

DATA AND FACTS AT A GLANCE

Portrait of the German Chemical Industry



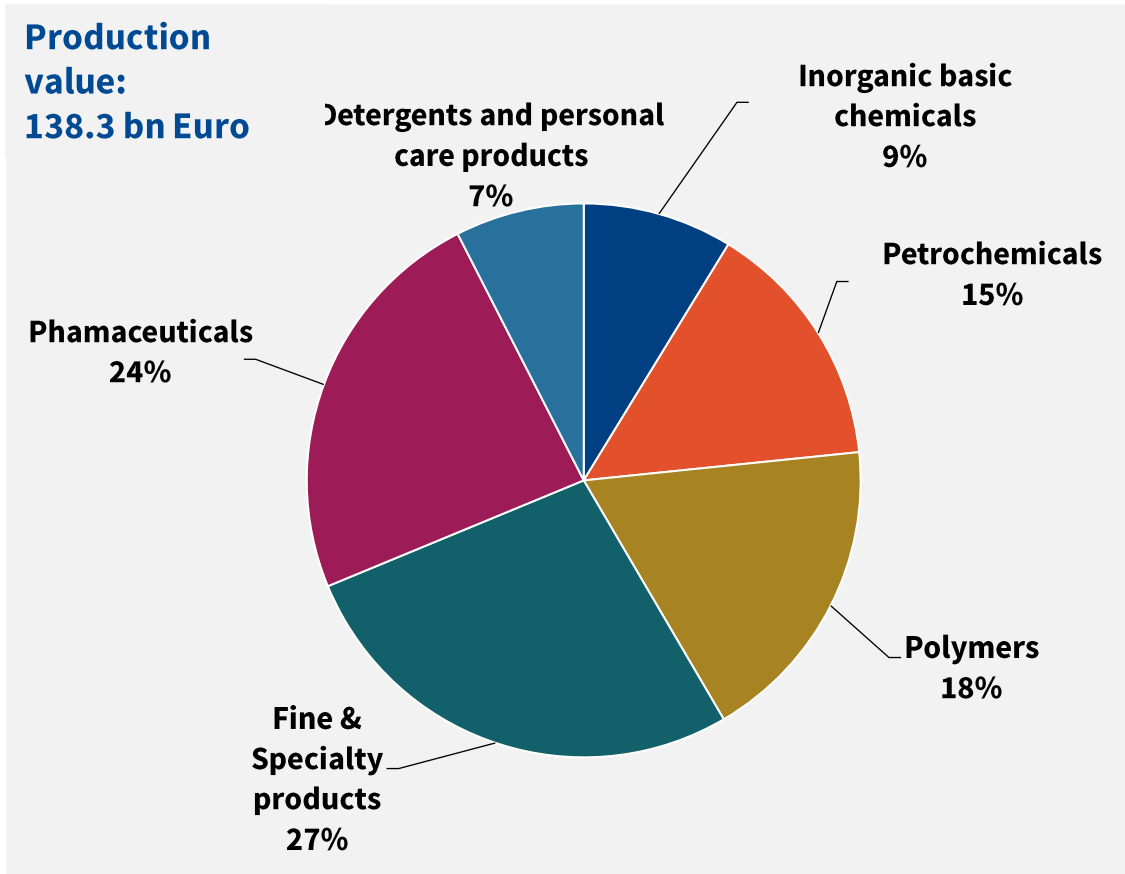
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Status: July 2022 (automatic translation of the German version)

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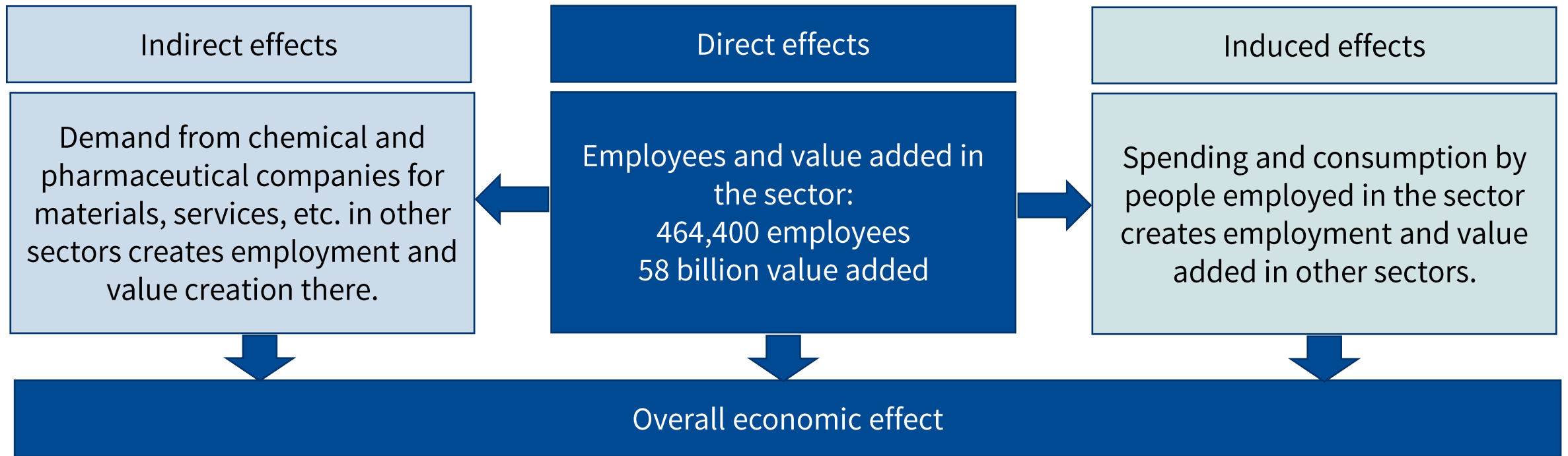
Sector portrait - Key figures at a glance 2021



Sources: Federal Statistical Office, VCI

- Wide product range
- Turnover: 227 billion euros, of which 60 % abroad
 - 3rd place after automotive and mechanical engineering
- Rank 1 in Europe, rank 3 worldwide
- Production growth in the last 5 years: 0.9 %.
- 473,200 employees, highest figure in 20 years
- Capital expenditure on property, plant and equipment in Germany: 8.6 billion euros, abroad: 9.4 billion euros
- R&D expenditure: 13.2 billion euros
- SME share: > 90 %

Importance of the industry for the overall economy



Every job in the companies in the sector **leads to about 2 more jobs** in the German economy. At last count, this amounted to around 900,000 people.

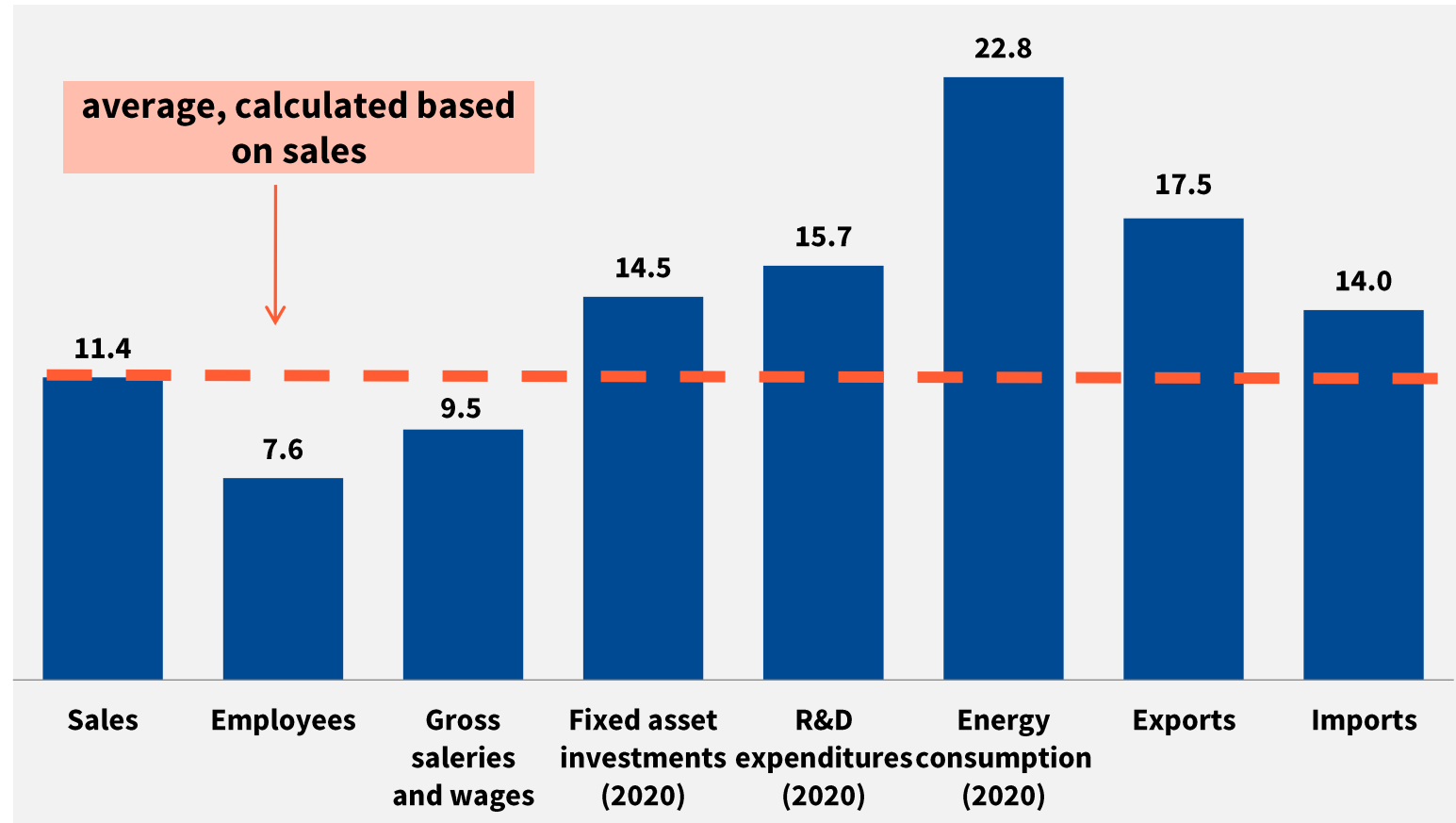
Every euro of direct value added generated by companies in the sector **triggers another 0.8 euros of additional value added in the** German economy. Most recently, this was around 48 billion euros.

