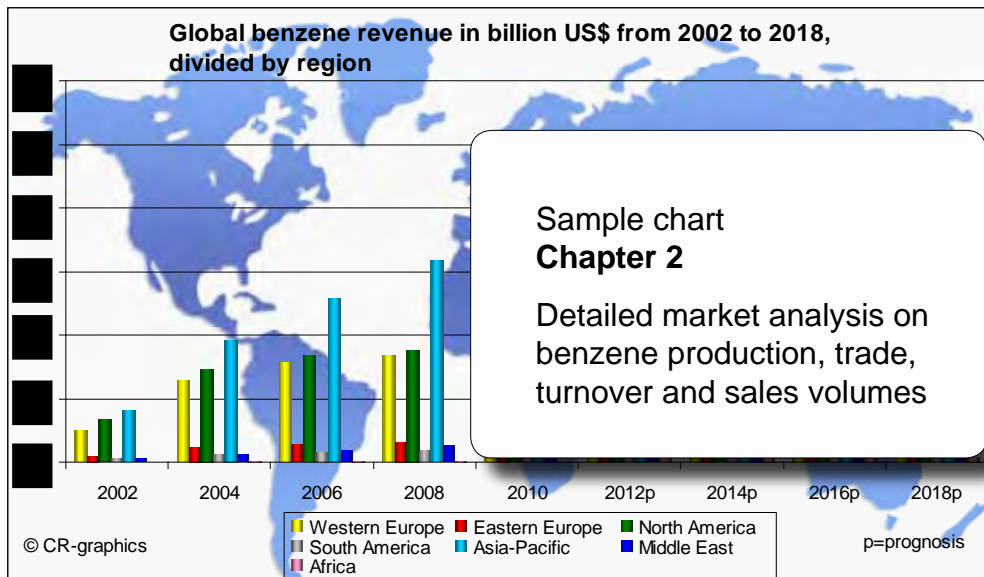


Market Study: Benzene



**Ceresana
Research**

Market Study: Benzene



The market research institute Ceresana forecasts dynamic growth in the global demand for benzene. Demand will increase by approximately 6 million tonnes by 2018. Massive capacity expansions planned by manufacturers of benzene and its downstream products in the Middle East and Asia-Pacific are of crucial importance to the development of the global benzene market. Benzene revenues will substantially exceed the 2007 peak level as soon as in 2011. Accordingly, the benzene market will most likely value US\$ 52.6 billion in 2018.

China and the Middle East Continue to Move Forward

The production of and demand for benzene in the Middle East register the greatest increases worldwide. Ceresana Research expects that the Middle East will see its share of the global supply and demand expand by 3.7 and 3.3 percentage points, respectively, until 2018. However, the Asia-Pacific region will continue to dominate the market and account for almost half of the global demand. China is rising to become the world's greatest benzene consumer and will most likely displace the U.S. to the second place in 2014.

Ethylbenzene Producers Are the Principal Customers

Benzene is a colorless liquid needed as a precursor for the chemical synthesis of many compounds,

mainly ethylbenzene, cumene, cyclohexane, nitrobenzene, and alkylbenzene. In addition, benzene is used as an extracting agent, solvent, laboratory chemical, and additive in gasoline. The most important buyers of benzene include producers of ethylbenzene, who account for more than half of all production. Ethylbenzene is primarily used to produce styrene, which is, in turn, mainly processed to polystyrene and EPS. Ceresana Research anticipates that ethylbenzene producers will continue to expand their share of all demand for benzene by 2018.

Essential Precursor for the Plastic Industry

The production of cumene is the second-largest benzene market, followed by cyclohexane. Cumene and cyclohexane producers account for approximately 20% and 11.4%, respectively, of the global demand for benzene. Cumene is mainly used to manufacture phenol and acetone, and is therefore also a precursor for bisphenol A, phenol resins, caprolactam, and methyl methacrylate. Cyclohexane is primarily used in the production of nylon fibers, which are processed into textiles and engineering plastics. Further applications of benzene are in the production of nitrobenzene, aniline, alkylbenzene, maleic anhydrides, and chlorobenzene.

The Study in Brief

Volume I, chapter 2 begins with a presentation and analysis of the benzene market – including forecasts up to 2018: Demand, production, imports, exports, revenues, and prices are analyzed. In addition, the study offers a comprehensive insight in the development of individual regions and global market dynamics. In chapter three, 35 countries are analyzed in detail: Demand divided by application as well as production, capacities, trade, and their influencing factors. Chapter 4 provides analyses of the demand for benzene worldwide and in the 7 regions of the world (Western Europe, Eastern Europe, North America, South America, Asia-Pacific, Middle East, and Africa). The application areas ethylbenzene, cumene, cyclohexane, alkylbenzene, nitrobenzene, and others are examined in detail.

Volume II is a useful list of manufacturers: 143 profiles of benzene producers – clearly arranged according to contact details, financial key data, product range, production sites, associated companies, profile summary, technologies, licenses, as well as current and planned production plants and capacities.

