontier materials



Provides unique technology on a global scale used by NASA and NASCAR. It has developed a catalyst based on gold nanoparticles that is able to eliminate toxic pollutants at room temperature and in the presence of humidity and thus preserve air quality.

Water cycle technologies



Adiquímica is a company that manufactures chemical products that offers advanced water treatment solutions with the aim of comprehensively and sustainably meeting all the water quality and treatment needs facilities require.

Sustainable materials



This company has created an innovative process capable of converting the racket strings used in tournaments into 100% recycled polyester with the aim of producing sports gear. The technology developed makes it possible to reduce the amount of water, energy and CO₂ emissions.

Recycling and recovery H



It has developed an eco-friendly solution to replace conventional heating and cooling systems based on vapor compression that use toxic gases for processing systems using a natural rubber-based composite.

Source: ACCIÓ

Catalonia, intermodal logistics hub

Catalonia is home to **two of the main ports of the Mediterranean**, several high-speed train stations, several airports (Barcelona's internationally awarded airport) and motorways perfectly connected to the rest of the Spanish and European road system.



Port de Barcelona

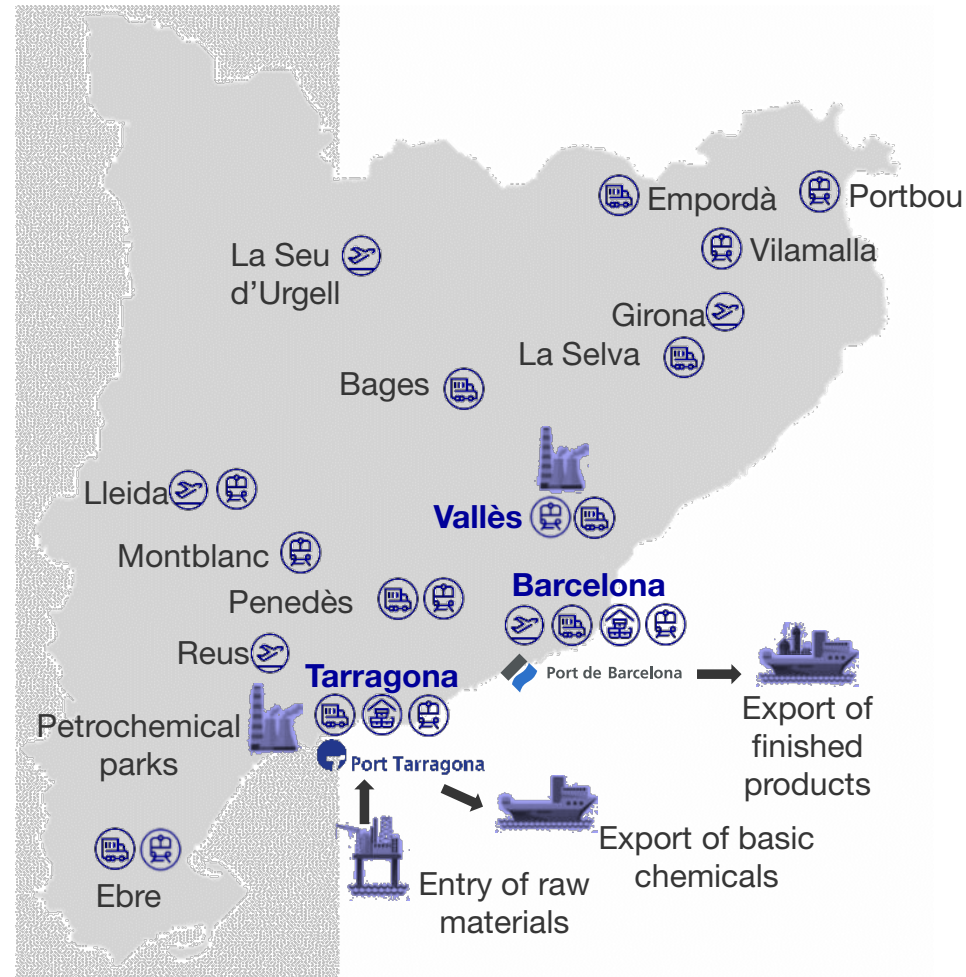
- The largest range of logistics and transport services in Spain and southern Europe. 65 million tons just in the transit of goods to Barcelona.

Industrial and large-scale distribution specialization in established and emerging sectors (pharmaceutical, chemical, mobility, agri-food, e-commerce, large-scale distribution, fashion and automotive).



Port Tarragona

- 67.8% of the Port of Tarragona's business comes from the petrochemical sector.
- The area in the port of Tarragona dedicated to chemicals has doubled, now amounting to 36 hectares for the deployment of storage tanks.