The sector is the core of Germany as an industrial country

It is capital-, research- and energy-intensive and export-oriented

Key figures at a glance

Shares of the industry in manufacturing, 2021



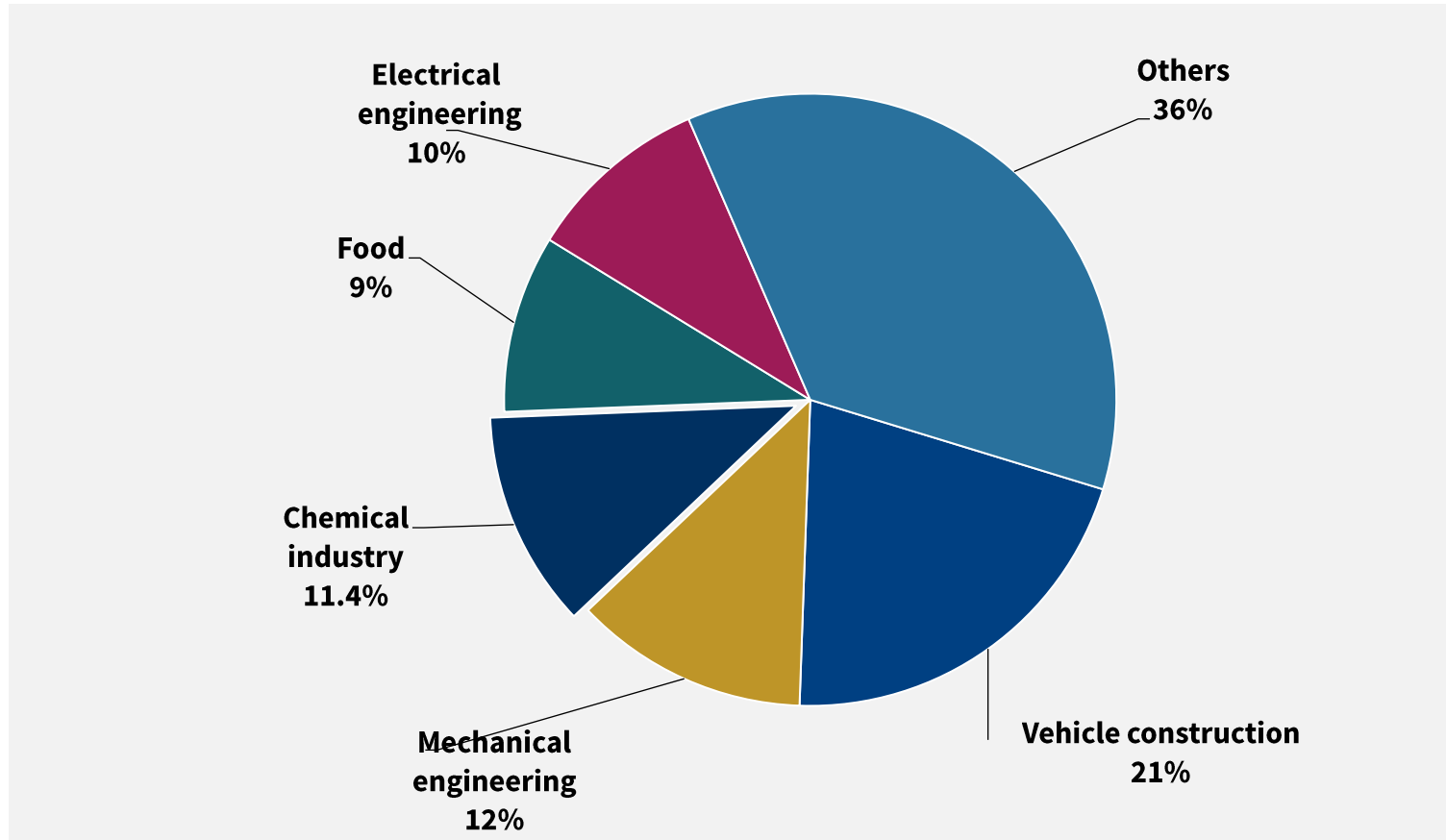
Sources: Destatis, Stifterverband, VCI

- ◆ The German chemical and pharmaceutical industry generates more than 11 percent of the turnover in the manufacturing sector.
- ◆ Research and development (R&D) and investments have a high priority in the industry.
- ◆ Chemistry is energy-intensive.
- ◆ The industry is active worldwide and competes internationally.

