Market Study: Styrene-Butadiene Rubber (SBR)

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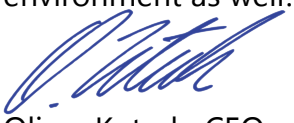

Oliver Kutsch, CEO

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Our Market Studies

The basis for your strategic planning:
- Analysis of attractiveness and current situation of the market
- Analysis of the future development of the market
- Analysis of competitors
- Analysis of customer industries
- Analysis of supply industries

Your Strategic Planning

With our studies you will recognize:
- Current market trends and developments on time
- Ideal procurement and sales markets
- Relevant future markets and target groups
- Risks and market chances on time
- Candidates for mergers and acquisitions as well as divestments

Your Success

The strategic planning enables you to:
- Restructure your product portfolio
- Evaluate current and potential locations
- Plan and develop new marketable products
- Better adapt to needs and requirements of customers
- Deal with future markets

In its most recent study, Ceresana analyzes the world market for styrene-butadiene rubber (E-SBR and S-SBR). Per year, more than 5.1 million tonnes of these types of rubbers are consumed worldwide. More than half of global demand is generated in the region Asia-Pacific. The study deals with data for the years starting in 2009 and forecasts data until 2025. All information on demand, production, import and export for the period are indicated in tonnes – the revenues in the currencies US dollar and Euro.

Emulsion and Solution

Elastomers have been necessary for several technical applications but also for various everyday objects in the past decades. Styrene-butadiene rubber is a copolymer consisting of the chemicals butadiene and styrene, which Ceresana has already analyzed in separate market studies. SBR is produced by emulsion polymerization (E-SBR) or by solution polymerization (S-SBR). Styrene-butadiene latex, which is used for example as coating in the paper and textile industries, is not considered in this study. E-SBR is accounting for about 72% of total demand for SBR. The smaller S-SBR market, however, is accounting for much more dynamic growth rates of 3.8% per year.

Tires Are the Most Important Application

In this report, the use of SBR in the segments tires, industrial and construction products as well as other areas of applications is analyzed. The most important sales market in 2017 was the segment tires: More than 67% of total worldwide demand was generated by tires and replacement tires. Tires are mainly made of SBR, BR and natural rubber. E-SBR is mostly used for standard tires. In contrast, S-SBR is needed to manufacture tires with high abrasion resistance and low rolling friction.

Growing Demand for SBR

The manufacture of industrial products is the second largest application area worldwide, consuming about 740,000 tonnes. SBR is required for a wide range of products in the individual industries from the chemical industry, mechanical engineering, the automotive industry (except for the tire sector, which is considered individually) to the electrical and electronics industry. Rubbers are used in, e.g., conveyor belts, roll coverings, consumer goods, hoses, profiles, gaskets, cables, adhesives, molded parts, and plastic modification. In the construction industry, SBR is used for the production of, for example, pipes and pipe gaskets, cables, roofing films, profiles as well as for the modification of other building materials. From 2017 to 2025, Ceresana expects global demand in the segment construction industry to increase by 2.0% per year.

The Study in Brief:

