1. Profile - key figures
Europe is the second-largest chemicals producer in the world

World chemicals sales (2021, €4,026 billion)
China dominates chemical sales globally

**Chemical sales by country: top 10**

- **China**: $1,729 billion
- **EU27**: $594 billion
- **USA**: $437 billion
- **Japan**: $190 billion
- **South Korea**: $133 billion
- **India**: $104 billion
- **Brazil**: $77 billion
- **Taiwan**: $76 billion
- **Russia**: $58 billion
- **Saudi Arabia**: $58 billion

Source: Cefic Chemdata International
EU27 market share dropped significantly

World chemical sales by country: top 10

- USA: 15%
- EU27: 19%
- Japan: 6%
- Brazil: 5%
- Taiwan: 3%
- South Korea: 4%
- India: 3%
- Russia: 1%
- Saudi Arabia: 1%
- China: 43%

Source: Cefic Chemdata International

World chemical sales 2011 (€2,720 billion) vs. World chemical sales 2021 (€4,026 billion)
World market share of EU27 chemical sales drops substantially

**EU27 share of global chemicals market**

![Graph showing EU27 chemical sales and world share over time](source: Cefic Chemdata International)
Petrochemicals account for more than ¼ of EU27 chemicals sales

EU27 chemical sales 2021 (€594 billion)

- Petrochemicals 26%
- Specialty chemicals 28%
  - Auxiliaries for industry 16%
  - Paints & inks 8%
  - Crop protection 2%
  - Dyes & pigments 2%
- Polymers 20%
  - Plastics 18%
  - Synthetic rubber 1%
  - Man-made fibres 1%
- Consumer chemicals 14%
- Basic inorganics 13%
  - Other inorganics 5%
  - Industrial gases 3%
  - Fertilizers 5%

Source: Cefic Chemdata International
Two thirds of EU27 chemical sales generated in four Member States

EU27 chemical sales broken down by country (2021)

Source: Cefic Chemdata International

- DE 29%
- FR 17%
- IT 10%
- NL 10%
- ES 8%
- BE 7%
- Others 16%
- AT 3%
EU27 chemicals sales increased significantly in 2021

EU27 chemical sales structure (€ billion)

Source: Cefic Chemdata International
One third of EU27 chemicals sales is generated from exports

EU27 chemical sales structure (%)

- **2011**
  - EU27 home sales: 29%
  - Intra-EU27 sales: 26%
  - EU27 foreign sales: 45%
  - Total: €506 billion

- **2021**
  - EU27 home sales: 34%
  - Intra-EU27 sales: 8%
  - EU27 foreign sales: 58%
  - Total: €594 billion
More than half of EU chemicals are supplied to the industry.

Customer sectors of the EU27+UK chemical industry (2017)

- Agriculture, hunting, forestry and fishing: 8%
- Health and social work: 17%
- Other: 19%
- Rubber and plastics products: 16%
- Construction: 5%
- Pulp, paper, paper products, printing and publishing: 4%
- Coke, refined petroleum products and nuclear fuel: 4%
- Textiles, textile products, leather and footwear: 4%
- Food products, beverages and tobacco: 3%
- Motor vehicles, trailers and semi-trailers: 3%
- Basic metals: 3%
- Computer, electronic and optical equipment: 2%
- Fabricated metal products: 2%
- Electrical machinery and apparatus, nec: 2%
- Other non-metallic mineral products: 2%
- Machinery and equipment, nec: 2%
- Manufacturing nec; recycling: 2%
- Other manufacturing: 2%
2. Trade Development
EU27 chemicals trade surplus reaches a lower level in 2021

Extra-EU27 chemicals trade balance

Source: Cefic Chemdata International
Specialty chemicals contributes most to EU27 chemicals trade

Extra-EU27 chemicals trade flows by sector (2021)

Exports 2021
- Specialties: 31%
- Petrochemicals: 24%
- Polymers: 17%
- Consumer chemicals: 9%
- Basic inorganics: 5%

Imports 2021
- Specialties: 27%
- Petrochemicals: 37%
- Polymers: 12%
- Consumer chemicals: 19%
- Basic inorganics: 5%

Source: Cefic Chemdata International
Top 10 EU27 partners account for 2/3 of EU27 chemicals trade*

EU27 chemicals trade* flows with top 10 partners (2021)

Source: Cacic Chemdata International
*Trade = exports + imports (in value terms)
EU27 holds trade surplus with top competing regions

