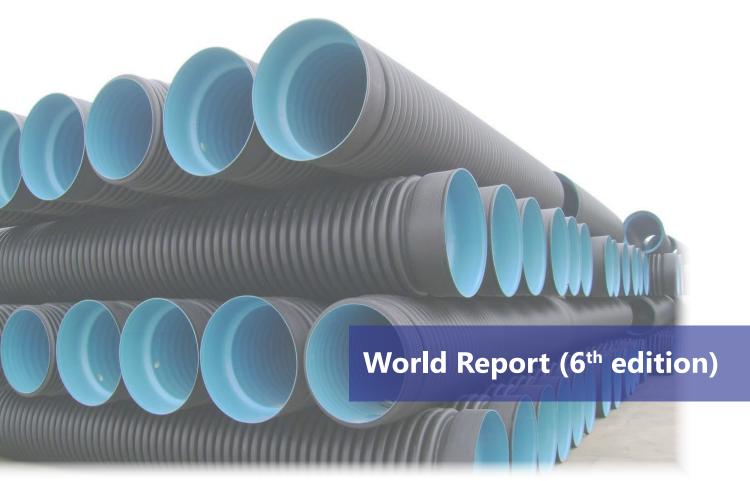
Market Study: Plastic Pipes





This brochure provides further information on the study "Plastic Pipes - World (6th edition)"

Executive Summary

Things are looking up again for manufacturers and distributors of plastic pipes: the current year already promises a recovery. The latest edition of Ceresana forecasts an CAGR of 3%. However, the outlook varies greatly from region to region. In Western Europe, demand is not expected to exceed the 2021 level until 2025. The construction industry in China is also finding it difficult to build on previous records. North America, on the other hand, is setting a faster pace. In the USD in particular, the government is currently investing large sums in the infrastructure of the future, for example USD 15 billion in replacements for old lead potable water pipes alone.

Nothing works without pipes

The industry analysis now also includes a breakdown of sales in USD for the various applications. Demand is growing most strongly in the areas of "potable water" and "agriculture". For the agricultural sector alone, Ceresana expects global demand to increase by around 3.8% per year until 2032. The increase in extreme weather phenomena makes more efficient, more powerful water pipes necessary. Dense, low-loss plastic pipes not only help to protect the environment in wastewater disposal, drinking water and gas supply. The switch to renewable energies and the development of hydrogen networks require new pipes. Plastic cable protection pipes shield fiber optic networks, power lines and other electrical cables against damage without requiring a great deal of maintenance. Compared to metal or concrete, plastic pipes are more durable, corrosion-resistant and resistant to many chemicals. They are lightweight and easy to install.

Specific plastics for any pipe requirement

Various types of plastic are used for the different applications, from civil engineering to buildings and industrial plants. Classic PVC pipes are still used in large quantities. PVC is also chlorinated (PVC-C or CPVC) for better flexibility and heat resistance. However, the controversial plastic PVC is increasingly facing competition: PE pipes, for example, are very flexible and hardly susceptible to cracking making them ideal for gas pipes and industrial applications. PE-X, also known as XPE or XLPE, stands for "cross-linked polyethylene", which is particularly flexible and durable. The market for heat-resistant PP pipes and for the collective category "pipes made of other plastics" is currently developing most dynamically. These include, for example, highly impact-resistant and temperature-resistant ABS pipes made from the engineering plastic acrylonitrile butadiene styrene. Increasingly, recycled plastics and bioplastics are also being processed into pipes.

The study in brief:

Chapter 1 provides a presentation and analysis of the global market - including forecasts up to 2032: For each region of the world, **revenues** (in USD & EUR) as well as **production** and **demand** (in tonnes) are given.

Chapter 2 examines the largest national markets individually: Revenues, imports and exports in the **16 most important countries**. The **production** and **demand** volumes are stated separately for the various **types of plastic**: PE, PP, PVC, and Other plastics.

In addition, **demand** and **revenue** are presented for each country, broken down by **application**: Sewage, Potable water, Cable protection, Gas supply, Agriculture, Industry, and Other applications.

Chapter 3 provides **97 company profiles** of the most important **producers**, auch as Aalberts, Aliaxis, Atkore, Fletcher, Georg Fischer, Lesso, Nan Ya, Orbia, Sekisui, and Tessenderlo.