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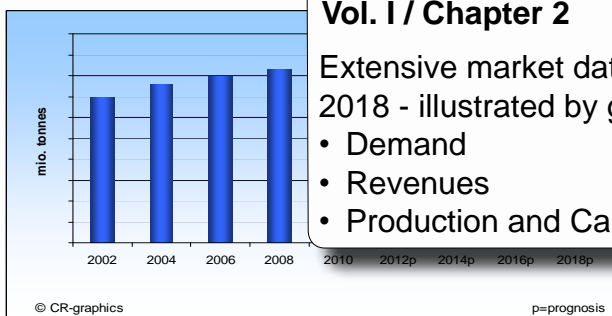
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2.3.1 Demand – Eastern Europe

The demand for benzene in Eastern Europe totaled approximately X million tonnes in 2002. This volume rose to X million tonnes by 2010, translating to a X% annual growth (Graph). We expect the demand in Eastern Europe will continue to increase at an average annual rate of X% over the next eight years. As a result, demand is anticipated to amount to approximately X million tonnes of benzene in 2018.



Vol. I / Chapter 2

Extensive market data from 2002 to 2018 - illustrated by graphs and tables:

- Demand
- Revenues
- Production and Capacity

Graph: Demand for benzene in Eastern Europe from 2002 to 2018, in million tonnes

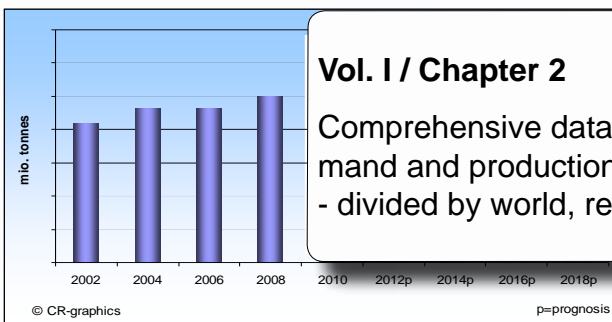
Country	Share in 2002	Share in 2010	Share in 2018
Russia	X%	X%	X%
Czechia	X%	X%	X%
Poland	X%	X%	X%
Romania	X%	X%	X%
Belarus	X%	X%	X%
Slovakia	X%	X%	X%
Ukraine	X%	X%	X%
Hungary	X%	X%	X%
Bulgaria	X%	X%	X%
Total	100%	100%	100%

Table 1: Various countries' shares in Eastern European demand for benzene from 2002 to 2018

3.4.2.2 Production and Capacities – Brazil

Production

About X million tonnes of benzene were produced in Brazil during the year 2002 (Graph). Production increased to somewhat less than X million tonne by 2010, which corresponds to X% of all South American production. Following an average increase of X% per year between 2002 and 2010, we anticipate seeing continued growth of X% annually over the next eight years. Accordingly, production in Brazil will most likely rise to X million tonnes by 2018.



Vol. I / Chapter 2

Comprehensive data and facts on demand and production from 2002 to 2018 - divided by world, regions, and countries

Graph: Production of benzene in Brazil from 2002 to 2018

Capacities

Brazil's benzene capacity was more than X million tonnes in 2010 (Table)

Company	Capacity in tonnes
XXX	XXX
XXX	XXX
XXX	XXX
Total	XXX

Table: Benzene capacity in Brazil during 2010, in tonnes

The total capacity in Brazil will be significantly increased by Petrobras' large project with a capacity of X tonnes, which is planned for 2012 (Table).

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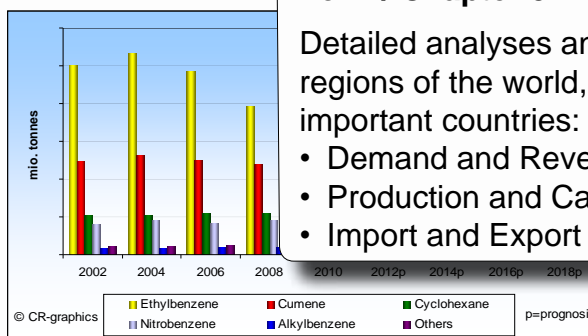
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4.4 Applications – North America

The total demand for benzene in North America was X million tonnes in 2010, whereof almost X% were used to produce ethylbenzene (Graph). All in all, around X million tonnes were used in this application area (Table). The second-largest benzene market was the production of cumene with a X% share, followed by cyclohexane and nitrobenzene. Other applications had a



Graph: Demand for benzene in North America from 2002 to 2018, divided by application

in millions of tonnes	2002	2004	2006	2008	2010	2012p	2014p	2016p	2018p
Ethylbenzene	X	X	X	X	X	X	X	X	X
Cumene	X	X	X	X	X	X	X	X	X
Cyclohexane	X	X	X	X	X	X	X	X	X
Alkylbenzene	X	X	X	X	X	X	X	X	X
Nitrobenzene	X	X	X	X	X	X	X	X	X
Others	X	X	X	X	X	X	X	X	X
Total	X	X	X	X	X	X	X	X	X

Table: Demand for benzene in North America from 2002 to 2018, divided by application