EU27 chemicals trade flows with major geographic blocs (2021)

Source: Cefic Chemdata International
* Rest of Europe covers UK, Switzerland, Norway, Turkey, Russia and Ukraine
** North American Free Trade Agreement
*** Asia excluding China and Japan
Consumer chemicals contribute most to EU27 trade surplus

Extra-EU27 chemicals trade balance by sector

Source: Cefic Chemdata International
3. Growth and Competitiveness
EU27 chemicals output, far below the previous year’s level

EU27 chemical industry production

Source: Cefic Chemdata International
EU27 capacity utilisation below its long-term average

EU27 chemical capacity utilisation rate

Source: European Commission Business and Consumer Survey: companies answering the question
“At what capacity is your company currently operating (as a percentage of full capacity)?”
Europe at a competitive disadvantage compared to North America and Middle East

**Ethylene cash cost of regional steam crackers**

Source: ICS
Key emerging economies grow faster than the EU27 and the USA

Average chemicals production growth per annum (2011-2021)

- China: 7.3%
- Russia: 4.7%
- South Korea: 2.5%
- India: 1.5%
- Taiwan: 1.3%
- EU27: 0.4%
- Brazil: 0.2%
- Japan: -0.2%
- USA: -1.2%

Source: Cefic Chemdata International
4. Our contribution to EU industry
Top 10 sectors account for 70% of total EU27 manufacturing enterprises

Number of enterprises in the EU27 manufacturing industry (2020): top 10

- Fabricated metal: 30%
- Food products: 19%
- Printing: 13%
- Other non-metallic mineral products: 8%
- Textiles: 6%
- Rubber and plastic products: 6%
- Machinery & equipment n.e.c.: 6%
- Wood: 5%
- Wearing: 4%
- Furniture: 4%

Source: Eurostat
Consumer chemicals has the highest number of chemicals enterprises

Number of enterprises in the EU27 chemicals industry (2020): top 10

- Consumer chemicals: 11,000
- Other chemicals: 6,000
- Petrochemicals: 3,200
- Fertilizers: 2,200
- Industrial gases: 1,900
- Paints & coatings: 1,500
- Plastics: 1,100
- Other inorganic chemicals: 0.9
- Dyes and pigments: 0.6
- Crop protection: 0.5
- Others: 0.1

Source: Eurostat
Chemicals is the fourth-largest producer in EU27 manufacturing sector.

Top 10 sectors: turnover (€ billion, 2018)

- Others: 1,106
- Food products: 2,013
- Machinery & equipment: 940
- Basic metals: 700
- Refined petroleum products: 541
- Electrical equipment: 510
- Computer & electronic: 459
- Basic metals: 401
- Fabricated metal: 388
- Chemicals: 322
- Textiles: 321

Source: Eurostat
Chemicals* is the leading sector in terms of added value.
Petrochemicals has the highest added value in EU27 chemicals sector

**Added value in the EU27 chemicals industry (2020): top 10**

- **€142.7 billion**

**Category**
- Petrochemicals: 45%
- Consumer chemicals: 24%
- Other chemicals: 19%
- Plastics: 16%
- Paints & coatings: 12%
- Other inorganic chemicals: 7%
- Industrial gases: 6%
- Fertilizers: 3%
- Dyes and pigments: 2%
- Crop protection: 1%
- Others: 3%

*Source: Eurostat*
Chemicals* contributes 12% of EU27 manufacturing employment

Top 10 sectors: EU27 number of employees (millions of employees, 2020)

- Food products: 4.0
- Chemicals*: 3.4
- Fabricated metal & equipment n.e.c.: 3.2
- Machinery: 2.9
- Automotive: 2.5
- Electrical equipment: 1.4
- Other non-metallic mineral products: 1.1
- Computer & electronics: 1.0
- Basic metals: 0.9
- Furniture: 0.8

Source: Eurostat
*Pharmaceuticals and rubber & plastics included
Consumer chemicals is the largest employer in the EU27 chemicals sector.
EU27 Labour productivity grows at 1.5% (CAGR)

Labour productivity in the EU27 chemical industry

Average growth p.a 2011-2021
- Added value (+3.0%)
- Employment (+1.5%)
- Labour productivity (+1.5%)

Source: Eurostat
Chemicals* is the largest investor in EU27 manufacturing sector

Top 10 sectors: EU27 investment (€ billion, 2018)