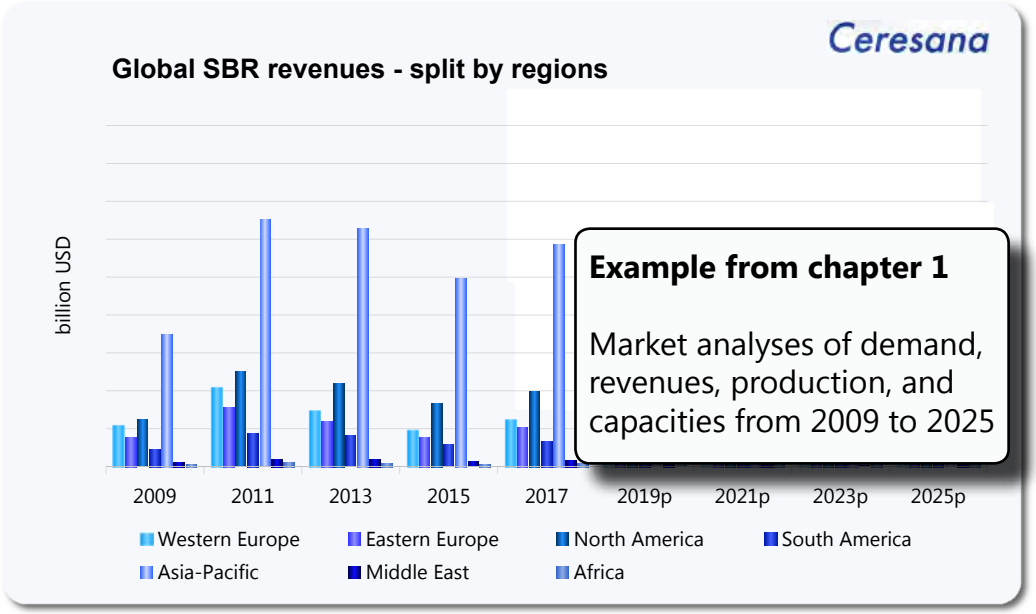
Chapter 1 provides a description and analysis of the global SBR market, including forecasts up to 2025: The development of revenues, demand volumes, and production is analyzed for each region of the world.

Chapter 2 offers a detailed analysis of 23 countries: Demand, export, import, production, capacities, and revenues in regard to SBR. Additionally, demand split by applications is examined in regard to these countries. Market data on demand are split by the types S-SBR and E-SBR for each country.

Chapter 3 analyzes the different types of application areas of SBR in detail: Data and influencing factors on the use in tires, industrial products (conveyor belts, roll coverings, consumer goods, tubes, adhesives, moldings, etc.), construction products (pipes & pipe gaskets, cables, roofing films, profiles), as well as other application areas (leisure and sports products, protective clothing, soles, gloves, and textiles).

Chapter 4 examines the demand for SBR in the regions Western Europe, Eastern Europe, North and South America, Asia-Pacific, the Middle East, and Africa – split by the styrene-butadiene types E-SBR and S-SBR.

Chapter 5 offers a useful directory of the 41 most important producers, clearly arranged according to contact details, revenues, profit, product range, production sites, profile summary, and information on capacities. The most important manufacturers include: Arlanxeo, Goodyear, JSR, Kumho, PetroChina, Sinopec, Synthos, Trinseo, TSRC, and Versalis.



Example from chapter 1

Market analyses of demand, revenues, production, and capacities from 2009 to 2025

1.2 Western Europe

1.2.1 Demand

Demand for SBR in Western Europe totaled approximately X tonnes in 2017. Until 2025, we expect an increase in demand by X% p.a. Given this growth rate, Western Europe's share of global demand is likely to decline from X% in 2017 to roughly X% in 2025.

About X% of Western European demand originated in Germany. The remaining Western European countries (the Netherlands, Sweden, Austria, Portugal, Belgium, Denmark, Switzerland, Finland, Norway, Ireland) reached an aggregated market share of X%.

The most dynamic growth rate of X% p.a. in the upcoming eight years is projected for Germany. The United Kingdom is expected to incur the weakest development.

in 1,000 tonnes	2009	2011	2013	2015	2017	2019p	2021p	2023p	2025p	2017-2025
Germany	X	X	X	X						
France	X	X	X	X						
United Kingdom	X	X	X	X						
Italy	X	X	X	X						
Spain	X	X	X	X						
Other	X	X	X	X						
Total	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X% p.a.**

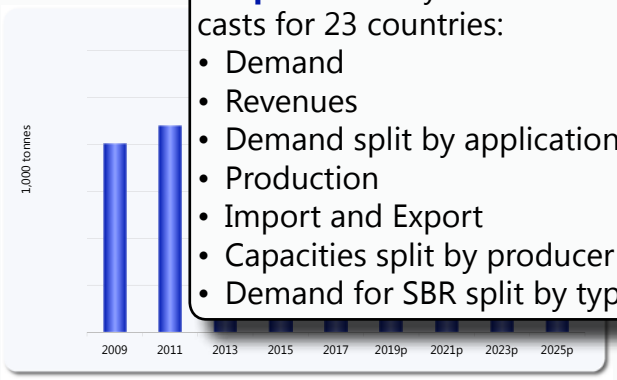
Table: Demand for SBR in Western Europe from 2009 to 2025 – split by major countries

