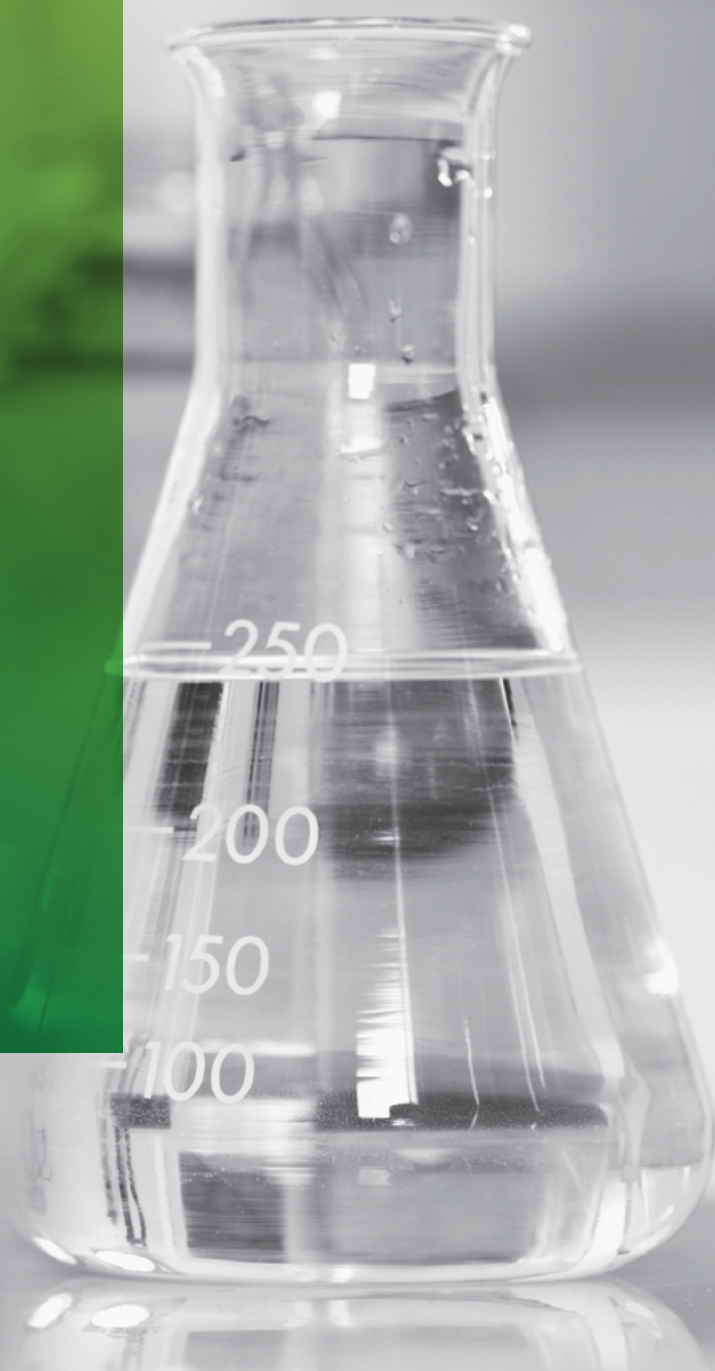


INDUSTRY OVERVIEW

The Chemical Industry in Germany

ISSUE 2017/2018



Germany – Global Chemical Industry Heavyweight

Germany's chemical industry is number one in Europe. The industry employs a highly trained workforce of some 330 thousand people. Businesses and research institutes involved in the sector invest substantially in research and development activities. This makes the industry a driving force for innovation. By developing new materials and high-performance chemicals and plastics, the chemical industry sets the benchmarks for advancing state-of-the-art technologies. This creates benefits for a number of different fields such as energy efficiency and storage and mobility. Many leading international chemical firms choose to locate in Germany.

They are drawn to Germany because of its excellent research landscape, state-of-the-art logistics, and world-class infrastructure. Germany's central geographical location at the heart of Europe provides a further decisive advantage, giving access to a market of more than 500 million customers in the European Union.



Germany's chemical industry – at the market crossroads of Europe



The Industry in Numbers

The Global Chemicals Market

The global chemicals market is in excellent shape. This is reflected primarily in the huge increase in global revenue from EUR 1,622 billion to EUR 3,534 billion during the decade 2005 to 2015 (equivalent to an average annual growth rate of more than eight percent). Seen from this perspective, the global chemical industry appears not to have been adversely affected by the financial crisis of 2008. Chemical companies worldwide have in fact been recording growing revenue and profit levels – as well as mostly double-digit operating margins – since 2010. This development has been reinforced by the low-interest rate policies of the most influential central banks globally. Excellent credit ratings have allowed companies to refinance at lower interest rates and take out new loans more easily. This strategy has been used by a number of chemical companies to sharpen their portfolios through mergers and acquisitions (M&A) transactions and equity investments.

Germany: World Number Three

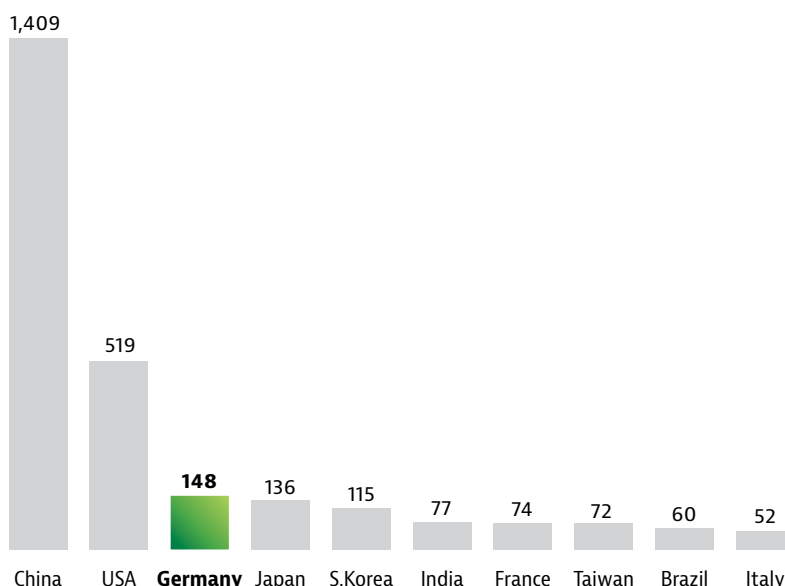
The balance of power in the global industry has shifted. The chemical industry in China – with revenue of EUR 1,409 billion and a global share of about 40 percent – was the biggest market in 2015, followed by the US (EUR 519 billion), Germany (EUR 148 billion), and Japan (EUR 136 billion). The Chinese chemical market is bigger than the European and North American markets combined (accounting for almost 17 percent of the international market each); this being due to incredible sales growth averaging around 22 percent annually during the period 2005 to 2015.

Europe's Chemicals Leader

The German Chemical Industry Association (VCI) reported that Germany accounted for 28 percent of the EUR 519 billion in sales in the total European market in 2015, thereby maintaining the lion's share of revenue. Europe's share of the global chemicals market has dropped from 32 percent to 15 percent over the past two decades. However, thanks to a large increase in the size of the global market, this 17 percentage point decline actually describes growth from EUR 326 billion to EUR 519 billion in the period 1995 to 2015 – equivalent to a compound annual growth rate (CAGR) of around 2.4 percent.