The sector comes third among industrial sectors in Germany

Share of manufacturing turnover

In percent, 2021



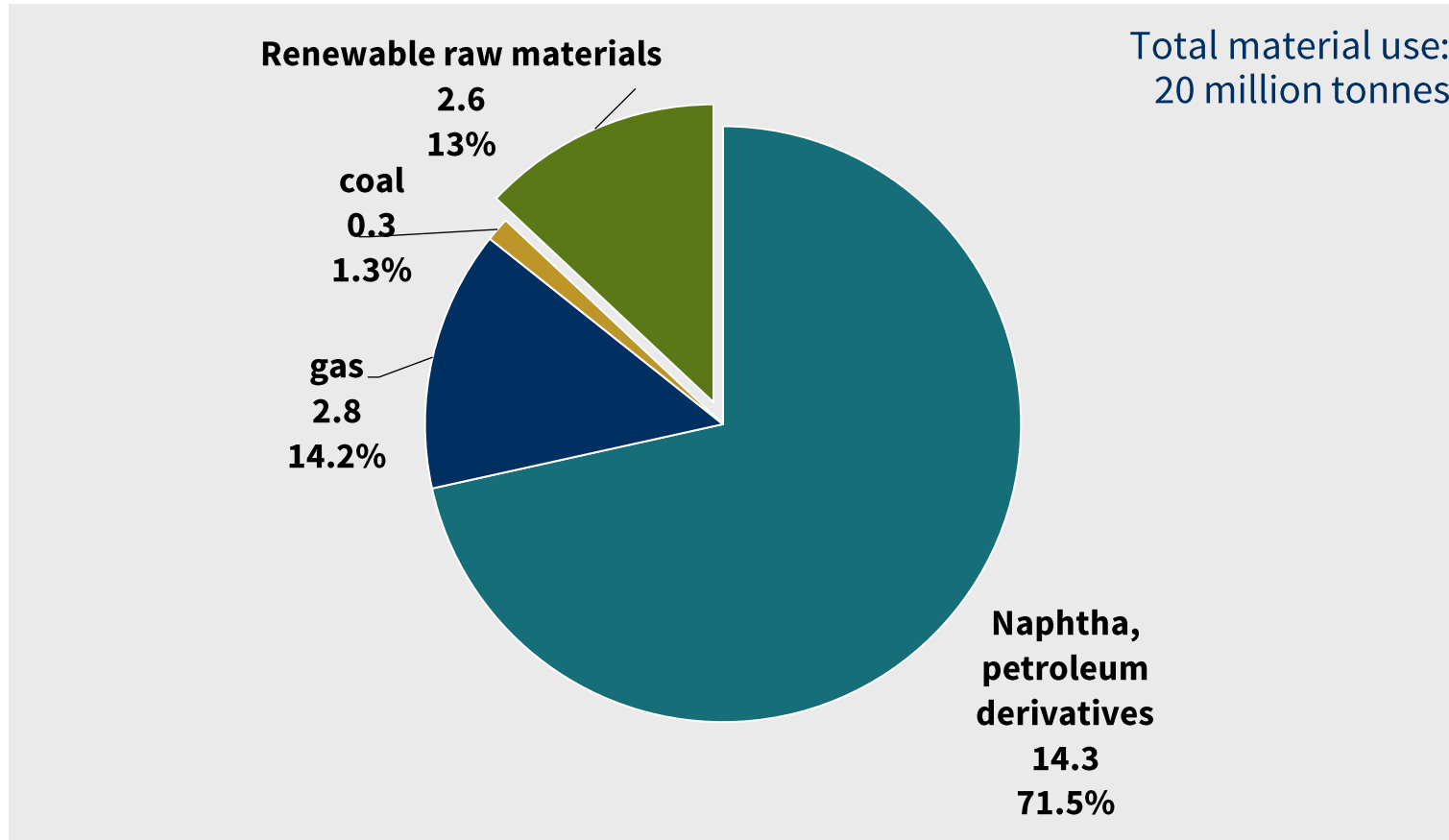
Sources: Destatis, VCI

- ◆ The German chemical and pharmaceutical industry generates more than 11 percent of the turnover in the manufacturing sector.
- ◆ This is third after vehicle manufacturing and mechanical engineering.

The raw material base of the chemical industry

Naphtha is the most important raw material in organic chemistry

Raw material base of organic chemistry in Germany, in million tonnes, shares in percent, 2020

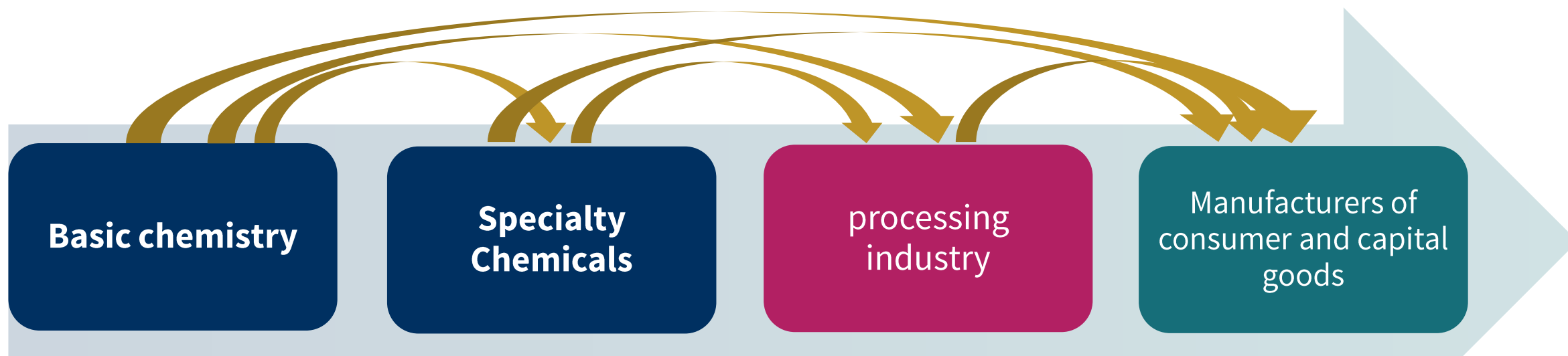


- ◆ Mineral oil products are still the most important raw materials for production in the chemical industry.
- ◆ So far, renewable raw materials have a share of a good 13 percent. They mainly go directly into the production of special chemicals.

Sources: VCI, FNR

Basis: tonnes of raw material

Chemistry is at the beginning of many value chains



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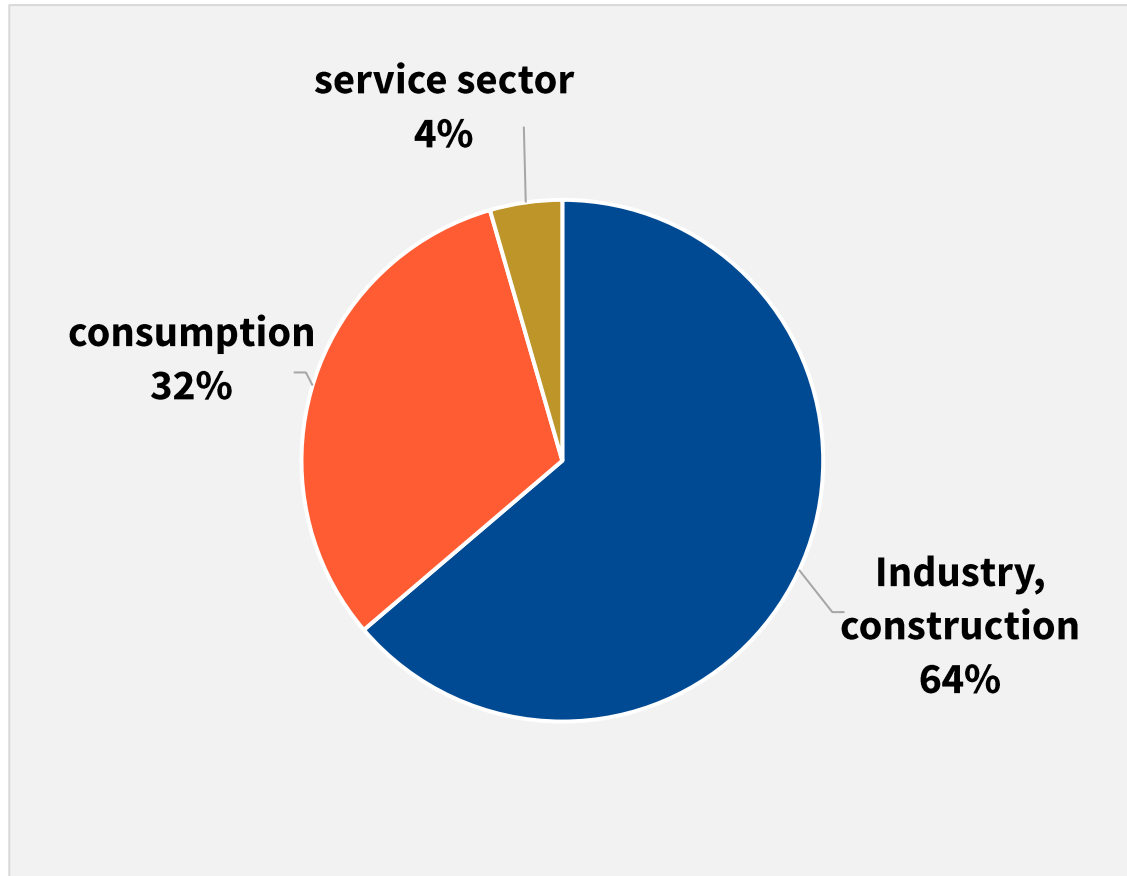


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Domestic production is further processed within the industry