Chapter 1: Market data for 7 world regions:
- Demand
- Revenues
- Production
- Capacities

2.5.6 South Korea

2.5.6.1 Demand and Revenues

Demand for SBR amounted to X tonnes in 2017. We expect consumption volume in South Korea to continue to rise by X% p.a. to approx. X tonnes in 2025. Revenues generated with SBR in South Korea amounted to around USD X million in 2017. We forecast a market value of USD X million to be reached in 2025.

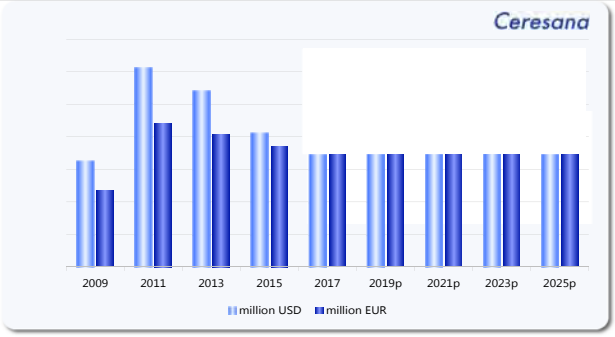


Graph: Demand for SBR in South Korea from 2009 to 2025

Chapter 2: Analyses and forecasts for 23 countries:
- Demand
- Revenues
- Demand split by applications
- Production
- Import and Export
- Capacities split by producer
- Demand for SBR split by types

in 1,000 tonnes	2009	2011	2013	2015	2017	2019p	2021p	2023p	2025p	2017-2025
S-SBR	X	X	X	X	X	X	X	X	X	X% p.a.
E-SBR	X	X	X	X	X	X	X	X	X	X% p.a
Total	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X% p.a**

Table: Demand for SBR in South Korea from 2009 to 2025 – split by types of SBR



Graph: Revenues generated with SBR in South Korea from 2009 to 2025 in million USD and million EUR

The most important sales market in 2017 was the segment tires. We expect the segment construction to see the strongest growth in demand at an average annual rate of X% during the next eight years.

in 1,000 tonnes	2009	2011	2013	2015	2017	2019p	2021p	2023p	2025p	2017-2025
Tires	X	X	X	X	X	X	X	X	X	X% p.a.
Industry	X	X	X	X	X	X	X	X	X	X% p.a.
Construction	X	X	X	X	X	X	X	X	X	X% p.a.
Others	X	X	X	X	X	X	X	X	X	X% p.a.
Total	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X% p.a.**

Table: Demand for SBR in South Korea from 2009 to 2025 – split by applications

In the past years, GDP in South Korea increased constantly. Another growth of 3.0 % (2.8 % in 2016) could be observed in 2017. For 2018, a GDP growth of 3,0 % is forecast.

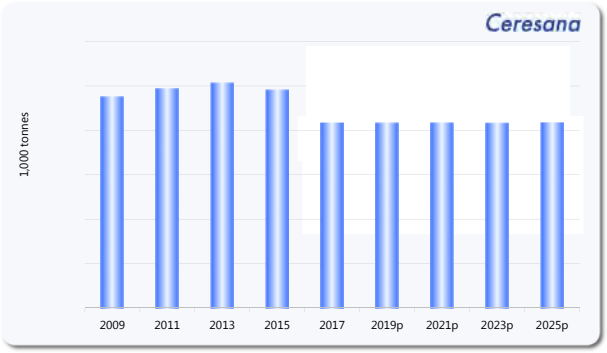
Incidents such as the recall of the smartphone Galaxy Note 7 of the company Samsung but also the low birth rates, an aging population, as well as an increasing unemployment rate had impeding effects on the economic growth in 2017. However, rising export and import figures as well as increasing investments have a positive impact on the South Korean economy. The new South Korean government, which is in office since May 2017, focuses on future industries such as renewable energies and the digitization of the industry. The government wants to boost the economy with wage increases and rising employment rates. However, high expenditures on education and the low birth rate will continue to dampen private household consumption.