Global Chemical Industry Revenue 2015

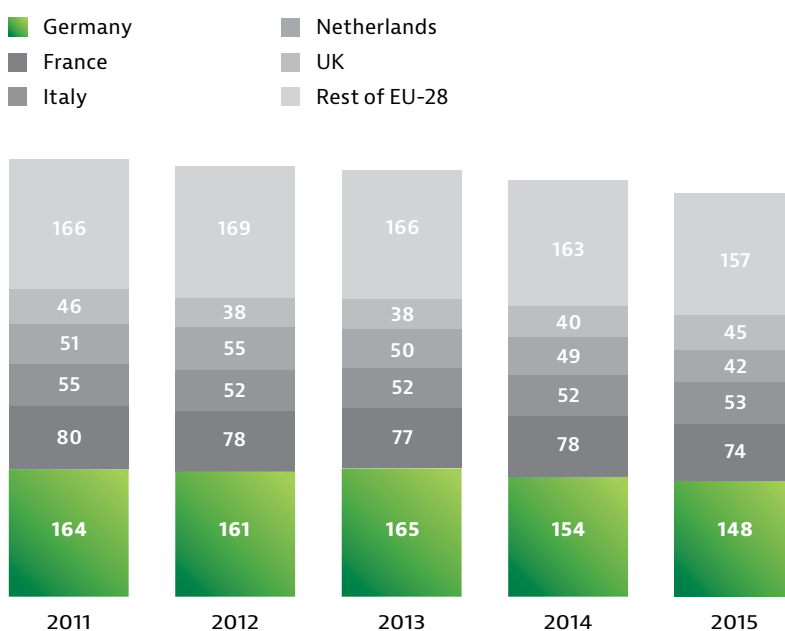
in EUR billion



Source: The European Chemical Industry Council (Cefic) 2016

European (EU-28) Chemical Industry Revenue

in EUR billion

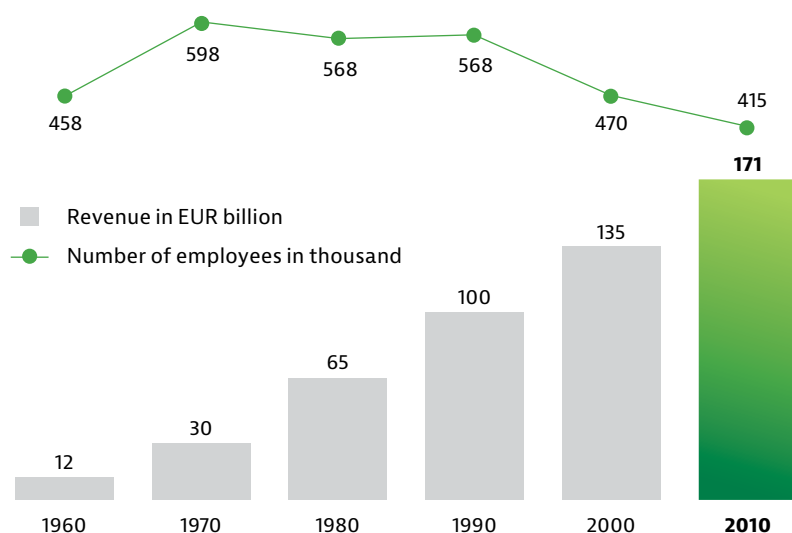


Source: German Chemical Industry Association (VCI) 2016

Growth Market Germany

During the period 1960 to 2010, chemical and pharmaceutical industry revenue in Germany increased from EUR 12 billion to EUR 171 billion – resulting in an average nominal growth rate of 5.4 percent per year (real growth rate: 3.1 percent per annum). Over the same period, the number of employees decreased from 458,000 to 415,000; increasing productivity sixteenfold as indicated by revenue per employee levels of around EUR 413,000 in 2010.

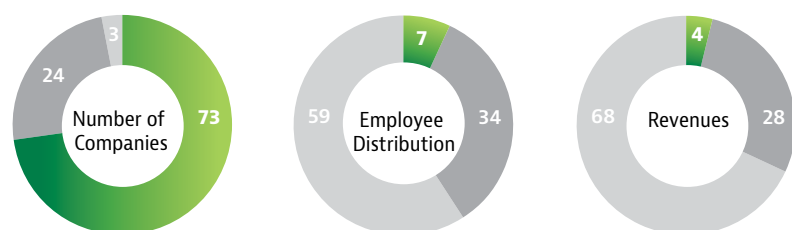
German Chemical Industry Revenue and Employee Development



Sources: Revenue and Number of employees: VCI; 1995 and 2008 new statistical classification; from 1991 on: 16 federal states; 1998 and 2003 new regional classification; Employees: from 2007 on month of reference September of each year; Rate of Inflation: Federal Statistical Office.

German Chemical Company Structure 2015 in percent

- 1-49 employees
- 50-499 employees
- >500 employees



Source: VCI 2016

Optimized Efficiency

Improved performance through increased productivity has led to a reduction in workforce size. It also serves as a guarantor for the continued existence of a successful and thriving chemical industry in Europe. Alongside the streamlined workforce, the shape of the production landscape has slowly altered due to the increased migration of the low-margin and high-volume petrochemical and parts of the basic chemical sectors out of Europe. As a result of this consolidation, chemical companies are increasingly focusing their activities in the high-tech and high-margin specialty and fine chemicals segments. Surprisingly, the German chemical company picture remains largely unchanged.

Stable SME Environment

There were nearly 3,300 chemical companies in Germany in 2013, of which 97 percent were SMEs (less than 500 employees). The country's globally renowned and highly innovative *Mittelstand* makes up the backbone of the chemical industry and generates around 30 percent of revenue with approximately one third of the workforce.

Major International Players

World-class company performance is imperative in the face of numerous global challenges. German companies have long been at the forefront in developing innovations and trends and continue to consolidate their global prominence. The country's top producers account for many globally active chemical companies; being headed up by such illustrious names as BASF, Bayer, Henkel, Evonik, Covestro, Merck, Lanxess, Freudenberg, Wacker, and Altana.

Healthy Growth

Since 2009, German chemical companies have continually improved their financial results. Almost all of the above-listed companies have growing sales numbers, double-digit earnings before interest and tax (EBIT) margins and consistently positive net margins. Their economic strength has also been reflected in a healthy dividend policy. Shareholders have received dividend payouts despite significant investments being made in production facilities, debt repayment and M&A activities. Dividend distribution rates have risen steadily since 2010, bearing comparison with the large stock indexes (e.g. DAX and S&P 500).

Europe's Manufacturing Hub

With around 11 percent of total manufacturing industry revenue in 2015, the chemical industry is the fourth-largest industrial sector in Germany after the automotive, mechanical engineering, and metal sectors. The attractiveness of Germany as a production location for the chemical industry is based on specific strengths of innovation, productivity and resource efficiency. In the latter respect, Germany's chemical companies were able to reduce their energy needs by 20 percent between 1990 and 2010 – with output over the same period increasing by almost 60 percent. A 40 percent growth in output – based on an absolute energy consumption increase of just eight percent – will be recorded by 2030 should this development continue over the next decade.