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2.4.1.1 Demand and Revenues

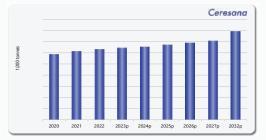
Social housing is particularly important for housing construction: in 2021 and 2022, more than half of all new builds were subsidized with state loans. The government under President Lula wants to provide around 2 million families with subsidized home ownership by 2026 through the "Minha Casa Minha Vida" (MCMV) programme. By the end of 2023, the construction of 30,000 apartments, which had been suspended for some time, is to be resumed. In the state of São Paulo, the "Nossa Casa" program is building apartments in public-private partnerships. In the city of São Paulo, the city center is to be redeveloped and 38,000 apartments are to be promoted with the "Pode Entrar" programme.

Following the end of the Covid-19 pandemic, hotel chains are once again investing in new buildings, particularly in the north-east of Brazil. From 2023, the luxury residence and hotel complex "Maraey" will be built on the south coast in Maricá in partnership with Marriott International at a cost of USD 2.1 billion. In the south of São Paulo, the "Beyond The Club" (BTC) leisure project, a complex with an artificial beach, surf pools, sports arenas, luxury apartments and stores, is to be built by 2025 at a cost of USD 1 billion. The US chain Hard Rock plans to build eight to ten hotel, commercial and residential complexes by 2028 at a cost of USD 1.3 billion.

In commercial construction, demand for logistics centers, warehouses and data centers is growing in particular. Major projects in industrial construction include two pulp mills in the federal state of Mato Grosso do Sul, which together cost more than USD 6.6 billion and are scheduled to go into operation from 2024. In 2022, 8 new shopping centers were added to the existing 620 malls. A further 15 shopping centers are scheduled to open in 2023.

In 2022, private investment accounted for 80% of infrastructure spending in Brazil; the state budget fell to its lowest level in 17 years. One reason for this was corruption scandals involving the major construction companies. More than a third of around 14,000 state construction sites, such as for new schools, were "dormant" in 2022. The Lula government now wants to increase state infrastructure spending again. In 2023 alone, almost USD 4.5 billion more funds are to be made available for this purpose than the previous Bolsonaro government had spent in four years.

As the state only has limited financial leeway, Brazil continues to rely on public-private part nerships under President Lula: Infrastructure projects, e.g. sections of highway, airports, sewage treatment plants or power plants, are auctioned off to large operating companies and consortia. In 2022, 48 projects were awarded at federal level, including 22 airports and the privatization of the electricity company Elektrobras. In 2023, 141 projects with an investment volume of around USD 45 billion are to be auctioned off. Various federal states and cities are also entering into partnerships with private infrastructure operators. In São Paulo, 15 projects with a volume of almost USD 35 billion are planned. As Brazil wants to double the share of rail transportation to 40% by 2035, 12,000 km of rail projects have already been approved at a cost of around USD 33 billion. In the seaports, 11 private terminals are currently under construction at a cost of USD 4.8 billion, with further projects worth USD 3.3 billion in the pipeline. A USD 2 billion sewage treatment plant is under construction on the Tietê River and is scheduled for completion in 2025. Chinese infrastructure companies are ecoming increasingly involved in Brazil. In April 2023, for example, President Lula and the China Communications Construction Company (CCCC) agreed to build a railroad in the state of Pará for USD 2 billion



Graph: Revenues in Brazil from 2020 to 2032

In 2022, demand for plastic pipes in Brazil amounted to X tonnes. We expect the Brazilian market volume to grow by X% annually to around X tonnes by 2032.

Revenues generated with plastic pipes in Brazil reached a level of around USD X billion in 2022. We forecast the market volume to increase to USD X billion by 2032.