- Chemicals* (50)
- Automotive (40)
- Food products (33)
- Fabricated metal (24)
- Machinery & equipment n.e.c. (22)
- Other non-metallic mineral products (13)
- Basic metals (12)
- Electrical equipment (11)
- Refined petroleum products (10)
- Paper (9)

Source: Eurostat
* Pharmaceuticals and rubber & plastics included
Petrochemicals is the largest investor in the EU27 chemicals sector

Capital spending in the EU27 chemicals industry (2020): top 10

- Petrochemicals: €6.4 billion
- Plastics: €1.8 billion
- Consumer chemicals: €1.9 billion
- Other inorganic chemicals: €1.3 billion
- Fertilizers: €1.4 billion
- Industrial gases: €0.4 billion
- Crop protection: €0.4 billion
- Dyes and pigments: €0.6 billion
- Paints & coatings: €0.6 billion
- Others: €0.4 billion

Source: Eurostat
Chemicals* generates the largest surplus in the European Economy

EU27 trade surplus in the European Economy (2020-2021): top 10

Source: Eurostat
*Pharmaceuticals included
5. Energy Consumption
EU27 gas and electricity account for 2/3 of total energy consumption.

Total energy consumption in the EU27 chemical industry by source (%, 2020)

- Solid fossil fuels: 37%
- Gas: 28%
- Oil and petroleum products (excluding biofuel portion): 15%
- Electricity: 14%
- Heat: 4%
- Non-renewable waste: 1%
- Renewables and biofuels: 1%

589 terawatt hours (TWh, 2020)

Source: Eurostat
EU27 energy consumption falls 22% since 1990

Energy consumption in the EU27 chemical industry

Source: Eurostat
EU27 gas consumption falls 25% since 1990
EU27 electrical energy consumption falls 15% since 1990

Electrical energy consumption in the EU27 chemical industry

Source: Eurostat
EU27 Total petroleum consumption falls 22% since 1990

Total petroleum products consumption in the EU27 chemical industry

Source: Eurostat
EU27 solid fuels consumption falls 68% since 1990

Solid fuels consumption in the EU27 chemical industry

Source: Eurostat
EU27 Renewable energies consumption more than doubled

Renewable energies consumption in the EU27 chemical industry

Source: Eurostat
EU27 specific energy consumption* dropped by 45%

Efficient use of energy in the EU27 chemical industry

Source: Eurostat
*Specific energy consumption index is calculated as (energy consumption index/production index), (1990=100)
EU27 chemicals performance* is slightly higher than overall industry

EU27 specific energy consumption*: Chemicals vs total industry

Source: Eurostat

*Specific energy consumption index is calculated as (energy consumption index/production index), (1990=100)
6. Capital and R&I Spending
EU27 capital spending increased significantly in 2021

Capital spending in the EU27 chemical industry

Source: Cefic Chemdata International
China leads the global chemicals investment

Capital spending in the chemicals industry by region (2021 vs 2011)

Source: Cefic Chemdata International
*Rest of Europe covers UK, Switzerland, Norway, Turkey, Russia and Ukraine
**North American Free Trade Agreement
***Asia excluding China, India, Japan and South Korea
High capital intensity in the EU27 chemical sector

Capital intensity in the EU27 chemical industry

Source: Eurostat
EU27 capital intensity below China and India economies

Capital spending (% of added value, 2021 vs 2011)

Source: Caixic Chardata International
* Rest of Europe covers UK, Switzerland, Norway, Turkey, Russia and Ukraine
** North American Free Trade Agreement
*** Asia excluding China, India, Japan and South Korea
EU27 loses more than 50% of its original market share

EU27 share of global chemicals investment

Source: Cefic: Chemdata International
Decreasing share of chemicals capital spending for the EU27

Chemicals capital spending by country (2011 vs 2021)

2011 (% of total)
- China: 14%
- NAFTA*: 2%
- EU27: 5%
- Rest of Asia***: 12%
- Rest of Europe**: 11%
- Rest of the world: 40%
- Total: €139 billion

2021 (% of total)
- China: 11%
- NAFTA*: 2%
- EU27: 4%
- Rest of Asia***: 12%
- Rest of Europe**: 4%
- Rest of the world: 48%
- Total: €225 billion

Source: Cetic Chemdata International
* North American Free Trade Agreement
** Rest of Europe covers UK, Switzerland, Norway, Turkey, Russia and Ukraine
*** Asia excluding China, India, Japan and South Korea
EU27 R&I spending reaches the highest level in 2021
EU27 is the second largest R&I investor in the world