Basic Chemical Production Constant

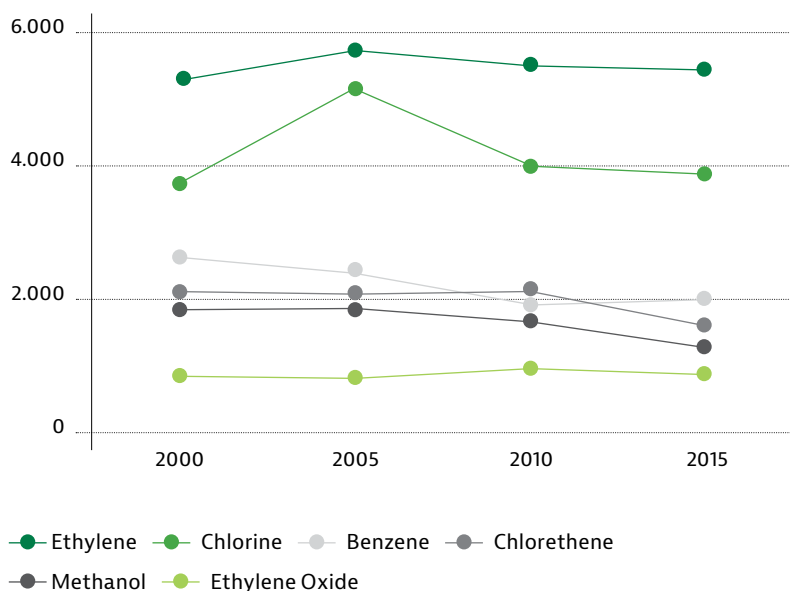
Production output of basic chemicals – including benzene, chlorine, and ethylene – has remained constant since 2000 as a result of continuous productivity improvements. Increased investment activity can be seen since the economic downturn in 2009. Contrary to popular belief, much of the investment is taking place in basic chemicals. The main drive for these investments is ensuring the global competitiveness of the respective facilities – which is why so many of the investments involve bringing the technology up to date. Equally, the attractiveness of the market defies the supposedly high energy costs, which can be deduced from the not insignificant amounts invested in chlor-alkali electrolysis, reflected by the almost constant production of chlorine at around 4,000 tons per year.

Stable Market Segments

As with the chemical industry itself, the sector's client industries have consolidated and strengthened the domestic market after the financial crisis. This can be best observed by the fact that the individual segments within the chemical industry have remained almost constant since 2010. As a result, fine and specialty as well as basic chemicals continue to constitute the backbone of the German chemical production market. It can be seen that German chemical companies in particular have developed their downstream activities. Downstream products are to be found at the end of the chemical value chain, generally being branded products sold to industrial consumers.

Basic Chemical Production Volume in Germany

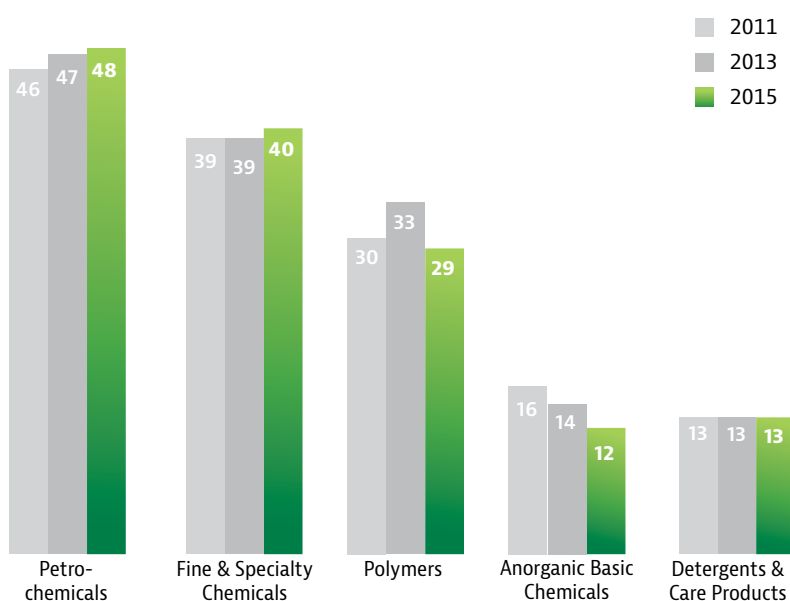
in tons



Source: VCI 2001-2016

Chemical Industry Market Segmentation by Revenues

in EUR billion



Source: VCI 2012-2016

European Export and Business Hub

Trading chemicals around the world promotes competition, develops new markets and stimulates production efficiency. The EU chemical industry in particular benefits from its historical export strength; registered by a solid recovery after the 2008 economic crisis and a record net trade surplus of around EUR 48 billion in 2013. This track record has been continued in 2014 and 2015 with trade surpluses of EUR 43 billion and EUR 45 billion respectively. A number of European countries belong to the world's leading export nations. They, like Germany, have maintained their strong position in recent years, whereby Germany accounts for around 70 percent of the EU export market.



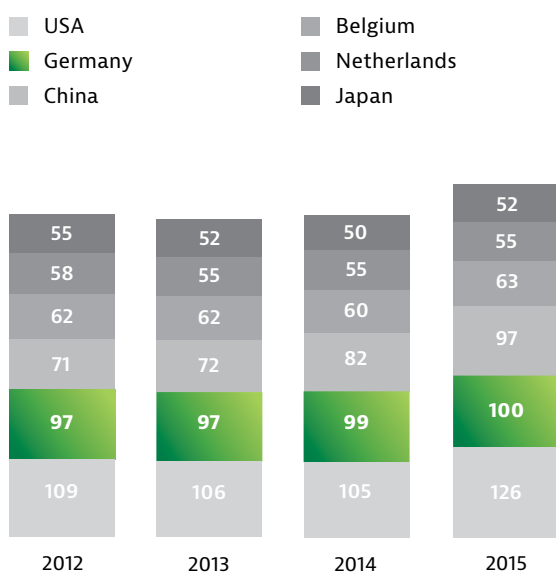
Germany is the world number two for chemical product exports

Germany – Strong Export Market

The historical export strength of the German chemical industry remained unaffected by the different developments experienced in the sector. In 2015, Germany was the world's second largest exporter of chemical products – with a value of around EUR 100 billion and global market share of 9.3 percent (being surpassed only by the US). While export levels have remained constant amongst most exporting countries, China alone records growth, albeit at a level significantly behind sales growth. This is a clear indicator that China is still a net chemical importer.

Top 6 Worldwide Chemical Industry Exports by Country

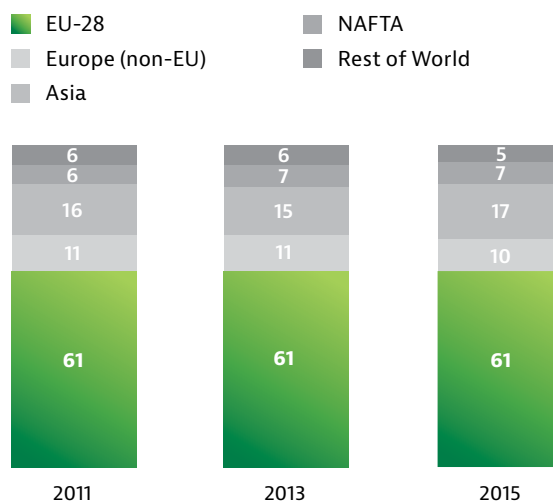
in EUR billion



Source: VCI 2013-2016

German Chemical Industry Exports by Destination

in percent



Source: VCI 2012-2016

Europe – Germany's Main Chemicals Customer

Germany's chemical industry exports around the globe. In 2015, more than 70 percent of German exports remained within Europe, while 12 percent and 10 percent were exported to Asia and North America (NAFTA) respectively. The four largest export countries were EU-28 countries: France (EUR 9.7 billion), the Netherlands (EUR 7.8 billion), Italy (EUR 7.2 billion), and Belgium (EUR 6.8 billion). By far the most important export countries outside Europe are the US (EUR 6.5 billion) and China (EUR 4.6 billion).