Domestic sales structure of the chemical-pharmaceutical industry

2019



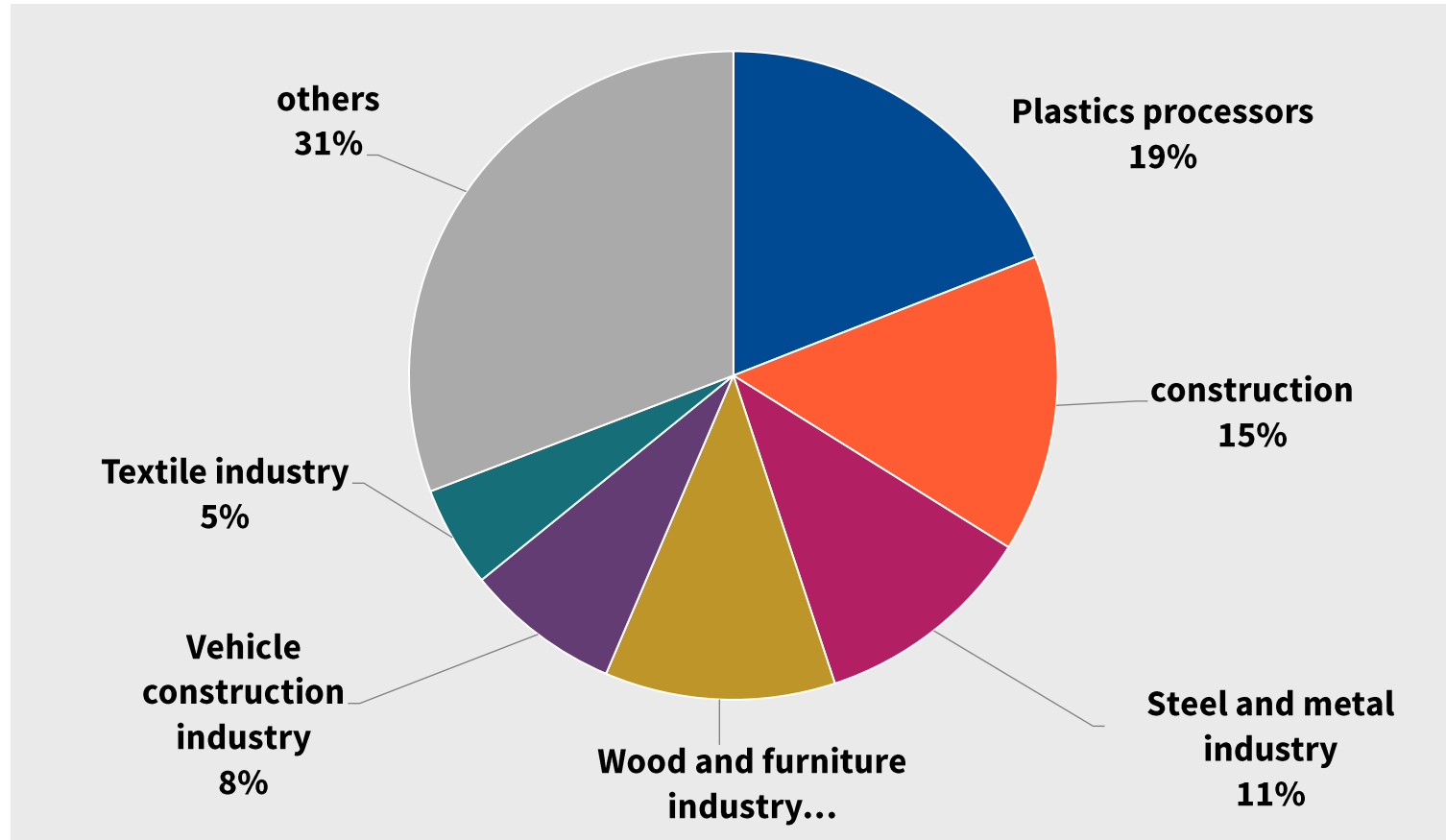
Source: Destatis, VCI

- ◆ Domestically, almost one third of domestic production goes directly to consumption and 4 percent to service sectors.
- ◆ More than 60 per cent of the production is further processed within the industry (without pharmaceuticals, the share rises to 84 per cent).
- ◆ Due to the high value-added depth of the industry, further processing also mainly happens within the chemical and pharmaceutical industry. The chemical industry itself is its best supplier and customer.

Main domestic customers for chemical products: plastics processors

Sales of the chemical and pharmaceutical industry to other industrial sectors

2019, excluding deliveries to the chemical industry, DL, consumption and abroad



Source: Destatis, VCI

- ◆ The main customers of the industry are plastics processors. Vehicle construction follows in 5th place.
- ◆ However, only direct sales are taken into account here. If indirect deliveries (via plastics processors, the electrical industry, the textile industry, mechanical engineering) are included, around 15-20 percent of domestic production goes to the automotive industry.

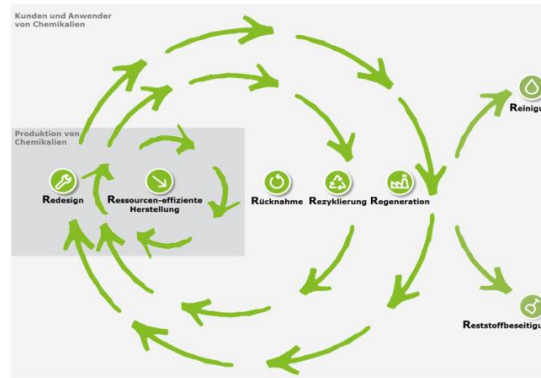
New value creation structures emerge



Global value chains

Chemistry:

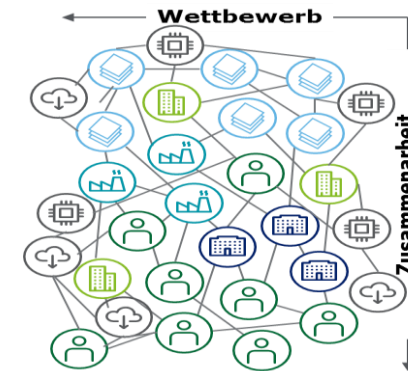
Growth and innovation engine
 At the beginning of global value chains
 Threat of slow growth, erosion of innovation leads and locational disadvantages



Circular economy

Chemistry:

Enablers of the circular economy
 Efficient and climate-friendly production
 Essential part of global value chains



Digitalisation and networking

Chemistry:

Exploits the opportunities of digitalisation
 Develops new business models
 New distribution of roles in global value creation networks

Chemistry: Innovation engine of a circular future

Circular economy

Resource base

Renewable Energy
Renewable raw materials
Secondary raw materials

Resource efficiency

Throughout the product life cycle:
Supplier
Production
Customer

Resource conservation

Climate protection
Conservation of ecosystems

Circular economy

Take-back
Reuse
Material and energy recovery

Digitalisation drives circular economy



Sashkin/stock.adobe.com

Blockchain solutions to enable the traceability of substances in the value chain



Roman Milert/stock.adobe.com

Digital currencies to incentivise the collection of plastics in developing countries



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Digital platforms for the trade of high-purity recyclables

Many global players in the chemical and pharmaceutical industry

The 20 top-selling German chemical companies in 2021

	company	sales (mn Euro)	employees
1	BASF SE	78598	111047
2	Bayer AG	44081	99637
3	Fresenius SE & Co. KGaA	37520	316078
4	C.H. Boehringer Sohn AG & Co. K	20618	52000
5	Henkel AG & Co. KGaA	20066	52450
6	Merck KGaA	19687	60348
7	BioNTech SE	18977	3138
8	Covestro AG	15903	17900
9	Evonik Industries AG	14955	33004
10	B. Braun SE	7860	66234
11	Beiersdorf AG	7627	20567
12	Lanxess AG	7557	14866
13	Wacker Chemie AG	6208	14406
14	Symrise AG	3826	11151
15	Stada Arzneimittel AG	3250	12520
16	K+S AG	3213	10711
17	Fuchs Petrolub SE	2871	5976
18	Altana AG	2667	6731
19	Paul Hartmann AG	2302	10628
20	Westfalen AG	1871	1814

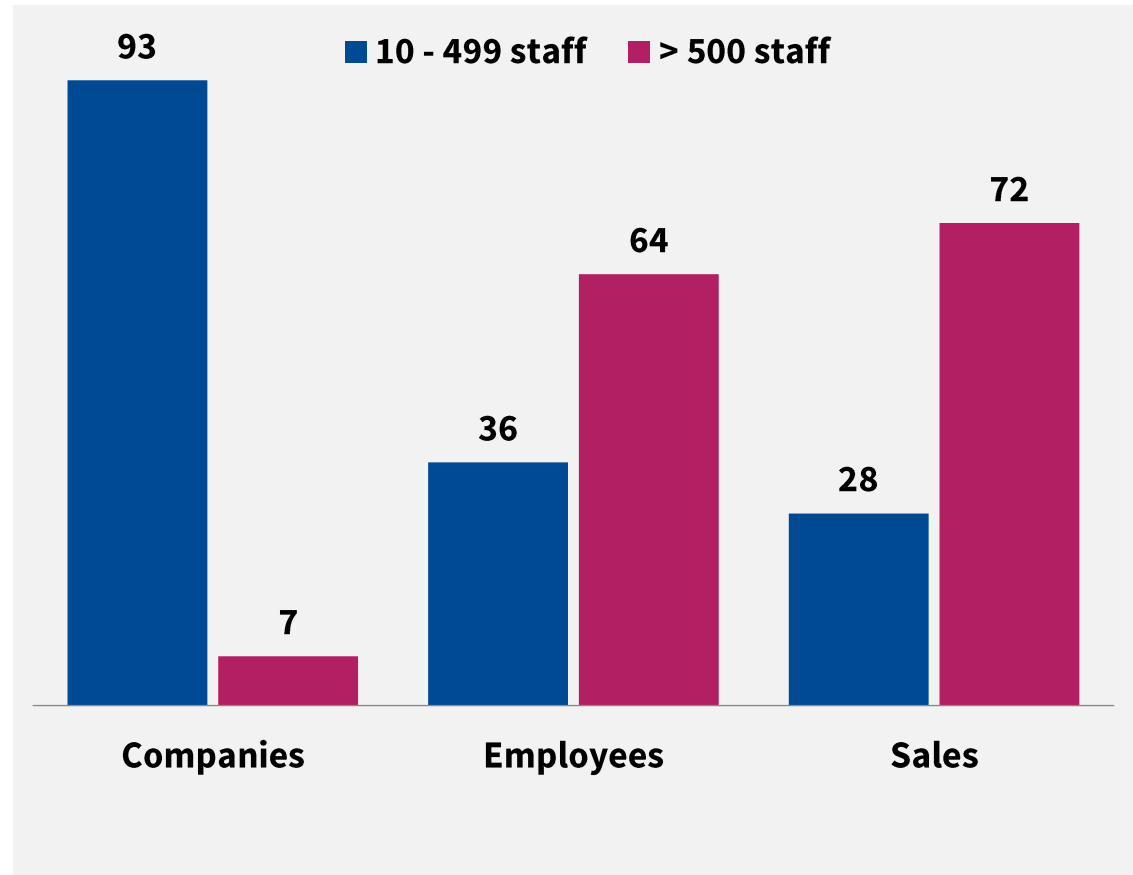
- Many globally active chemical and pharmaceutical companies have their headquarters in Germany.
- Large chemical companies often supply intermediate products that medium-sized companies process into end products. This distinguishes the chemical industry from other sectors.