Vol. I / Chapter 3

Detailed analyses and forecasts for the 7 regions of the world, mainly for the 35 most important countries:

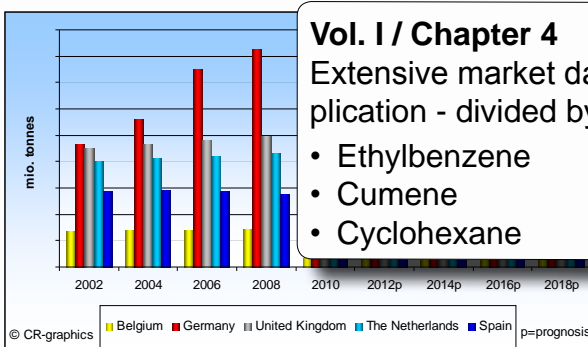
- Demand and Revenue
- Production and Capacities
- Import and Export

4.2.3 Cyclohexane – Western Europe

The demand for benzene by cyclohexane manufacturers increased by X% annually during past eight years, resulting in a demand for more than X million tonnes in 2010 (Graph). We expect that demand will amount to X million tonnes in 2018, translating to an average annual growth rate of X% between 2010 and 2018. More than X% of the demand for benzene by Western European manufacturers of cyclohexane was accounted for by Germany in 2010 (Table). Great Britain came second, followed by the Netherlands and Spain.

Country	Share in 2002	Share in 2010	Share in 2018p
Germany	X%	X%	X%
United Kingdom	X%	X%	X%
The Netherlands	X%	X%	X%
Spain	X%	X%	X%
Belgium	X%	X%	X%
Total	100%	100%	100%

Table: Demand for benzene by cyclohexane manufacturers in Western Europe from 2002 to 2018, divided into the most important countries, in percent



Vol. I / Chapter 4

Extensive market data on the fields of application - divided by the 7 world regions:

- Ethylbenzene
- Cumene
- Cyclohexane
- Alkylbenzene
- Nitrobenzene
- Others

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Valero Energy Corporate		
One Valero Way		
San Antonio, TX 78249-1616		
USA		
Tel.	1 210 345 2000	
Fax	1 210 345 2103	
Web	www.valero.com	
E-mail	corporatcommunications@valero.com	
Financial Key Data		
(in billion US\$)	2007	2008
Turnover	90	113
Net Income	5.23	-1.13
Divisions, Product range	The company's product portfolio includes: <ul style="list-style-type: none"> • Fuels <ul style="list-style-type: none"> Gasoline, diesel, jet fuel, • Speciality products <ul style="list-style-type: none"> Asphalt, propane, sulfur aromatics, natural gas liquids 	
Production sites	The company operates refineries in the USA and one refinery in Canada and Aruba each. Ten ethanol plants are operated within the US.	
Associated Companies	n.a.	
Profile Summary	Valero Energy Corporation is a Fortune 500 company based in San Antonio with approximately 20,700 employees. A network of 14 refineries gives Valero the capacity to process approximately 2.6 million barrels per day, delivering clean fuels and other petroleum products to consumers efficiently and reliably. Valero is also a leading ethanol producer with 10	

Vol. II / Chapter 5

Extensive company profiles for 146 manufacturers, as for example BP, Chevron, China National Petroleum Corp. (CNPC), ConocoPhillips, Exxon Mobil, Flint Hills Resources, Formosa Plastics Group (FPG), Ineos Group, JX Holdings, Royal Dutch Shell, Saudi Basic Industries Corp. (SABIC), SINOPEC, The Dow Chemical und Total.

Note: The profiles are assigned to the country in which the company or holding is headquartered. Company profiles also include JVs and subsidiaries.

ethanol plants in the Midwest and a combined processing capacity of 1.2 billion gallons per year. Meanwhile, Valero's retail and branded marketed throughout North America under the Diamond Shamrock, Shamrock, Ultramar		
Benzene		
Production sites	The company's production sites are located in: <ul style="list-style-type: none"> • Corpus Christi, TX, USA • Three Rivers, TX, USA 	
Associated Companies	n.a.	
Technologies / Licenses	n.a.	
Site / Plant (current)	Capacity (tons / year)	Start
Corpus Christi, TX, USA	360,000	2010
Three Rivers, TX, USA	85,000	1997
Total capacity (currently)	445,000	

Vol. II / Chapter 5

Clearly arranged data and facts on the most important producers:

- Contact details
- Financial key data
- Product range
- Production sites,
- Associated companies
- Profile summary
- Technologies and licenses
- Current and planned production plants and capacities

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Our core competencies include: Chemicals, plastics, additives, commodities, industrial components, packaging, and construction materials.

Several 1,000 companies, institutions, and associations from more than 45 countries have already profited from our global market data and prognoses.

This study is especially useful for:

- Manufacturers and traders of benzene and its precursors
- Processing companies, such as manufacturers of ethylbenzene, cumene, cyclohexane, alkylbenzene, and nitrobenzene, as well as their clients
- Investors and analysts
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- Associations and institutes
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