International Chemicals Business Hub

Germany is home to a number of the world's most prestigious chemicals, plastics and rubber industry trade fairs, making Germany an internationally leading chemicals business hub. As well as providing excellent business opportunities, visitors also have the chance to learn more about the latest state-of-the-art innovations and developments in the sector. Important shows include:

- European Coatings Show, Nuremberg (biennial)
- Analytica, Munich (biennial)
- ACHEMA, Frankfurt (triennial)
- K, Düsseldorf (triennial)
- Composites Europe, Düsseldorf (annual)

Reliable Workforce

According to the IMD World Competitiveness Yearbook 2016, German employee motivation levels are greater than those of their counterparts in China, Russia, Poland, France, and the US. This can be derived from the fact that Germans work more than their international peers (41.2 hours per week) and lose less days per annum to industrial action than other market-determining European nations. There were a total of 19 strike days per thousand employees in the seven-year period between 2009 and 2015 – exactly half of the European average. This small number of days lost means that Germany experienced just one fifth and around one eighth of outages in Belgium and France respectively during the same period. The high level of workforce satisfaction is also borne out by the fact that the last strike action in the chemical industry took place in 1971. This also reflects the good cooperation between the IG BCE trade union and companies in the sector.

Stable Labor Costs

The labor cost gap between Germany and its eastern European neighbors has been significantly reduced. Since 2006, wages have risen in most European countries (EU-28) with a growth rate averaging 2.5 percent. While some countries – particularly those in Eastern Europe – experienced a rise of close to or more than five percent, Germany recorded one of the lowest labor cost growth rates at just two percent.

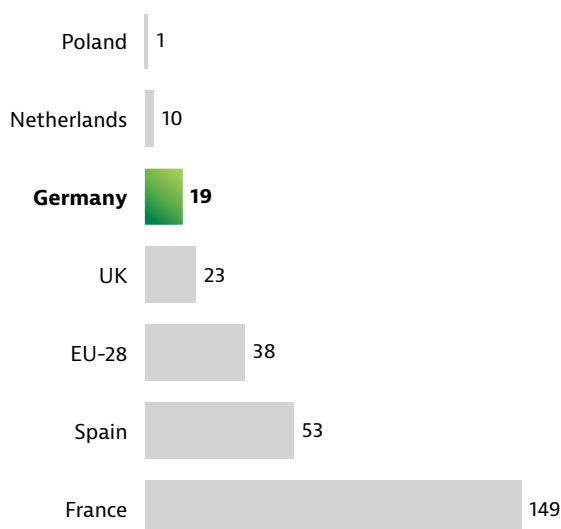
Academic Excellence

The chemicals industry has responded to the growing pressure to be innovative by significantly increasing the number of academics in the overall workforce over the past few decades. Today, nearly every seventh employee has an academic background – compared to less than one in 10 in the 1980s and around one in eight employees in the 1990s.

Germany's excellent university training provides the basis for the development of future-proof and innovative new products in the chemicals industry. A decline in the general population notwithstanding, the number of students embarking on chemistry studies has steadily increased. Germany has the highest share of university students in the sciences, mathematics, computer sciences, and engineering in the EU (37 percent of all students), where the number of new chemistry students has increased from around 6,000 in 2005 to 7,000 in

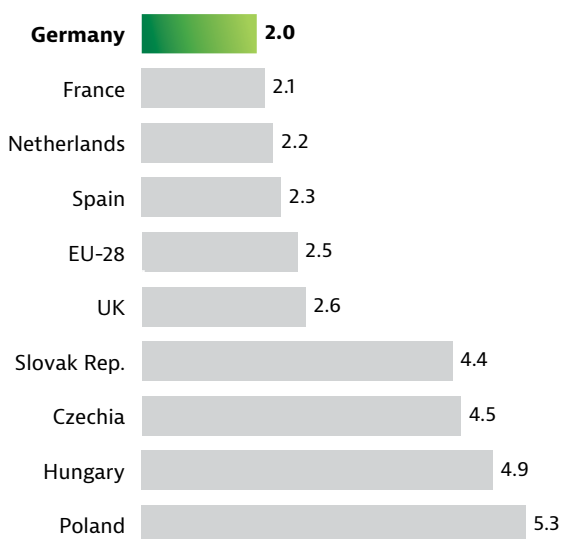
2015, the number of doctoral students has risen from 5,000 to well over 8,000 during the same period. Similarly, the number of doctoral graduates available to the industry each year exceeds the 2,000 mark for the first time since 2000.

Days not Worked due to Industrial Action per 1,000 Employees 2009-2015



Source: European Trade Union Institute 2016

Labor Cost Growth in Business Economy 2006-2015



Note: Annual average growth in percent
Source: Eurostat 2016

Germany's Research Strategy

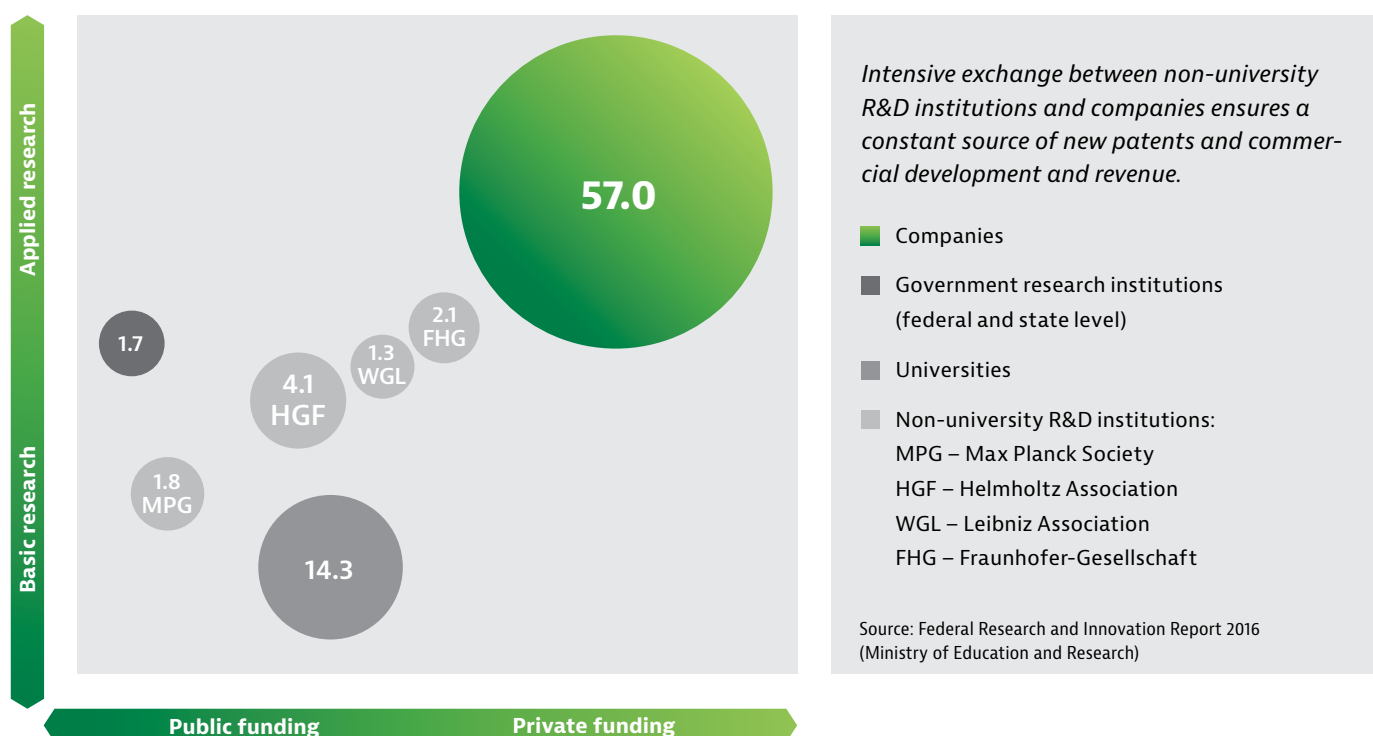
Germany is Europe's biggest research spender, with total research and development (R&D) expenditure of around EUR 84 billion in 2014. During the 20-year period 1994 to 2014, R&D spending rose from around EUR 40 billion to EUR 84 billion – equivalent to an average annual growth rate of around 3.8 percent. Growth in the period 2013 to 2014 was EUR 4 billion; taking R&D spending up to the EUR 84 billion mark. This is equivalent to almost 2.9 percent of gross domestic product and just below the EU goal of three percent as set out in the Europe 2020 strategy. The industry sector is responsible for the largest share of R&D spending, with companies responsible for 70 percent (EUR 57 billion) of R&D expenditure. The federal government accounts for 17 percent (EUR 14.3 billion) of spending, most of which is allocated to universities and non-university research institutions like the Leibniz Association. More than 600 thousand people were employed in R&D in 2014 – equivalent to around 20 percent or 100 thousand more people than in 2000.