Railroad hub



Logistics center



Airport



Road transport hub

An extensive railway and road infrastructure network.

Catalonia is the main European region in terms of **road infrastructures** containing four or more lanes (48.7 km/1000 km²); the top Spanish region in the volume of both interregional and international transport of goods by road.

An extensive **railway network** connects Catalonia with the rest of Spain and France, including 400 km of high-speed rail. The Mediterranean Corridor is a dual high-speed railway that runs throughout Catalonia; connecting European countries as far as Hungary.

Source: ACCIÓ

Chemical industry leaders choose Catalonia (I)

From 2018 to 2022

- **32 companies** have materialized **39 chemical FDI projects** in **Catalonia**. These projects amount to a **capital investment of €654 million**. During the period, a total of **1,262 jobs** were created.
- Germany is the main chemical investor in Catalonia, followed by the United States and France.

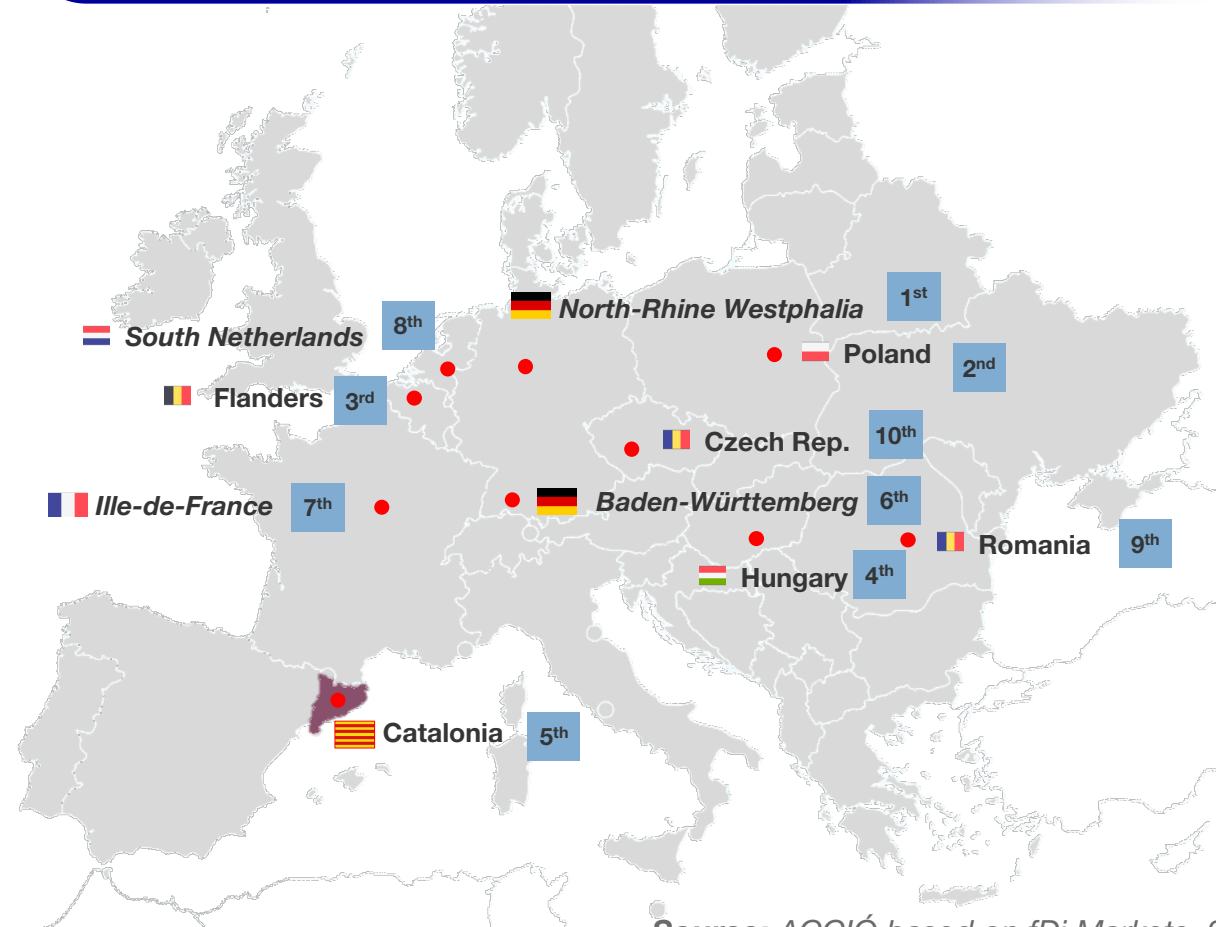
Digital Innovation hubs



CRODA



Top 10 regions receiving chemical FDI in the EU27 by number of projects (2018-2022)



Source: ACCIÓ based on fDi Markets, 2018-2022

Chemical industry leaders choose Catalonia (II)

Dow Chemical



Dow Chemical, a US-based chemical company, has announced plans to increase the capacity of its manufacturing facility in the Canonja area of Tarragona, Catalonia. The company will also invest in safety improvements and energy efficiency.