Source: Die Welt (19 July 2021)

Over 90 percent of the companies are medium-sized

Size structure of the chemical-pharmaceutical industry

Number of companies, employees and turnover by size class, 2020, shares in percent

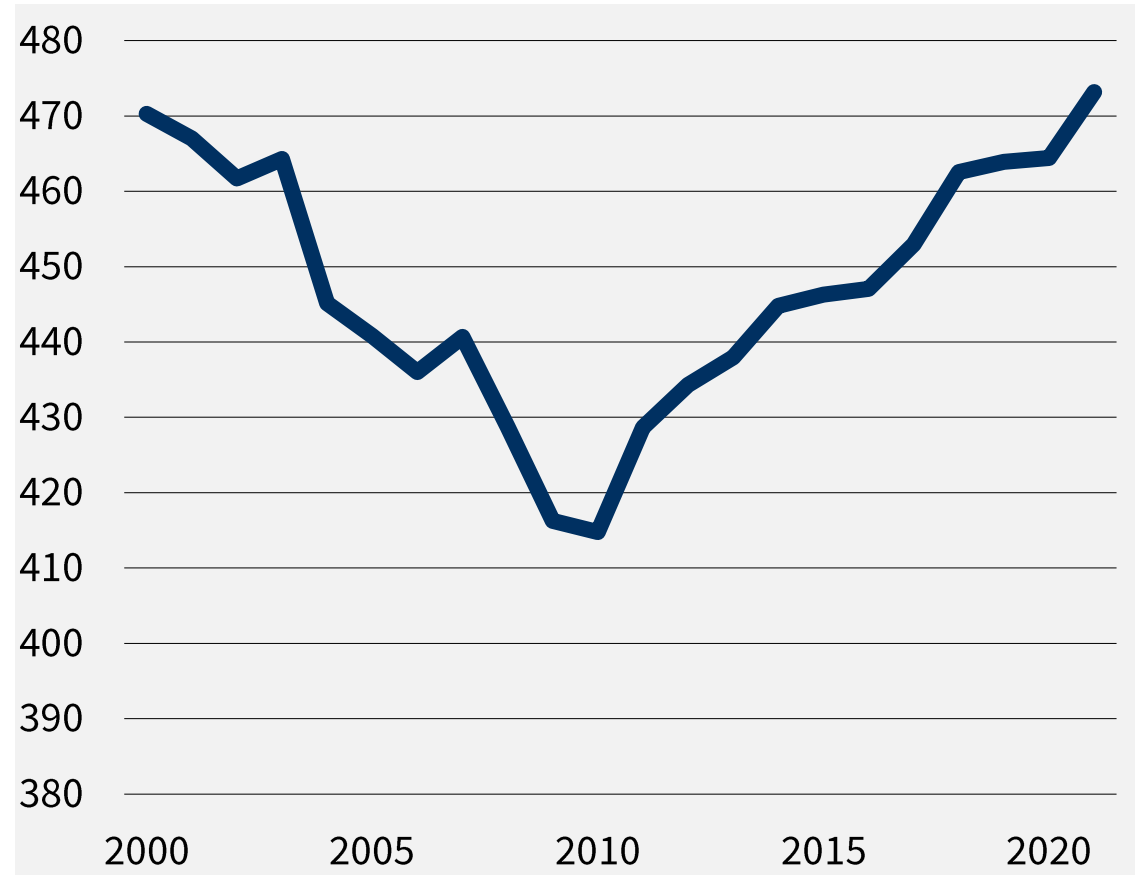


Sources: Destatis, VCI

- With a good 2,000 companies, over 92 percent of the chemical companies are small and medium-sized enterprises (SMEs) with fewer than 500 employees.
- With almost 179,000 employees, 36 percent of the chemical workforce work in SMEs.
- SMEs generate more than 28 percent of chemical sales. That was 63 billion euros at last count.
- The production of basic chemicals is the domain of large companies. SMEs then process these products into fine and speciality chemicals.

Rising employment figures over the past 10 years

Employees in the chemical and pharmaceutical industry in 1000



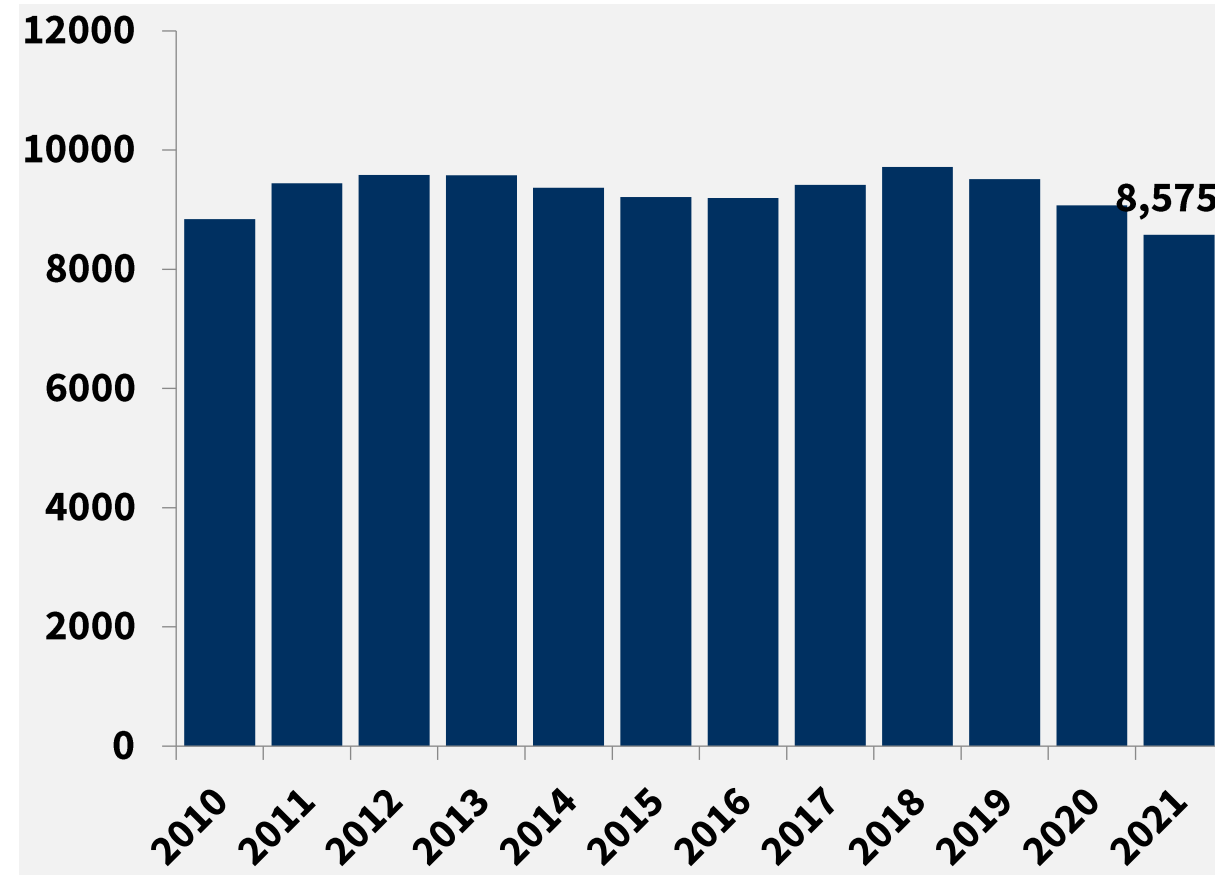
Source: Destatis

- The German chemical industry is the sixth largest employer in Germany.
- The sector offers secure and well-paid jobs and has built up employment in recent years (+58,000 employees since 2010).
- With an average of almost 64,000 euros in 2021, salaries in the sector are almost almost 25 percent above the average for the manufacturing sector.