Applied Chemical Research

Germany is home to four globally renowned non-university research organizations that are active in dealing with the challenges posed by future chemical issues. These are the Max Planck Society (13 institutes), Fraunhofer-Gesellschaft (6 institutes), Helmholtz Association (4 institutes), and the Leibniz Association (5 institutes). They are autonomous and able to respond to the dynamic changes and demands of the industry thanks to their financing structure. Quality assurance through peer review and patent marketing units ensure basic research at the highest international level. They all undertake applied research that drives economic development and creates benefits for society. The majority of their respective workforces are scientists and engineers, with most of their budgets being generated by contract research for industry. Thanks to international collaborations with excellent research partners combined with a focus on the key chemical technologies of the future, German applied research institutes play a prominent role in the European innovation process.

R&D Expenditure and Type of Research by Actor 2014

in EUR billion



Chemical Industry R&D Spending

Commercial innovation is becoming increasingly important for the competitiveness of individual regions. However, the ratio of R&D spending to sales (R&D intensity) within the chemical industry has remained almost unchanged since 2005. Japan's R&D intensity (2005 - 4.4 percent; 2015 - 4.0 percent) level is more than double that of the EU (2005 - 1.7 percent; 2015 - 1.8 percent) and the US (2005 - 1.8 percent; 2015 - 1.7 percent) over the same period.

Europe's Chemical Innovation Hub

As the largest chemicals market in Europe, Germany has one of the highest R&D intensity levels in Europe, with 2.8 percent spending in 2015 making it the continent's innovation hub. Chemical industry R&D expenditure for developing new products is traditionally very high. In 2015, industry R&D expenditure was EUR 4.4 billion, making the sector the fifth strongest R&D industry after renowned industries like the automotive, electrical engineering, mechanical engineering, and pharmaceuticals sectors.

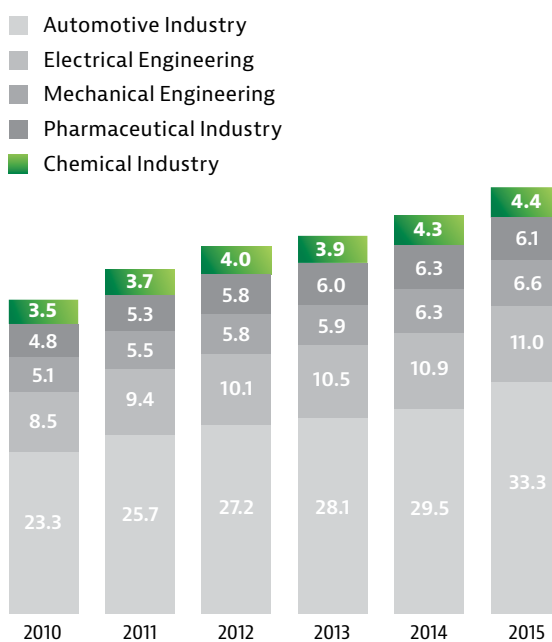
Innovation Meets the Market

The combined efforts of Germany's research strategy and the applied research conducted by both research institutions and companies alike has allowed the country to consolidate its number two spot for European chemical patent registrations behind the US. Within Europe, Germany is the leading innovation hub, maintaining high productivity with the newest technologies at its production facilities in a stable market.

Global Megatrends

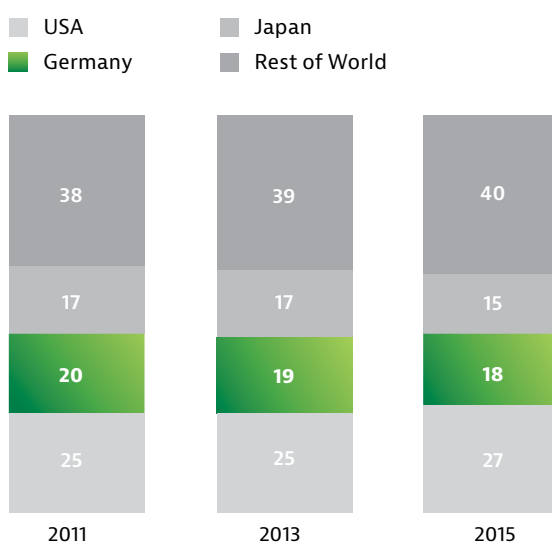
Although chemical companies do not expect as many breakthroughs and radical innovations in products, it nevertheless remains the top innovation priority. In a product-driven environment this makes sense, but the priority accorded to individual products has been changing in recent years. Many industry actors are seeking to grow their business in the area of global megatrends (e.g. energy transition, intelligent mobility, and agriculture and nutrition). Chemical companies are spending large sums of their R&D budgets in future-driven projects in areas as diverse as lithium-ion battery materials, high-purity silicon for solar panels, and biotechnological processes for the post-oil economy.

R&D Expenditure in Germany by Industry in EUR billion



Source: VCI 2011-2016

Chemical Patents Granted by the European Patent Office by Source Country in percent



Source: European Patent Office 2012-2016

Chemical Parks

As a chemical production and associated process industries location, Germany is a global heavy-weight, ranking first in Europe. Global players already have a significant production base in the country and continue to invest here. Years of investment and production optimization have resulted in a network of highly integrated production sites: Germany's unique "Chemical Parks." These are linked by advanced infrastructure with first-class energy supply, offering service provision through site management companies whose core business is the on-site supply of utilities. With their plug and play concept, Germany's chemical parks are able to offer state-of-the-art conditions for international investors. They can choose the services from a site operator that suits their business model best. The new production site, developed sites and site security services are all made available for the investor's core activities. Optional services such as warehousing, logistics, and analytics can also be requested as needed. German chemical parks increase cost effectiveness by splitting cost and overhead – a benefit to both the site operator/owner and investor.