Compared to the previous year, the overall production of vehicles in South Korea decreased slightly. In 2017, production of vehicles amounted to about 4.1 million units (2016: 4.2 million vehicles). This decrease can be explained by declining export figures as well as a decreasing domestic demand. Local manufacturers tend to invest more in other countries such as China, India or the USA. In the future, increased attention is to be paid to electric vehicles and autonomous driving. In the past years, high growth rates were registered in the segment electric vehicles. The country plans to invest about USD 32 million in the development of autonomous vehicles as well as in electric vehicles with a range of over 500 kilometers in the upcoming five years.

In 2016, a dynamic growth in the construction industry could be observed, which weakened slightly in 2017. This decline can be explained by the fact that in some segments, such as office space, oversupply prevails and vacancies occur. To stabilize the housing market, the government has introduced tax increases and stricter rules on granting a credit regarding real estate acquisition in fall 2017. The main aim of the measures is to counteract speculation with residential real estate. In addition, the high level of private debt and demographic factors are hindering the development of the construction sector. An ageing population as well as an increase in single households lead to a rising demand for small apartments. Energy efficient construction gains more and more importance in South Korea. The government is successively reducing the regulations for permitted energy consumption in new buildings and is planning an energy revolution as apart of emission control. This will have positive effects on demand for the ...

2.5.6.2 Production, Capacities and Trade

The production of SBR accounted for X million tonnes in 2017. We forecast production volume to increase by X% p.a. during the upcoming eight years. Approx. X tonnes will be produced in 2025.



Company	Product	in tonnes
	E-SBR	XXX,000
	E-SBR	XXX,000
	S-SBR	XXX,000
	S-SBR	XXX,000
	S-SBR	XXX,000
Total		**XXX,000**

Table: Capacities of SBR in South Korea in 2017 – split by producers

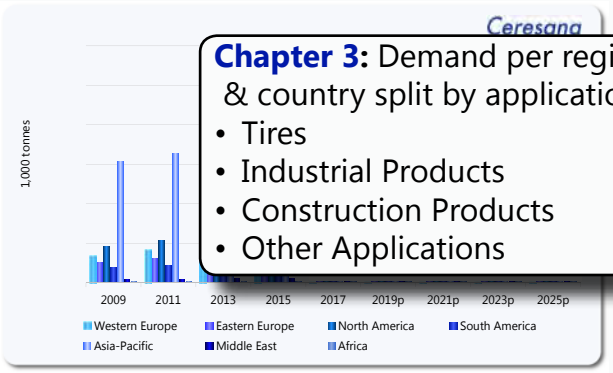
3 Applications

3.1 World

3.1.1 Tires

Tires are mainly made of the rubber types SBR, BR, and natural rubber Styrene butadiene rubber (SBR) is a copolymer derived from butadiene and styrene. SBR is produced by emulsion polymerization (E-SBR) or solution polymerization (S-SBR). This type of rubber offers a high abrasion resistance as well as a high resistance against heat and cold. While E-SBR is mainly used for standard tires, S-SBR is needed to manufacture tires with high abrasion resistance and low rolling friction.

In 2017, almost X million tonnes of SBR were used for the sales market tires. Given a X% p.a. increase, global demand will amount to over X million tonnes in 2025.