The industry trains

Apprenticeships in Germany

Number of apprenticeships in the chemical and pharmaceutical industry + parts of the rubber and plastics industry (BAVC)



Source: BAVC

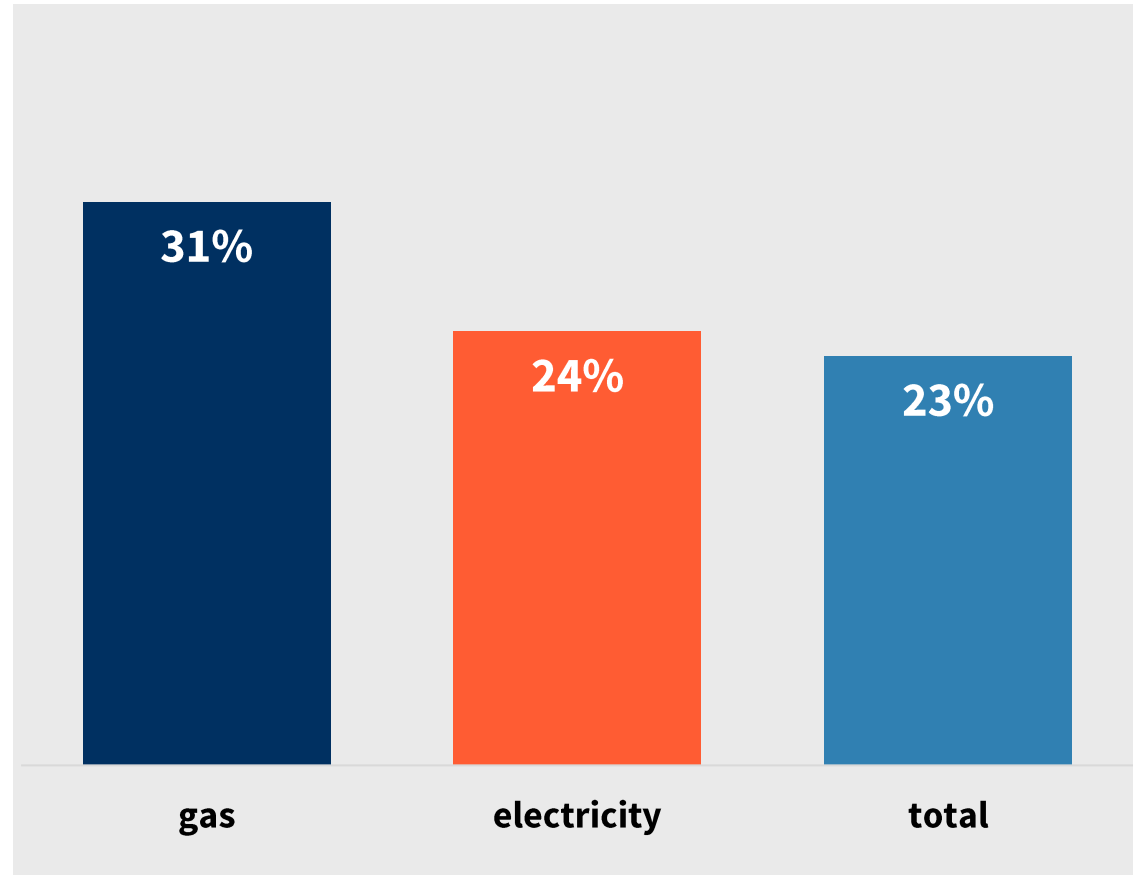
BAVC delimitation including parts of the rubber and plastics industry

- ◆ For the technically demanding jobs, the chemical industry needs qualified and competent employees. That is why it trains its own employees.
- ◆ Due to the pandemic, less capacity is available for training in technical centres, laboratories and workshops. In addition, the training market is changing. More and more positions cannot be filled. This has recently depressed the supply of training places.
- ◆ After successful completion of training, more than 90 per cent of those trained are taken on (2021: 93 per cent).

Chemistry is energy-intensive, but reduces energy consumption and emissions

Shares of the chemical and pharmaceutical industries in manufacturing consumption

Final energy consumption by energy source and total, 2020



Source: Destatis, VCI

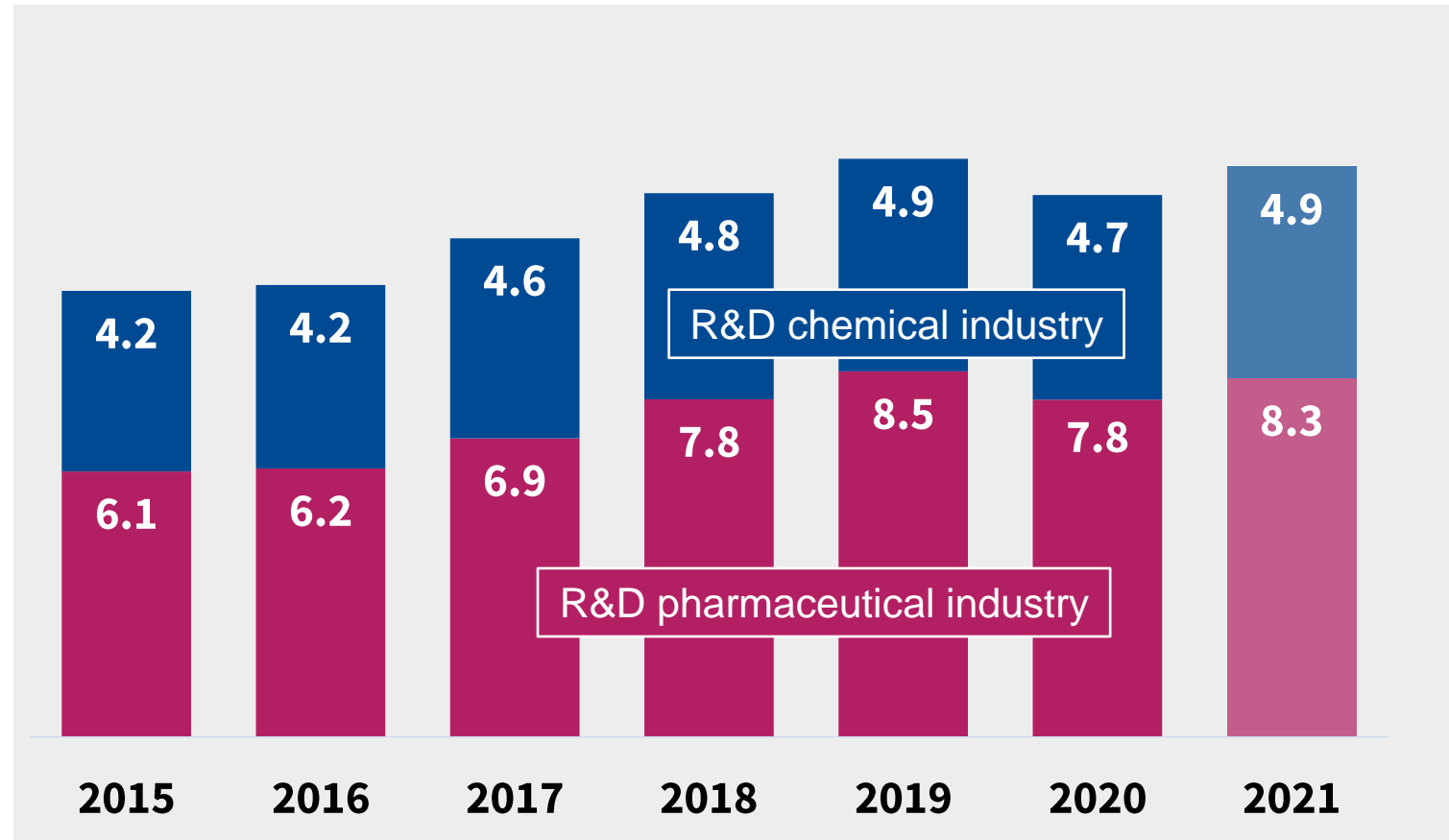
Without material use

- ◆ Almost 9 percent of Germany's energy consumption and almost 23 percent of the energy consumption of the manufacturing industry is accounted for by the chemical industry. If the material use of energy sources is added, the industry has a share of over 30 percent.
- ◆ Since 1990, energy consumption in the sector has fallen by 19 percent.
- ◆ Overall, the industry is responsible for 5.5 percent of CO₂ emissions in Germany. Compared to 1990, the industry has reduced its energy consumption and greenhouse gas emissions by around 55 percent.