Supporting Different Business Models

Chemical parks offer a wide range of business models. Subject to the investor's individual requirements, land can be leased or purchased in order to establish a production unit. At the other end of the scale, a site operator invests in and operates the new plant for the investor on a custom or toll manufacturing basis.

- + *Cost-competitive production through flexible site operators*

Planning Support Services

Investors are supported by a number of investment planning and construction services. The most sought-after service is for permit applications. Licensing procedures are completed quickly and efficiently with the competent public authorities assisting in the process from a very early stage.

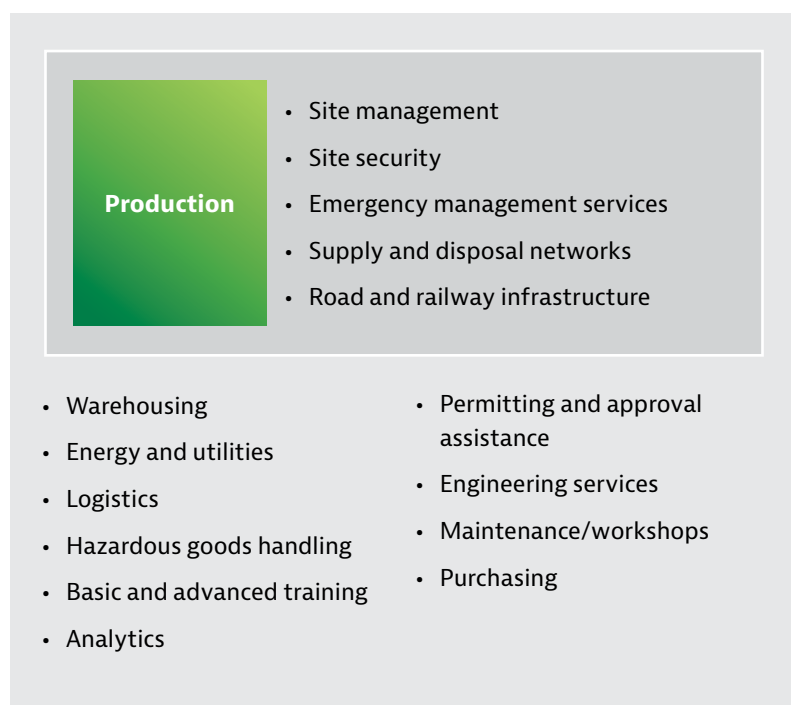
- + *Fast implementation of the new business*

Provision of Utilities and Services

Services such as wastewater treatment, thermal treatment of production residue, emergency services, industrial safety, fire protection, environmental services, analysis and testing services, rail dispatching, and product storage are all widely available at chemical parks.

- + *All chemical services available on-site*

Plug and Play Production Concept



Powering Chemical Parks

Secure power supply is imperative for profitable industrial plant operation. Chemical parks are made secure through the provision of a number of redundant supply lines. Most chemical parks operate their own on-site power plants in order to secure supply. An undisrupted supply of steam and overall energy cost are also key success factors. By generating both heat and power from various primary energy sources, chemical parks are well placed to utilize the high efficiencies found with combined cycle heat and power (CHP) generation. Plants within any one chemical park are linked to duplicate transmission networks that ensure stable supply in the case of disruption of one line. Supply by two independent systems ensures continuity even in the event of random acts of nature. This power supply set-up makes chemical parks ideal sites for investors in the process industries.

- + *Secure power supply*

Chemical Infrastructure

The country's chemical complexes are served by excellent logistics networks – from road and rail to waterway and pipeline. Investment is being made all the time to improve provision across the existing logistics infrastructure.

Pipelines

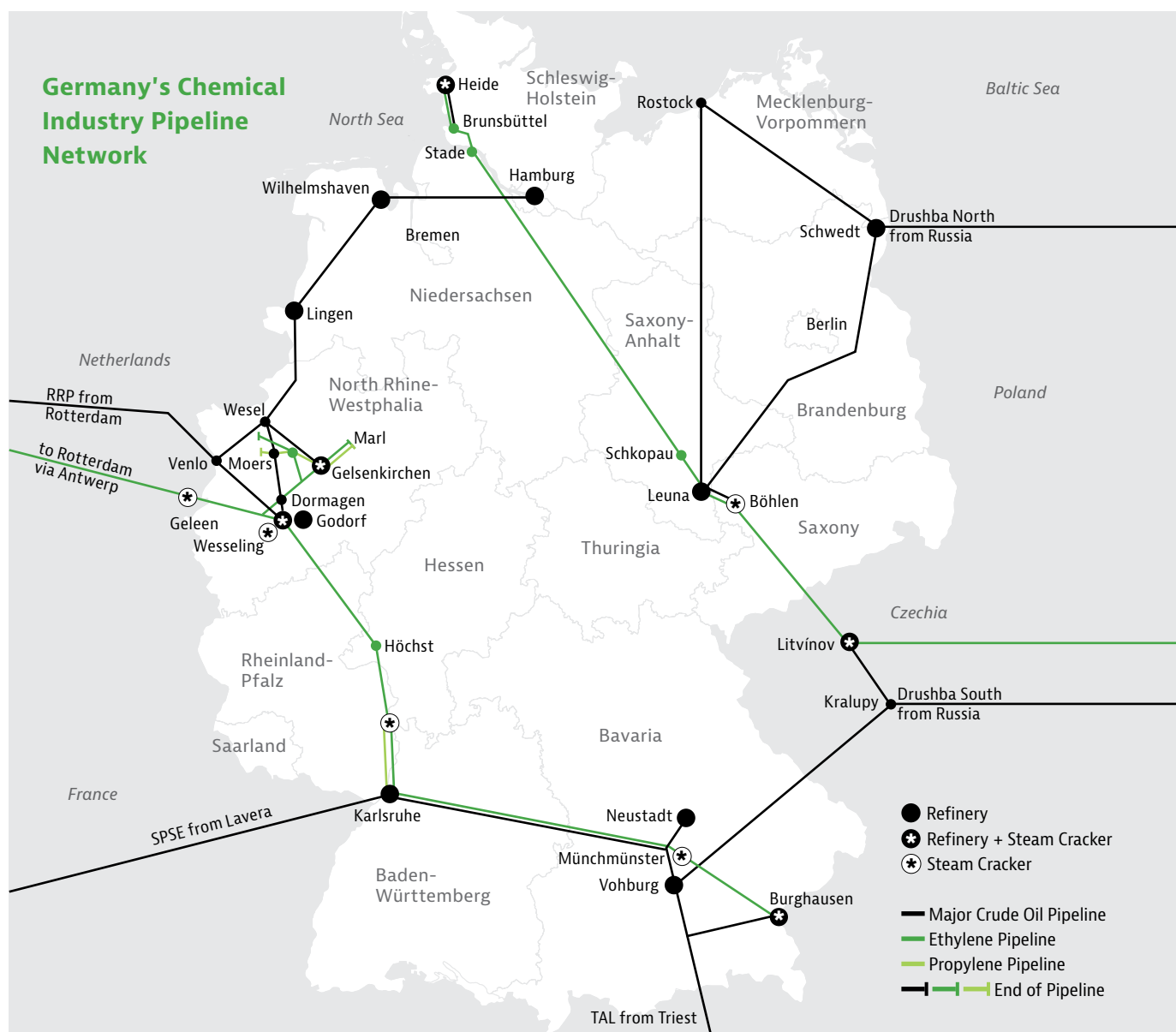
Around one third of chemicals are transported by pipeline. Major chemical sites are interconnected through an advanced network of pipelines transporting raw materials such as propylene, ethylene and crude oil. Thirteen refineries and eight steam crackers supply Germany's chemical industry with all of the necessary building blocks for organic chemistry.