Chapter 3: Demand per region & country split by applications:
- Tires
- Industrial Products
- Construction Products
- Other Applications

Graph: Global demand for SBR in the segment tires from 2009 to 2025 – split by regions

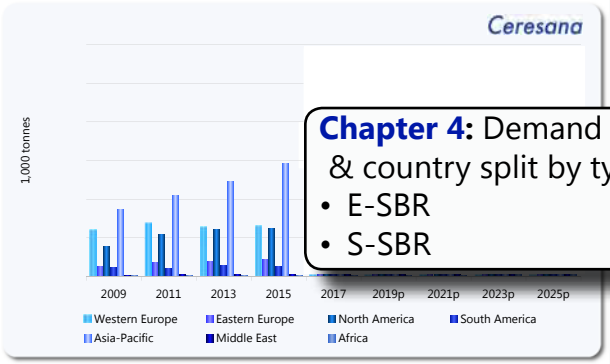
4 Products

4.1 S-SBR

4.1.1 World

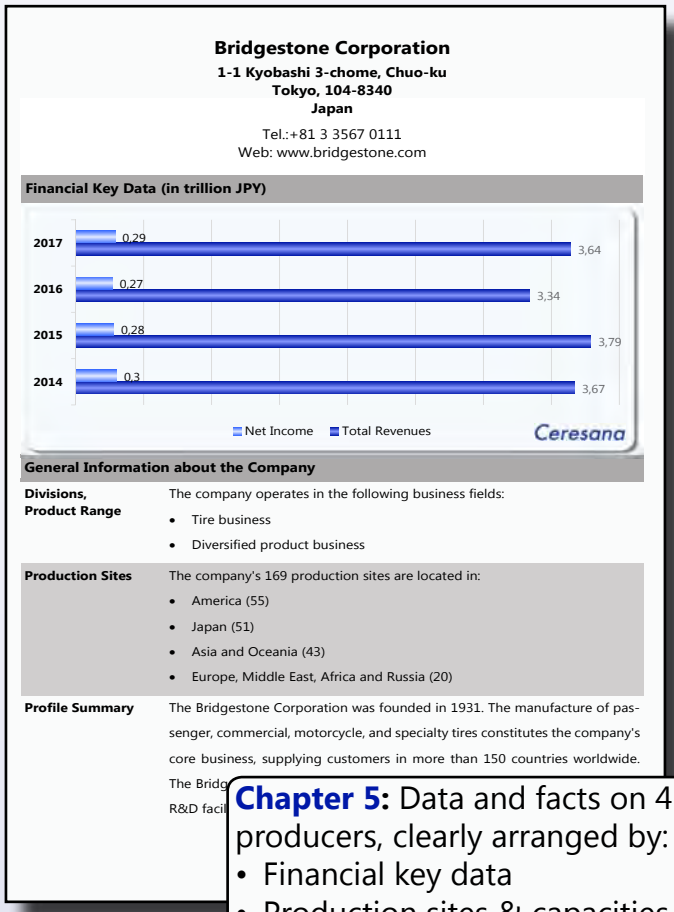
About X million tonnes of S-SBR were consumed in 2017. Out of the total volume used worldwide in 2017, about X% were used in Asia-Pacific. The highest relative increase at rates of X% p.a. between 2017 and 2025 is anticipated for Asia-Pacific. Consumption in this region is expected to rise to approx. X million tonnes.

We forecast total market volume to rise to approx. X million tonnes in 2025. Accordingly, demand will rise by X% p.a. between 2017 and 2025.