R&I spending in the chemicals industry by region (2011 vs 2021)

Source: Cefic Chemdata International
Decreasing share of R&I spending for the EU27, USA and Japan
7. Environmental Performance
EU27 scope 1 GHG emissions fall 55% since 1990

Total scope 1 GHG emissions* by the EU27 chemical industry

Source: European Environment Agency (EEA)
*Germany and Malta did not separately report GHG emissions from combustion of fuels in the chemical sector.
EU27 scope 1 GHG emissions* fall by 149 million tonnes (CO2) since 1990

Total scope 1 GHG emissions* per type of GHG by the EU27 chemical industry

Source: European Environment Agency (EEA)
*Germany and Malta did not separately report GHG emissions from combustion of fuels in the chemical sector.
EU27 chemical production and greenhouse gas emissions decouple

Total GHG emissions and production in the EU27 chemical industry

Source: European Environment Agency (EEA) and Cefic Chemdata International
EU27 greenhouse gas intensity plummets significantly since 1990

Total EU27 GHG emissions and energy consumption in the EU27 chemical industry

Source: European Environment Agency (EEA)
EU27 chemical waste fall by nearly one third since 2007

Total hazardous and non-hazardous waste in the EU27 chemicals industry

Source: European Pollutant Release and Transfer Register (E-PRTR)

* Slovakia did not report data under the EU Registry. Data for Germany, Latvia, Lithuania, Liechtenstein, Luxembourg, and Portugal are incomplete for 2018 and 2019. Data for Italy, Malta, and Switzerland are incomplete for the year 2019.
Number of accidents dropped by 22% in the EU27 chemical industry

EU27 number of accidents at work: chemicals vs manufacturing

Source: Eurostat
Accidental pollutant releases by the EU27 chemicals industry

Accidental pollutant release in the EU27 chemical industry

Source: European Pollutant Release and Transfer Register (E-PRTR)
*Slovenia did not report data under the EU Registry.
Data for 2018 and 2019 are incomplete for Germany, Lithuania and Liechtenstein.
Data for 2020 is incomplete for Germany, Italy, Lithuania and Malta.
EU27 acidifying emissions fall by more than 60% since 2007

Acidifying emissions by the EU27 chemical industry

Source: European Pollutant Release and Transfer Register (E-PRTR)
*Slovakia did not report data under the EU Registry.
Data for 2018 and 2019 are incomplete for Germany, Lithuania and Liechtenstein.
Data for 2020 is incomplete for Germany, Italy, Lithuania and Malta.
EU27 Methane & NMVOC Emissions to air fall by 70% since 2007

Methane & NMVOC emissions by the EU27 chemical industry

Source: European Pollutant Release and Transfer Register (E-PRTR)
*Slovakia did not report data under the EU Registry.
Data for 2018 and 2019 are incomplete for Germany, Lithuania and Liechtenstein.
Data for 2020 is incomplete for Germany, Italy, Lithuania and Malta.
EU27 Emission of water pollutants dropped significantly since 2007

Total organic carbon emissions by the EU27 chemical industry

Source: European Pollutant Release and Transfer Register (E-PRTR)
*Slovakia did not report data under the EU Registry.
Data for 2018 and 2019 are incomplete for Germany, Lithuania and Liechtenstein.
Data for 2020 is incomplete for Germany, Italy, Lithuania and Malta.
EU27 total Nitrogen & Phosphorous emissions dropped significantly

Total Nitrogen & Phosphorous Emissions to water by the EU27 chemical industry

Source: European Pollutant Release and Transfer Register (E-PRTR)
*Slovakia did not report data under the EU Registry.
Data for 2018 and 2019 are incomplete for Germany, Lithuania and Liechtenstein.
Data for 2020 is incomplete for Germany, Italy, Lithuania and Malta.
About Cefic
Cefic, the European Chemical Industry Council, founded in 1972, is the voice of large, medium and small chemical companies across Europe, which provide 1.1 million jobs and account for 15% of world chemicals production. Cefic members form one of the most active networks of the business community, complemented by partnerships with industry associations representing various sectors in the value chain. A full list of our members is available on the Cefic website.

Cefic is an active member of the International Council of Chemical Associations (ICCA), which represents chemical manufacturers and producers all over the world and seeks to strengthen existing cooperation with global organisations such as UNEP and the OECD to improve chemicals management worldwide.