Road and Rail

The country's highway system has one of the highest highway kilometer-density levels in Europe. Germany's high-speed railway network is the eighth largest in the world – its 37,860 km of railway track being almost enough to circle the globe – and connects Germany with its nine neighboring countries.

Waterways

Among the highlights of the country's network infrastructure are Europe's second largest port measured in container port traffic (Hamburg) and Europe's largest port container terminal (Bremerhaven) and over 250 inland ports.



Energy Security

Security of energy supply is a crucial factor in the energy-intensive chemical industry; particularly when choosing an investment location and determining the market prospects of any planned facility.

Low Power Outages

The security of Germany's electricity supply is very high by international standards. Unlike some countries in Europe where major blackouts are recurrent, power outages are definitely the exception in Germany. In 2014, the amount of time lost due to unplanned interruptions in Poland was around three hours, around two hours in Czechia and approximately one hour in Spain. Both Italy and the UK suffer from outages of around 100 minutes per year. These all exceed the most stable grids in Denmark, Switzerland and Germany with losses of just 12, 13 and 14 minutes per year in 2014 respectively. The situation for unplanned interruptions is similar. Countries with outages longer than an hour also have at least one unforeseen failure. Conversely, the level of unplanned interruptions in those countries with stable networks – where outages are usually planned – is significantly below 0.5 times a year.



Germany's secure power supply ensures chemical industry success

Nord-Stream-Pipeline:

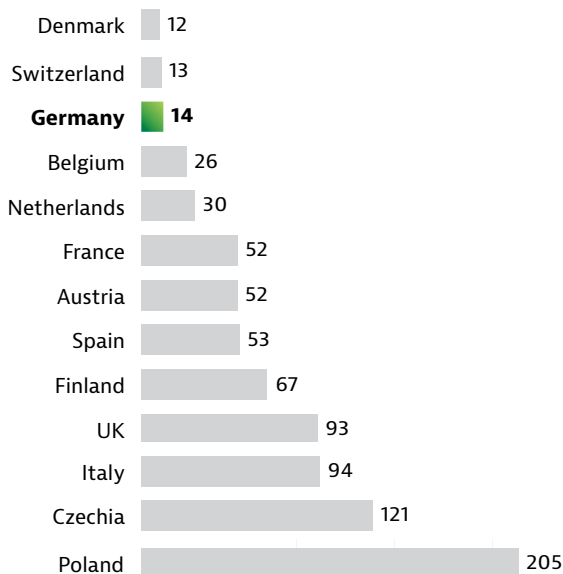
Natural Gas Direct from Russia

The Baltic pipeline from Wyborg in Russia to Lubmin in northeast Germany – with a length of more than 1,200 km – has helped establish Germany as the hub for Russian gas in Europe since 2011. Germany will also become Europe's preeminent trading market for natural gas, with an additional capacity of 55 billion m³ per year.

Diversity of Supply

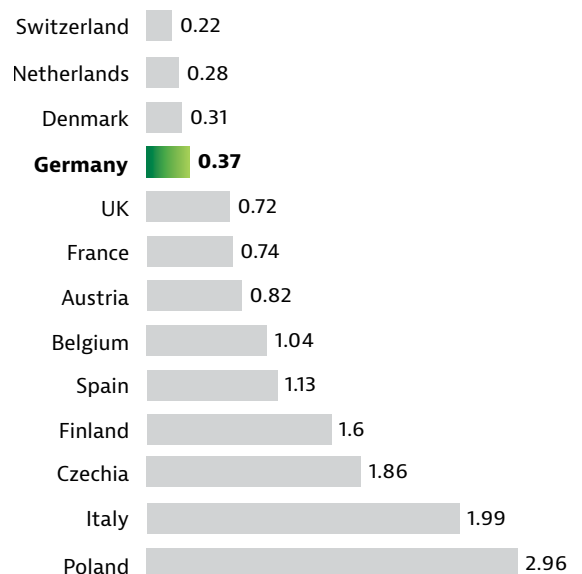
Germany has to rely on imports for around 40 percent of its energy supply – a situation similar to that of many other industrial countries. However, in marked contrast to its counterparts, Germany's energy mix is very broadly diversified, resulting in secure energy supply. Lignite and hard coal account for around 50 percent of electricity generation, followed by nuclear power (20 percent) and natural gas (10 percent). Renewable energies already account for 19 percent of Germany's energy mix. This share has been increased from 3 percent to 19 percent in the period 1995 to 2015.

Minutes Lost to Power Outages 2014



Source: Council of European Energy Regulators (CEER) 2016

Interruptions per Year 2014



Source: Council of European Energy Regulators (CEER) 2016

Attractive Investment Location

Germany's greatest appeal for chemical companies lies in its market size within Europe. This is largely due to the presence of strong client industries including the automotive sector. The country's historical export strength and research environment are also attractive factors. Specific strengths in innovation, productivity and resource efficiency all help establish Germany as an attractive chemical industry production location. These factors, together with sensible labor market reforms, have led the German chemical industry being able to consolidate its market-leading position in Europe since the economic crisis of 2008. This is best evidenced in the strong increase in foreign direct investment and M&A activity.

Europe's FDI Leader

In line with the seemingly limitless growth of China's chemical market, investment in China continues apace. The investment volume in China increased fivefold to more than EUR 130 billion during the period 2006 to 2012, thus surpassing the entire chemical investment from the "rest of the world" in 2012 almost twice over.

However, since the economic downturn in 2008 increasing investment activities can also be seen in the mature European market. The main driver for these investments, in contrast to the investments in new plants in China, is ensuring the global competitiveness of the respective facilities, which is why so many of the investments involve bringing the technology up to date. Investment levels within Europe were comparable to the size of the respective markets. As such, most investment for the period 2011 to 2015 occurred in Germany, followed by the UK, France and Spain (who account for less than half of total investment levels).

Profitable M&A Activity

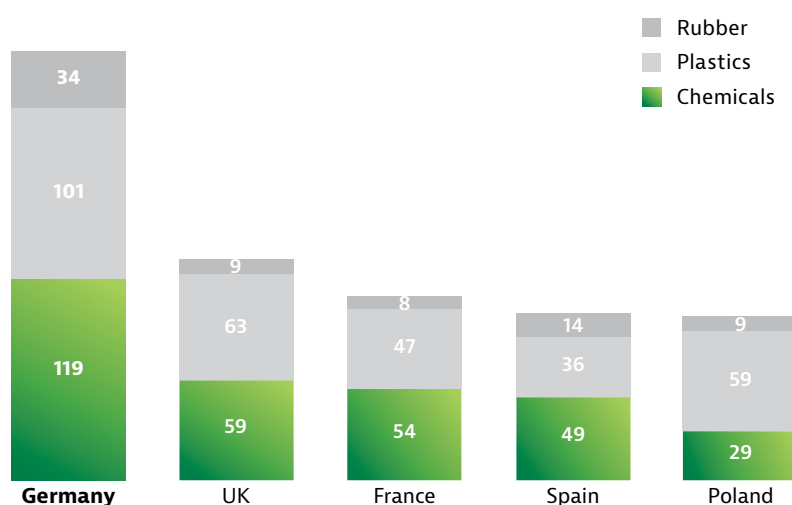
Since the drop in sales in 2009, German chemical companies have been financially well positioned and seeking investment activity in growth segments with the lowest level of cyclical behavior. The dazzling level of capital available today, particularly for those German chemical companies with investment grade status, has led them to aggressively seek out new growth segments. As such, the last decade has seen several multibillion dollar deals in the chemical and pharmaceutical sector. Germany-based Merck KGaA acquired

US-based research chemicals company Sigma-Aldrich for USD 17 billion. Germany's Bayer has stood out, especially for pharmaceutical and agricultural acquisitions, in the past years. The company integrated US-based Merck & Co's over-the-counter (OTC) business for USD 14 billion in 2014 and is set to acquire Monsanto for USD 66 billion in 2017.