Chapter 4: Demand per region & country split by types:
- E-SBR
- S-SBR

Graph: Global demand for S-SBR from 2009 to 2025 – split by regions



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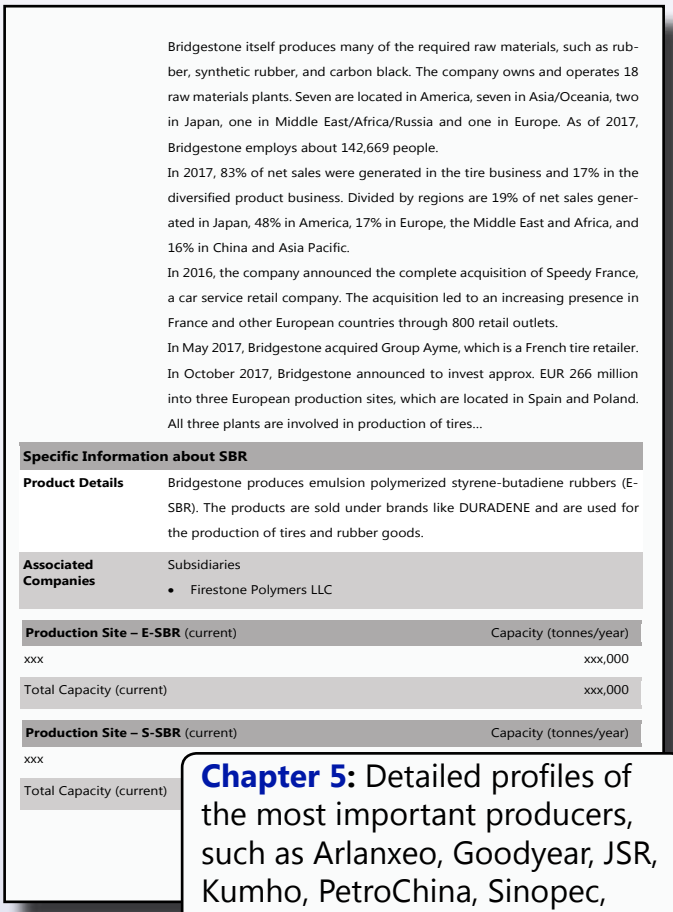
Web: www.bridgestone.com

Financial Key Data (in trillion JPY)

General Information about the Company

Divisions, Product Range	The company operates in the following business fields: • Tire business • Diversified product business
Production Sites	The company's 169 production sites are located in: • America (55) • Japan (51) • Asia and Oceania (43) • Europe, Middle East, Africa and Russia (20)
Profile Summary	The Bridgestone Corporation was founded in 1931. The manufacture of passenger, commercial, motorcycle, and specialty tires constitutes the company's core business, supplying customers in more than 150 countries worldwide. The Bridg R&D facil

Chapter 5: Data and facts on 41 producers, clearly arranged by:
- Financial key data
- Production sites & capacities
- Profile summary



Bridgestone itself produces many of the required raw materials, such as rubber, synthetic rubber, and carbon black. The company owns and operates 18 raw materials plants. Seven are located in America, seven in Asia/Oceania, two in Japan, one in Middle East/Africa/Russia and one in Europe. As of 2017, Bridgestone employs about 142,669 people.
In 2017, 83% of net sales were generated in the tire business and 17% in the diversified product business. Divided by regions are 19% of net sales generated in Japan, 48% in America, 17% in Europe, the Middle East and Africa, and 16% in China and Asia Pacific.
In 2016, the company announced the complete acquisition of Speedy France, a car service retail company. The acquisition led to an increasing presence in France and other European countries through 800 retail outlets.
In May 2017, Bridgestone acquired Group Ayme, which is a French tire retailer.
In October 2017, Bridgestone announced to invest approx. EUR 266 million into three European production sites, which are located in Spain and Poland. All three plants are involved in production of tires...

Specific Information about SBR

Product Details	Bridgestone produces emulsion polymerized styrene-butadiene rubbers (E-SBR). The products are sold under brands like DURADENE and are used for the production of tires and rubber goods.
Associated Companies	Subsidiaries • Firestone Polymers LLC

Production Site – E-SBR (current)	Capacity (tonnes/year)
xxx	xxx,000
Total Capacity (current)	xxx,000

Production Site – S-SBR (current)	Capacity (tonnes/year)
xxx	
Total Capacity (current)	

Chapter 5: Detailed profiles of the most important producers, such as Arlanxeo, Goodyear, JSR, Kumho, PetroChina, Sinopec, Synthos, Trinseo, TSRC & Versalis.

This study is useful for:

- Producers, traders and converters of elastomers such as styrene butadiene rubber (SBR), butadiene rubber (BR), acrylonitrile butadiene rubber (NBR), ethylene propylene diene monomer (EPDM) rubber, etc.
- Companies operating in the fields of: Tires and other rubber goods such as tubes, seals, cables, conveyor belts, roll coverings, consumer goods, profiles, adhesives, moldings, roofing foil, floorings, protective clothing, soles, gloves and other textiles, leisure products, and sporting goods
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