The German chemical and pharmaceutical industry is strong in research

Research and development expenses

External and internal R&D expenditure of the chemical and pharmaceutical industry in billion euros



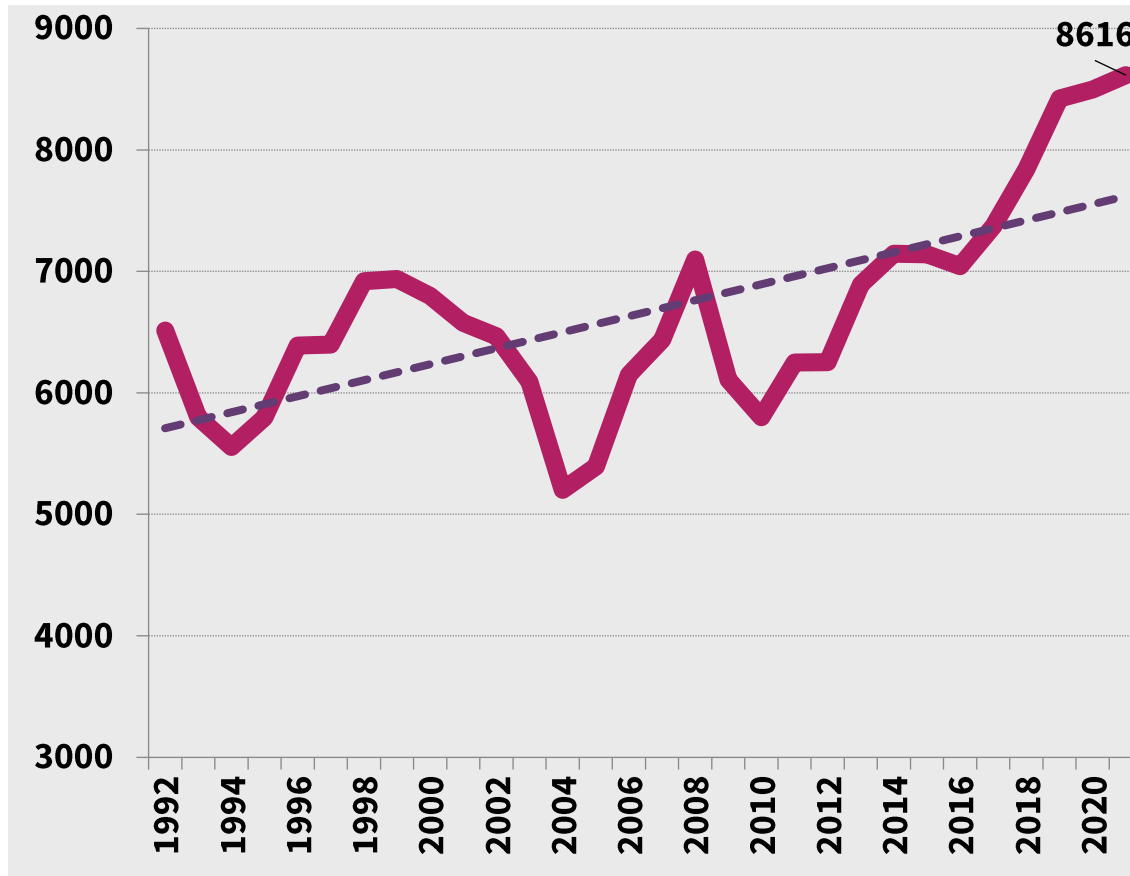
Sources: Stifterverband, VCI

2021: Estimate

- ◆ The Corona measures put the brakes on research and development. Budgets recovered to almost pre-crisis levels in 2021.
- ◆ With 13.2 billion euros, the industry recently invested almost 6 percent of its turnover in R&D.
- ◆ Only vehicle manufacturing and the electrical industry invest more in research and development.

The industry is capital intensive and invests in transformation

Capital expenditure on property, plant and equipment by the German chemical/pharmaceutical industry in million euros and trend



Sources: Destatis, VCI

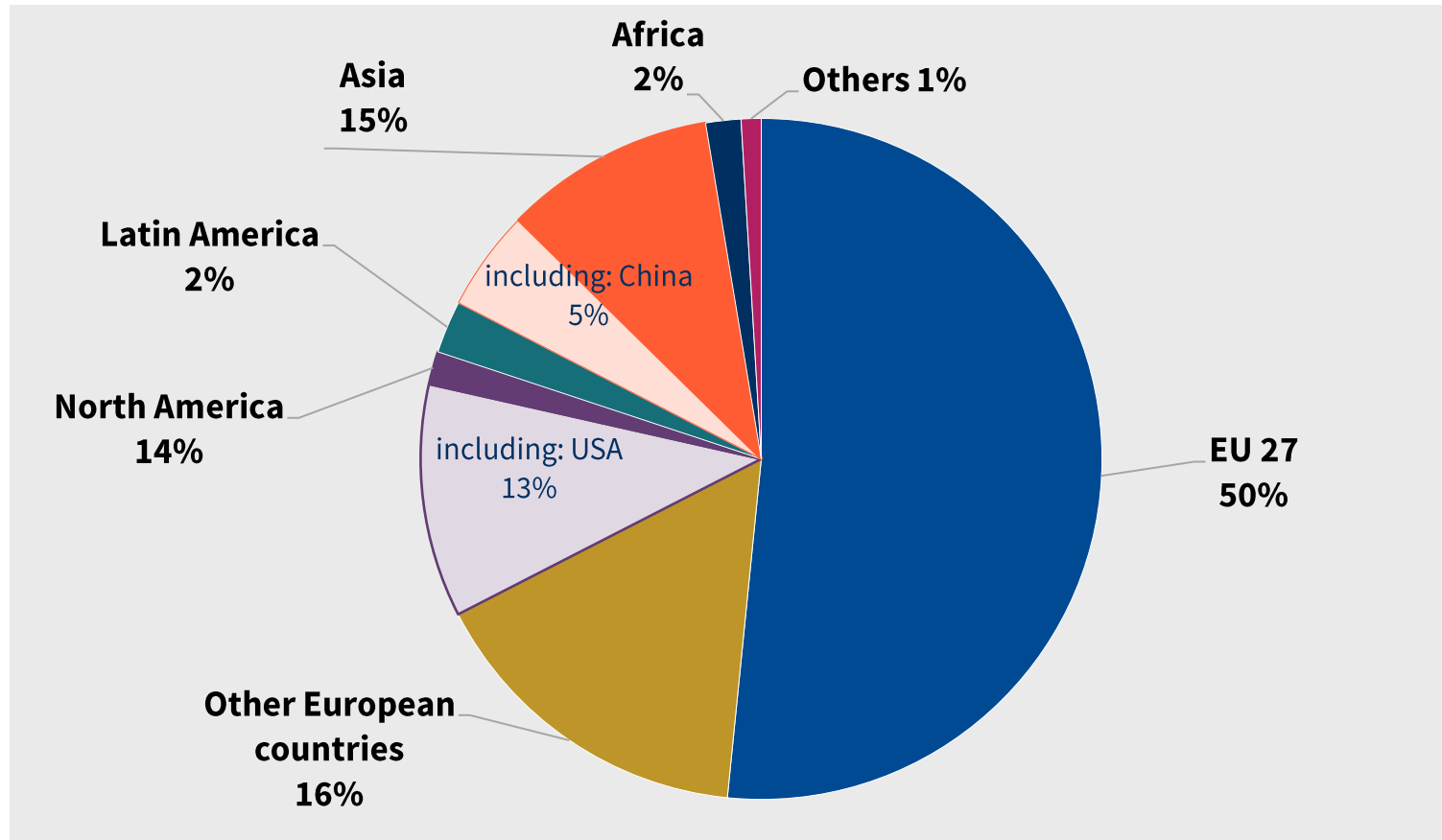
2021: Estimate

- ◆ Turnaround in investment: Domestic investment has been rising strongly since 2010.
- ◆ The transformation requires investment: According to the "Roadmap Chemistry 2050", additional investments of more than 60 billion euros are needed by 2050.

