Agenda

1. The Chemical Industry Globally
2. The German Chemical Industry
3. Opportunities for Chemicals Producers in Germany

Main sources:
- VCI: Verband der chemischen Industrie (engl.: German Chemical Industry Association), Frankfurt/Main, www.vci.de
Global chemical revenue
With strong growth rates in the 10-years-period 2006-2016, the Asian Chemical Industry has doubled their share in global revenues.

Quelle: Cefic, Facts and Figures 2017

2006: EUR 1,803 billion
2016: EUR 3,360 billion
Global Chemical Revenue

Despite China’s strong growth, Europe continues to be a relevant market.

2006: EUR 1,803 bn
EUR 573 bn (32%)

2016: EUR 3,360 bn
EUR 598 bn (18%)

CAGR = 0.4%

Quelle: Cefic, Facts and Figures 2017

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Global Chemical Revenue
Germany is the world’s third largest chemical market, being surpassed only by China and USA in terms of revenues.

Chemical Revenue in EUR billion, 2016


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European Revenues
With a share of 29% in 2017, the German chemical industry has consolidated its leading role in Europe during the recent years.


Quelle: VCI, Chemiewirtschaft in Zahlen 2018 (Table 60b)
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The History of the German Chemical Industry
Within 50 years, revenues increased by a nominal 5.4 % (real 3.1%) on average a year. This resulted in a 14-fold productivity increase.

Revenues and Number of Employees of the German Chemical and Pharmaceutical Industry, 1960-2010

From 1991 Germany reunified.
German Chemical Companies Structure

The industry is “dominated” by small companies, whereas the lion’s share of revenues are raised by large corporations.

Number of Chemical Companies, Employees and Revenues by Company Size, 2017

Source: VCI, Chemiewirtschaft in Zahlen 2018, Table 18b.
Chemical Exports

Germany is the second largest exporter of chemicals globally.

Chemical Exports by Country in EUR billion, 2017

Source: VCI, Chemiewirtschaft in Zahlen 2018, Table 61b.
German Chemical Exports

European countries are dominating German Chemical Exports.

Source: VCI, Chemiewirtschaft in Zahlen 2017, Table 42b.
Chemical Market Segmentation

Fine and specialty as well as basic chemicals continue to constitute the backbone of the German chemical production market.

Chemical Market Segmentation by Revenues in EUR billion, 2010–2017

Source: VCI, Chemiewirtschaft in Zahlen 2017 (Table 15a)
German Chemicals Production

Despite the economic downturn in 2009, the Basic Chemicals output in Germany remained almost steady since 2000.

Production Volumes of Basic Chemicals in Germany, 2000–2015

Source: VCI, Chemiewirtschaft in Zahlen 2016, Table 4a and 4b; Oxygen in million m³ under normal conditions.
Germany’s private R&D spending

German chemical industry R&D expenditure was EUR 4.2 billion in 2017, making the sector the fifth strongest in Germany.

R&D Expenditure by Industry, 2006–2017

Source: VCI: Chemiewirtschaft in Zahlen 2018 (Table 48)
Chemical Patents

Germany is number three spot for European chemical patent registrations, only surpassed by the US and Japan.

### European Chemical Patents granted by the EPO by Source Country in %, 2007–2017

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*Source: European Patent Office (EPO)*
Electricity generation
In the last 25 years Germany got “greener” as Renewables has grown from 2% up to 19%. Nuclear energy decreased by 1/3 in the same period.

Electricity Generation in Germany by Energy Carrier in %, 1990–2015

Source: AG Energiebilanzen e.V. (http://www.ag-energiebilanzen.de/)

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www.gtai.de  16
Investments in Europe
Thanks to market attractiveness, most chemical investments in Europe for the period 2013 to 2017 occurred in Germany.

Number of Investments in Europe, 2013–2017

Quelle: fDi markets. Total number of investments (1,440): Chemistry (696), Plastics (576), Rubber (168). Graph represents 89% of all investments.
Chemical Cluster offer added value to their members:

- as networking platform for R&D institutes, companies, and authorities within the region
- through strategic alliances with international chemical sites in Europe, Asia and the US
- strengthen the cluster members’ global competitiveness
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• VCI: Verband der chemischen Industrie (engl.: German Chemical Industry Association), Frankfurt/Main, www.vci.de
Raw Materials Supply

Germany’s chemical industry regions are well connected to the European pipeline grid.

Infrastructure of raw materials supply:
- Crude oil via pipelines from:
  - Russia
  - the Mediterranean Sea
  - France
  - the North Sea
- Crude oil processing via:
  - 14 refineries
  - 8 steam crackers
- Pipelines for:
  - ethylene and propylene
  - natural gas
  - hydrogen
  - carbon monoxide
Phletora of Logistics

Additionally to the pipeline grid, Europe’s longest autobahn, rail and waterway network connects Germany with its nine neighboring states.

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<th>Mode</th>
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</table>
Chemical Parks „Plug & Play“ concept

Chemical Parks – Advantages:
• About 30 chemical parks offer cost-efficient and unique benefits through:
  – excellent infrastructure
  – chemical raw materials via pipelines
  – gases and steam via pipelines
  – secure energy supply
• Site operators offer expertise and services from one source
• Investors choose the services from site operator that suits their business model best

Source: Factsheet „Chemical Parks in Germany“, Germany Trade & Invest, February 2017
Chemical Parks – Selected Locations
Chemical Parks – Selected Locations

Germany’s Chemical Industry Pipeline Network

- Refinery
- Refinery + Steam Cracker
- Steam Cracker

- Major Crude Oil Pipeline
- Ethylene Pipeline
- Propylene Pipeline
- End of Pipeline

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Chemical Parks – Selected Locations