€53 mln

46 jobs

BASF



BASF, a chemical company based in Germany, has announced plans to increase the capacity of its manufacturing facility in the Canonja area of Tarragona, Catalonia. The company will also invest in safety improvements and energy efficiency.

€53 mln

46 jobs

Messer Group



Messer Group, based in Germany and specialized in industrial gases, will build a new production plant at its plant in Vila-Seca, Spain. It will have a capacity for 2,400 tons of oxygen, nitrogen, and argon per day. The new \$41.1 million plant will create 20 jobs and is scheduled to begin operations in December 2021. It will serve the local market and lay the foundations for further growth in Western Europe.

€38 mln

20 jobs

BASF SONATRACH



BASF SONATRACH, a propylene producer and a subsidiary of a joint venture with the German chemical company BASF, invested €33 million to increase the capacity of its manufacturing facility in the Canonja area of Tarragona, Catalonia. The company carried out a project to eliminate bottle necks in the production process, which will increase the plant's annual capacity from 370,000 to 420,000 tons. The expansion is part of BASF's larger plans to invest €59.5 million.

€33 mln

29 jobs

The chemical industry, the leading exporter in the Catalan economy

During the last decade, 42% of Spanish exports in the chemical industry have come from Catalonia.

- In the five-year period from 2018 to 2022, Catalan chemical exports experienced **32% growth** and **54%** over the last 10 years.
- **Catalonia is the region with the most regular exporters of chemical products:** in 2022, regular exporters accounted for **44%** of the total of companies exporting chemical products in Catalonia (and **39%** of the total of regular chemical exporting companies in Spain).
- Plastics in primary forms, basic organic chemical products, dyes and pigments, and nitrogen fertilizers and compounds were the most exported products in 2022.

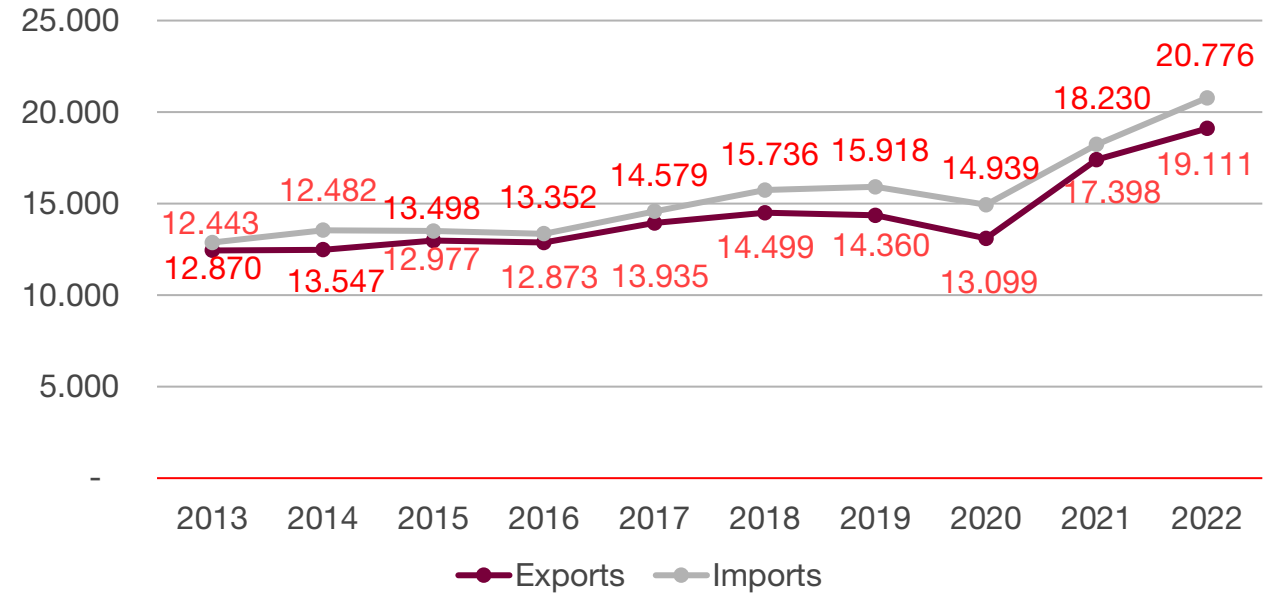
- Top 5 countries where Catalonia **exports**:



- Top 5 countries from which Catalonia **imports**:



Evolution of imports and exports in Catalonia over the last 10 years
(€ billion)



€78.467 billion in exports 2018-22
41% of the total of Spain

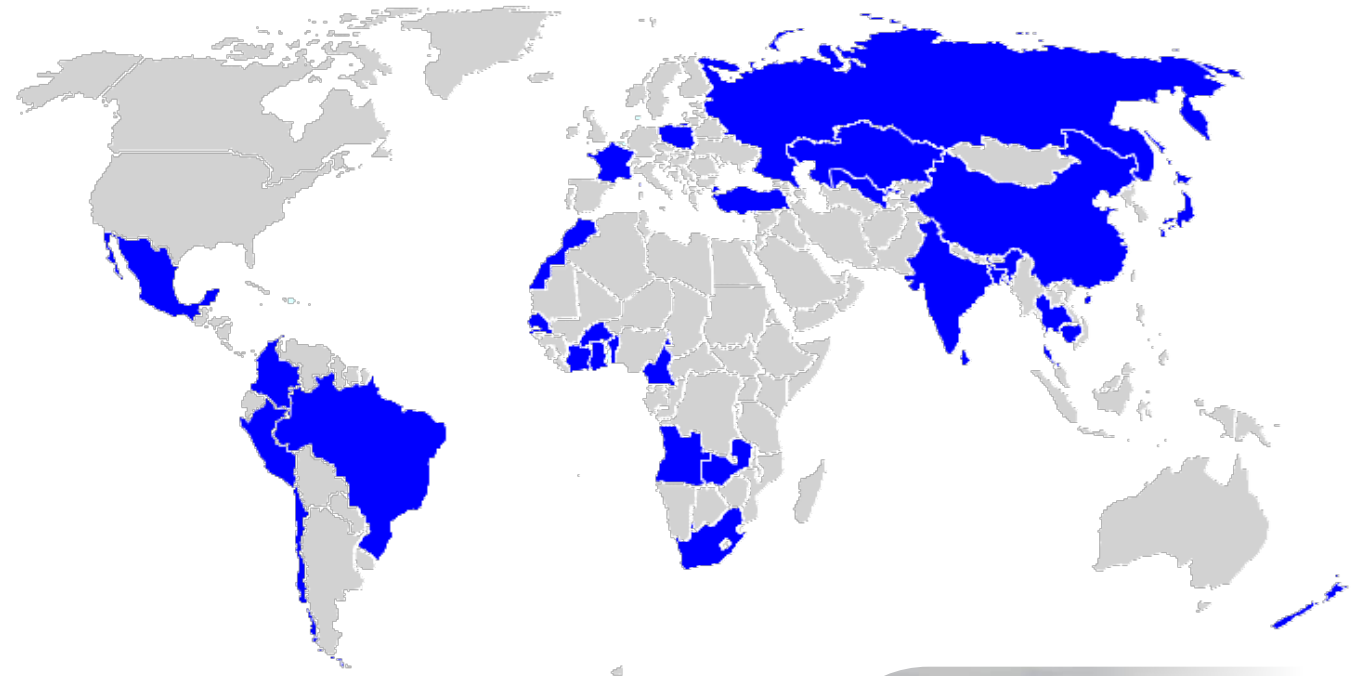
€85.698 billion in imports 2018-22
40% of the total of Spain

Source: ICEX

International business opportunities in the chemical and plastics industry

- The Global Map of International Business Opportunities 2022 detects a total of **35 opportunities** in this industry.
- The opportunities in plastics (**10 opportunities**) and cosmetics (**10 opportunities**) stand out.
- Many opportunities related to water, paint, and chemicals for the industrial sector are detected.
- **Recommender** of international business opportunities.

Regional distribution of opportunities



Source: ACCIÓ from the 2022 Global Map of International Business Opportunities.

3. Trends and challenges in the chemical industry



Trends in the chemical industry



Decarbonization of the economy



Sustainability



International competitiveness



Digitization and efficiency



Talent and social dialog



Legal and regulatory framework



Better perception of the industry in society

Thank you

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 @accio_cat

 @catalonia_ti

More information about the sector, news and opportunities:

<https://catalonia.com/key-industries-technologies/chemical-plastics-green-business>