The industry is export-oriented - its most important sales market is Europe

Exports of the German chemical and pharmaceutical industry by region

Shares in percent, 2021



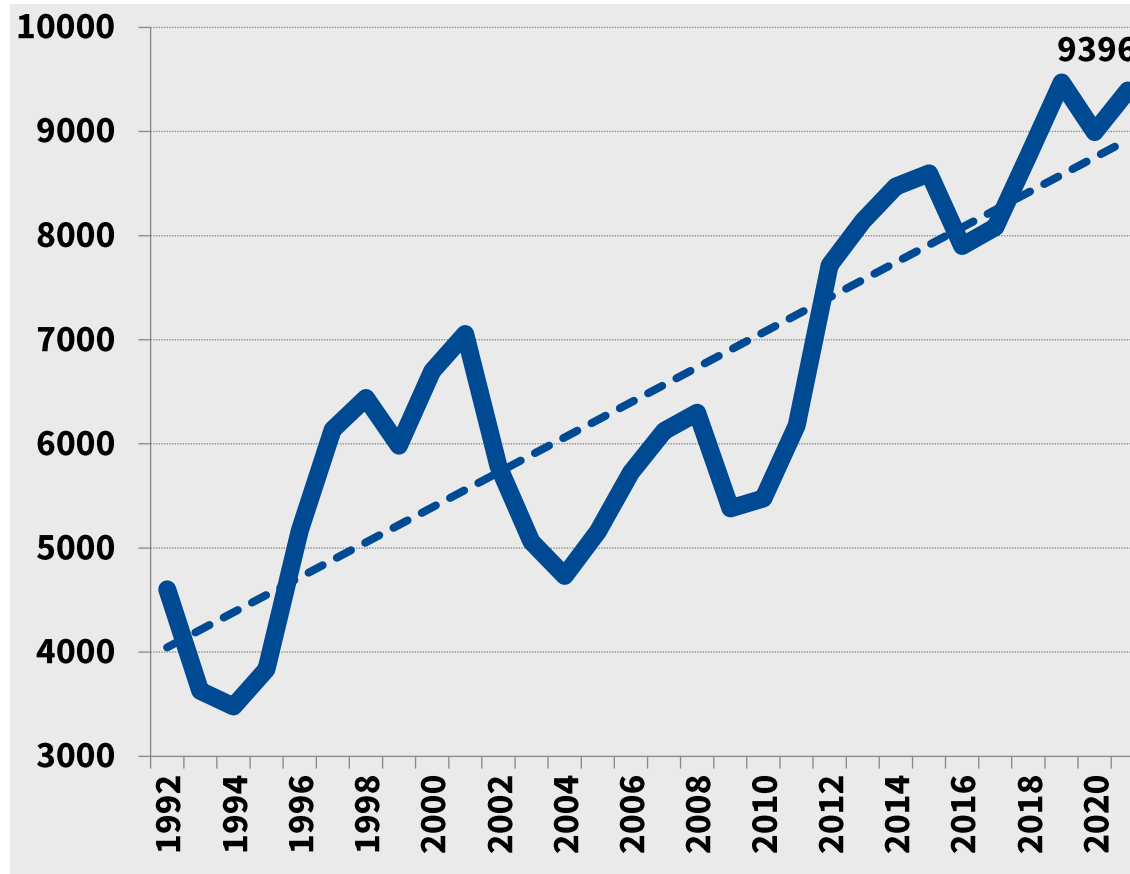
- Europe is the most important sales market for the German chemical and pharmaceutical industry.
- Half of the exports go to the EU 27 countries.
- Another 16 per cent to the other countries in Europe.
- USA is the most important market outside Europe.

Sources: Destatis, VCI

Estimate based on preliminary data

The industry invests abroad and benefits from market growth via production on site

Capital expenditure by the German chemical and pharmaceutical industry abroad
in million euros and trend



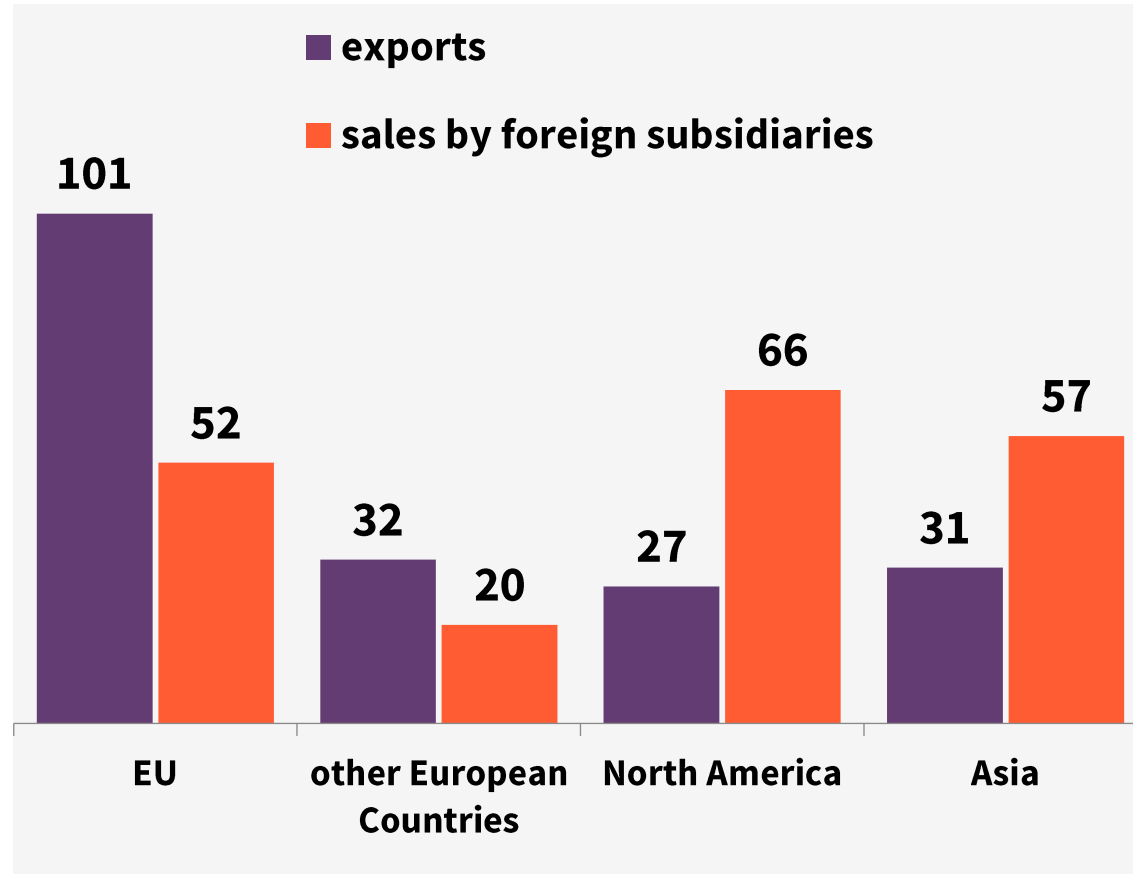
Source: VCI

- ◆ The dynamics of foreign investments in the German chemical and pharmaceutical industry are high. Since 2012, foreign investments have also exceeded domestic investments. Reasons for this:
 - ◆ Globalisation strategy: Participation in market growth
 - ◆ Cheaper raw material costs abroad
 - ◆ Barriers to investment at home

The German chemical and pharmaceutical industry is at home on the world markets

German chemical exports and sales of German chemical subsidiaries abroad

In billions of euros, 2020



Sources: German Bundesbank, Destatis, VCI

- Market development strategies differ depending on the region.
- Europe is developed through exports - the turnover of the subsidiaries is far lower than the export earnings.
- In Asia and North America, the sales of the subsidiaries there far exceed the export revenues.
- The most important market for the German chemical industry is the EU. 50 percent of exports go to the EU. As a production location, the EU follows North America in second place.

Importance of foreign subsidiaries is high

Key figures of the chemical subsidiaries of German companies abroad
2020



Sources: Deutsche Bundesbank, Federal Statistical Office, VCI

Further information

- ◆ Facts and figures on investments in the industry: [Focus on investments](#)
- ◆ Facts and figures on research and development: [Germany as a location for innovation](#)
- ◆ Facts and figures on energy and raw materials: [Energy statistics at a glance](#)
- ◆ Facts and figures on global chemical markets: [Chemical markets worldwide](#)
- ◆ Facts and figures on the industrial location: [Industrial country Germany](#)



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