Beyond the pharmaceutical segment, specialty chemicals are playing a major role. Germany's BASF in particular has made a number of major investments. In the past 10 years these have included over USD 5.2 billion in US-based Engelhard (well-known for its expertise in catalysts); EUR 2.7 billion in the construction chemicals business of Degussa (now Evonik); more than CHF 6.1 billion in Ciba Specialty; EUR 3.1 billion for Cognis in 2010; and, most recently, USD 3.2 billion for Chemetall in 2016.

On the other hand, a number of chemical companies have offloaded products and business units whose margins have declined in recent years. These were often large-volume products such as styrene (BASF divesting Styrolution JV to INEOS) or titanium dioxide (Rockwood selling to Huntsman).

Top 5 Chemical Industry FDI Destinations in Europe 2011-2015
number of projects



Source: fDi markets 2016

Germany Trade & Invest Helps You

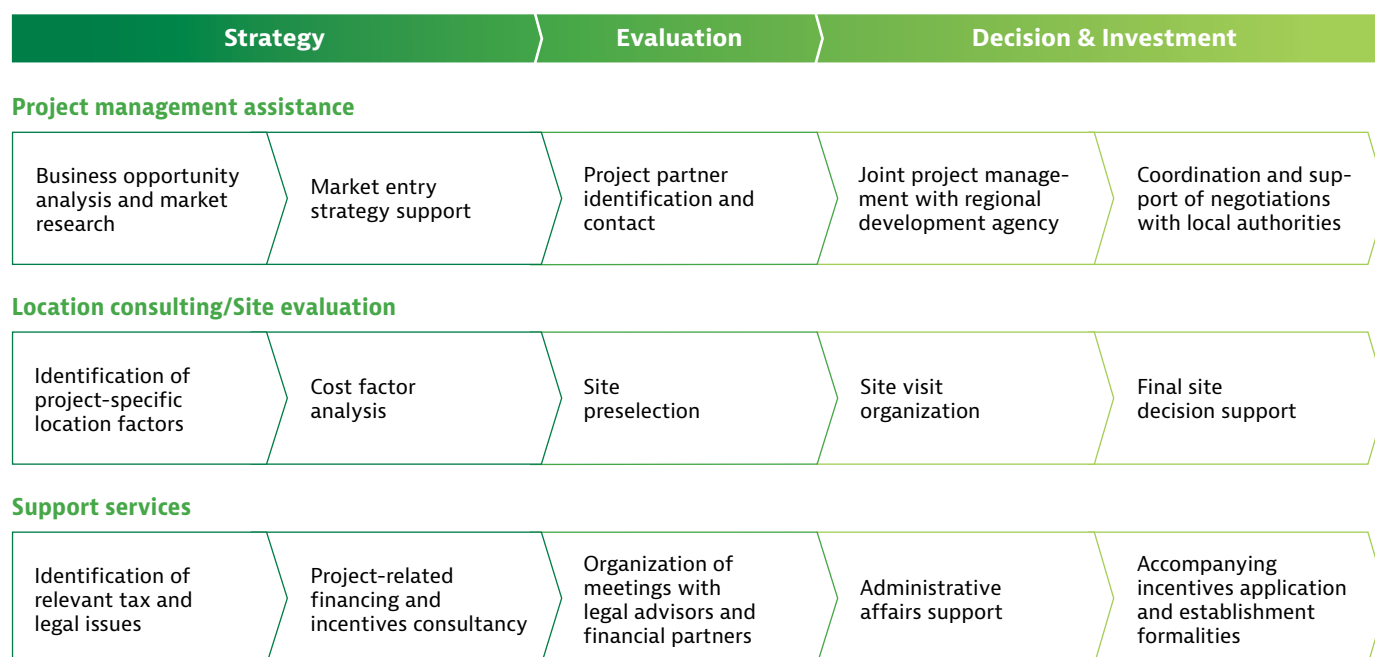
Germany Trade & Invest's (GTAI) teams of industry experts will assist you in setting up your operations in Germany. We support your project management activities from the earliest stages of your expansion strategy.

We provide you with all of the industry information you need – covering everything from key markets and related supply and application sectors to the R&D landscape. Foreign companies profit from our rich experience in identifying the business locations which best meet their specific investment criteria. We help turn your requirements into concrete investment site proposals; providing consulting services to ensure you make the right location decision. We coordinate site visits, meetings with potential partners, universi-

ties, and other institutes active in the industry. Our team of consultants is at hand to provide you with the relevant background information on Germany's tax and legal system, industry regulations, and the domestic labor market. Germany Trade & Invest's experts help you create the appropriate financial package for your investment and put you in contact with suitable financial partners. Our incentives specialists provide you with detailed information about available incentives, support you with the application process, and arrange contacts with local economic development corporations.

All of our investor-related services are treated with the utmost confidentiality and provided free of charge.

Our support services for your investment project



Investor Consulting

Dr. Thorsten Bug is the senior manager responsible for the chemical industry in Germany Trade & Invest's Chemicals & Healthcare team within the agency's Investor Consulting division. An acknowledged industry expert, he has advised numerous international chemical companies seeking to set up operations in Germany since joining the agency in 2008. Dr. Bug, who completed his doctoral thesis on the "Nucleophilic reactivity of diazo compounds and stabilized carbanions" in Munich in 2003, was also active as a senior asset management consultant for five years prior to taking up his current position.

Projects successfully supported to date cover the complete chemical industry value chain and include the establishment of sales office operations, production and R&D facilities as well as pilot plant investments across Germany. The list of international investment project clients who have benefited from Dr. Bug's advisory and consultancy services to date includes Brazilian petrochemical, Japanese chemicals and plastics, and North American adhesives companies.

For questions on how to establish your chemicals business in Germany, please contact Thorsten Bug at **thorsten.bug@gtai.com**

For more information about the chemicals industry in Germany, please visit our website **www.gtai.com/chemicals**

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The background of the entire page is a grayscale photograph of laboratory glassware. In the foreground, a large Erlenmeyer flask is partially filled with a liquid, with measurement markings of 100, 150, 200, and 250 visible. In the background, a graduated cylinder is also visible, containing a liquid. The overall image has a soft, out-of-focus quality.

About Us

Germany Trade & Invest (GTAI) is the economic development agency of the Federal Republic of Germany. The company helps create and secure extra employment opportunities, strengthening Germany as a business location. With more than 50 offices in Germany and abroad and its network of partners throughout the world, GTAI supports German companies setting up in foreign markets, promotes Germany as a business location and assists foreign companies setting up in Germany. All investment services and related publications are free of charge.

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