Market Study: "Plastic Pipes - World (6th edition)" 16 Countries, 97 Producers, 390 Pages, 88 Graphs, 195 Tables, 11/2023

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(For each country: **Demand and produc**tion split by product types, import & export as well as revenues and demand split by applications)

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| Revenues | 2020 | 2021 | 2022 | 2023p | 2024p | 2025p | 2026p | 2027p | 2032p | 2022- 2032 |
|--------------------|----------|--------|-------|---------|----------|--------|-------|----------|-------|---------------|
| million USD | х | х | х | х | х | х | х | х | х | X % p.a. |
| million EUR | х | х | х | х | х | х | х | х | х | X % p.a. |
| Table: Revenues in | Brazil f | rom 20 | 20 to | 2032, i | n millic | on USD | and m | illion E | UR | |

| in 1.000 Tonnen | 2020 | 2021 | 2022 | 2023p | 2024p | 2025p | 2026p | 2027p | 2032p | 2022- 2032 |
|--------------------|-----------|-------|---------|-------|----------|--------|-------|-------|-------|---------------|
| Sewage | х | х | х | х | х | х | х | х | х | X % p.a. |
| Potable Water | х | х | х | х | х | х | х | х | х | Х % p.a. |
| Cable Protection | х | х | х | х | х | х | х | х | х | Х % p.a. |
| Gas Supply | х | х | х | х | х | х | х | х | х | Х % p.a. |
| Agriculture | х | х | х | х | х | х | х | х | х | X % p.a. |
| Industry | х | х | х | х | х | х | х | х | х | X % p.a. |
| Other | х | х | х | х | х | х | х | х | х | X % p.a. |
| Total | х | х | х | х | х | х | х | х | х | Х % p.a. |
| Table: Demand in | Brazil fr | om 20 | 20 to 2 | 032 - | split by | applic | ation | | | |

| in 1,000 tonnes | 2020 | 2021 | 2022 | 2023p | 2024p | 2025p | 2026p | 2027p | 2032p | 2022- 2032 |
|--------------------|----------|--------|---------|----------|---------|-------|-------|-------|-------|---------------|
| PE | х | х | х | х | х | х | х | х | х | X % p.a. |
| PP | х | х | х | х | х | х | х | х | х | X % p.a. |
| PVC | х | х | х | х | х | х | х | х | х | X % p.a. |
| Other | х | х | х | х | х | х | х | х | х | Х % p.a. |
| Total | х | х | х | х | х | х | х | х | х | Х% p.a. |
| Table: Demand in B | razil fr | om 202 | 20 to 2 | 2032 - 9 | plit by | produ | ct | | | |

e" sector was the largest area of application for plastic pipes in 2022, accounting for around X tonnes. We expect the "potable water" submarket to account for the highest percentage increases over the next ten years.

| in million USD | 2020 | 2021 | 2022 | 2023p | 2024p | 2025p | 2026p | 2027p | 2032p | 2022- 2032 |
|------------------|------|------|------|-------|-------|-------|-------|-------|-------|---------------|
| Sewage | х | х | х | х | х | х | х | х | х | X % p.a. |
| Potable Water | х | х | х | х | х | х | х | х | х | X % p.a. |
| Cable Protection | х | х | х | х | х | х | х | х | х | X % p.a. |
| Gas Supply | х | х | х | х | х | х | х | х | х | X % p.a. |
| Agriculture | х | х | х | х | х | х | х | х | х | X % p.a. |
| Industry | х | х | х | х | х | х | х | х | х | X % p.a. |
| Other | х | х | х | х | х | х | х | х | х | X % p.a. |
| Total | х | х | х | х | х | х | х | х | х | Х% p.a. |

2.4.1.2 Production and Trade

The production of plastic pipes amounted to around X tonnes in 2022. We expect gro rates of X% per year over the next ten years. The production volume is expected to increase to around X tonnes by 2032.

| in 1,000 tonnes | 2020 | 2021 | 2022 | 2023p | 2024p | 2025p | 2026p | 2027p | 2032p | 2022 2032 |
|--------------------|------------|------------------|------------------|--------------------|--------------------|-------------|--------------------|--------------------|-------------------|---|
| Production | х | х | х | х | х | х | х | х | х | X % p.a. |
| Import | х | х | х | х | х | х | х | х | х | X % p.a. |
| Export | х | х | х | х | х | х | х | х | х | Х% р.а. |
| Demand | х | х | х | х | х | х | х | х | х | X % |
| Table: Producti | on, import | , expor | t, and | deman | d in Br | azil froi | n 2020 | to 203 | 2 | |
| in 1.000 | | | | | | | | | | |
| tonnes | 2020 | 2021 | 2022 | 2023p | 2024p | 2025p | 2026p | 2027p | 2032p | |
| | 2020 X | 2021 X | 2022 X | 2023 р Х | 2024 p X | | 2026 р Х | 2027 р Х | 2032р Х | 2022- 2032 X % p.a. |
| tonnes | | | | | | x | | | | 2032 X % p.a. X % |
| tonnes PE | х | x | x | x | x | x | x | x | x | 2032 X % p.a. X % p.a. X % |
| tonnes PE PP | x x | x | x x | x | x | x x x | x | x | x x | 2032 X % p.a. X % p.a. |

Table: Production in Brazil from 2020 to 2032 – split by produc



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3 Company Profiles*

3.1 Western Europe

Austria (6 Producers) Belgium (3) Denmark (1) Finland (1) Germany (17) Italy (4) Norway (1) Spain (2) Sweden (1) Switzerland (8) The Netherlands (2) United Kingdom (5)

3.2 Eastern Europe

Romania (1) Russia (2) Turkey (3)

3.3 North America

Canada (1) Mexico (1) USA (13)

3.4 South America Brazil (2)

Diazii (Z)

3.5 Asia-Pacific

China (6) India (6) Japan (4) New Zealand (1) Taiwan (1) Thailand (1)

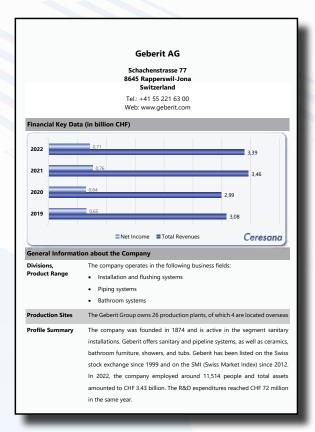
3.6 Middle East

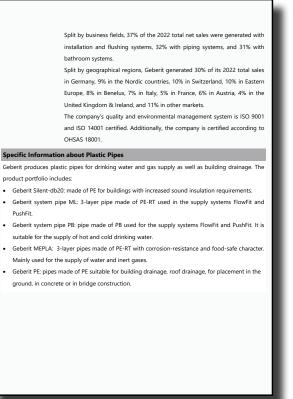
Israel (1) Saudi Arabia (1) United Arab Emirates (1)

3.7 Africa

South Africa (1)

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

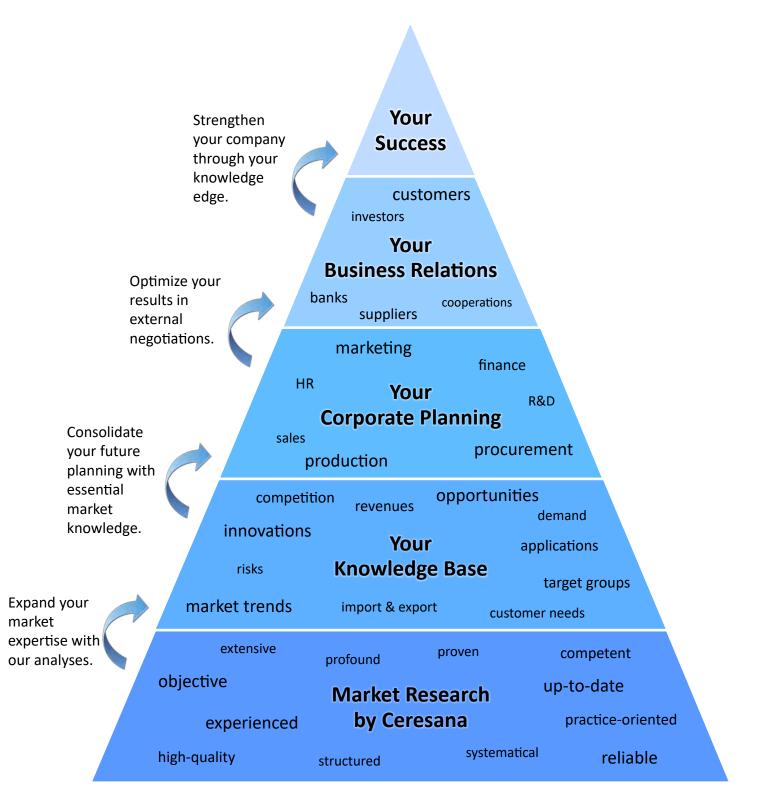




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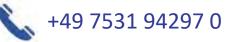
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Biobased Insulation Material - World

Biobased Paints and Coatings - World

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