GRAND VIEW RESEARCH

Polymer Foam Market

MARKET ESTIMATES & TREND ANALYSIS
FROM 2014 TO 2025

BULK CHEMICALS

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Polymer Foam in 2025

MARKET ANALYSIS & SEGMENT FORECAST FROM 2017 TO 2025

Market by Type: Polyurethane Foam, Polystyrene Foam, PVC Foam, Phenolic Foam, Polyolefin Foam, Melamine Foam, Others

By Application: Packaging, Building & Construction, Furniture & Bedding, Automotive, Rail, Wind Energy, Marine, Others

By Region: North America, Europe, Asia Pacific, Central & South America, and Middle East & Africa

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CHAPTER 01 Methodology and Scope

1.1 Research Methodology

We have implemented a mix of primary and secondary research for our market estimates and forecasts. Secondary research formed the initial phase of our study, where we conducted extensive data mining, referring to verified data sources such as independent studies, government and regulatory published materials, technical journals, trade magazines, and paid data sources. This formed the basis of our estimates.

For forecasting, the following parameters were considered:

- Market drivers and restraints, along with their current and expected impact
- Technological scenario and expected developments
- End-use industry trends and dynamics
- Trends in consumer behavior

We have assigned weights to these parameters and quantified their market impact using weighted average analysis to derive an expected market growth rate.

All our estimates and forecasts were verified through exhaustive primary research with Key Industry Participants (KIPs), which typically include:

- Market leading companies
- Raw material suppliers
- Polymer foam manufacturers
- System integrators
- Distributors

The key objectives of primary research are as follows:

- To validate our data in terms of accuracy and acceptability
- To gain an insight into the current market and future expectations

1.2 Research Scope and Assumptions

- The report provides market value for base year 2017 and a yearly forecast until 2025 in terms of volume (Kilotons) and revenue (USD Million). Market for each type and application has been provided on a global as well as regional basis for the aforementioned forecast period.
- Key industry dynamics, regulatory scenario, major technological trends, and application markets were evaluated to understand their impact on the demand over the forecast period. Growth rates have been estimated using correlation, regression, and time-series analysis.
- We have used a bottom-up approach for market sizing, analyzing key regional markets, dynamics, and trends for various end uses. The global market has been estimated by integrating regional markets.

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- All market estimates and forecasts have been validated through primary interviews with the key industry participants
- We have limited the study to six types and seven applications to keep the scope to manageable proportions
- Type segment includes polyurethane foam, polystyrene foam, PVC foam, phenolic foam, polyolefin foam, melamine foam and others
- Application scope includes packaging, building & construction, furniture & bedding, automotive, rail, wind energy, marine, aerospace, sports & leisure, electronics & electrical, and medical
- Prices have been derived using quotes from manufacturers, distributors, vendors, and suppliers in the market. The variation in the quotes obtained through different sources have been normalized with the help of extensive primary interviews.
- Factors including the growth of end-use industries, such as automotive, construction, packaging, furniture, rail, wind energy, and marine, and new product launches by the respective key manufacturers have been taken into consideration while forecasting the market growth.
- Financial data is only provided for publicly listed companies
- Numbers may not add up due to rounding off
- Inflation has not been taken into consideration while estimating and forecasting the market
- Regional markets consist of the following key countries:
    - North America
        - U.S.
        - Canada
        - Mexico
    - Europe
        - Germany
        - France
        - Italy
        - UK
        - Spain
        - Russia
    - Asia Pacific
        - China
        - India
        - Japan
        - South Korea
        - Singapore
        - Indonesia
    - Central & South America
        - Brazil
    - Middle East & Africa (MEA)

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1.3 List to Data Sources

Some of the secondary sources used for this report include:

- Polyurethane Foam Association (PFA)
- European Association of Flexible Polyurethane Foam (EUROPUR)
- Canadian Urethane Foam Contractors Association (CUFCA)
- Federation of European Rigid Polyurethane Foam Associations
- The International Council of Marine Industry Associations (ICOMIA)
- International Marine Purchasing Association (IMPA)
- International Marine Contractors Association (IMCA)
- Association of Marina Industries (AMI)
- The Shipbuilders' Association of Japan (SAJ)
- The Active Shipbuilding Experts' Federation (ASEF)
- Global Renewable Energy Association (GREA)
- American Chemistry Council (ACC)
- Railway Technology International (RTI)
- Federal Railway Authority (EBA)
- European Wind Energy Association (EWEA)
- Global Wind Energy Council (GWEC)
- Railroads & States - Association of American Railroads
- American Wind Energy Association (AWEA)
- WINDExchange: Wind Energy Market Sectors
- US Department of Energy
- International Energy Agency (IEA)
- The Canadian Association of Railway Suppliers (CARS)
- Railway Association of Canada (RAC)
- Canadian Wind Energy Association
- The International Rail Transport Committee
- The International Association of Railway Operations Research (IAROR)
- US International Trade Commission (USITC)
- Association of American Railroads
- European Environment Agency (EEA)
- European Chemicals Agency (ECHA)
- National Marine Manufacturers Association (NMMA)
- U.S. Department of Commerce
- National Office for Statistics
- Company Annual Reports
- Investor Presentations

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Some of the primary sources used for this report include:

- BASF SE
- JSP Corporation
- Polymer Technologies, Inc.
- Rogers Corporation
- Sekisui Alveo AG
- Trelleborg AB
- Mitsui Chemicals, Inc.
- Sumitomo Chemical Co., Ltd.

1.4 List of Abbreviations

Table 1 List of Abbreviations

Mn	Million
USD	USD Dollar
CAGR	Compound Annual Growth Rate
MEA	Middle East & Africa
CSA	Central & South America
KT	Kilotons
PVC	Polyvinyl Chloride

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CHAPTER 02

Executive Summary

Properties of polymer foam, such as extremely light weight, resistance to temperature, and cost competitiveness, are some of the factors driving its demand.

Polymer foam is being widely preferred in many applications including building & construction, automotive, and packaging on account of its properties such as high strength, light weight, buoyancy, resistance to high temperature, and energy absorption. Various types of polymer foams including PVC foams, polyurethane foams, polystyrene foams, silicone foams, and melamine foams are used depending on the application. For instance, rigid polyurethane foam is preferred in building & construction, while PVC foam, on account of its light weight and high strength characteristics, is used in aerospace, wind energy applications.

Asia Pacific market is expected to reach USD 58,593.2 million by 2025 owing to the high-speed rail projects and wind energy capacity additions, primarily in China and India.

In terms of revenue, the global polymer foam market was valued at USD 105,516.5 million in 2017. Polystyrene foam was the largest segment in terms of revenue, which held a market share of 32.26% in 2017. Polyolefin foam segment is one of the fastest growing segment on account of the flexibility and resilience of polyolefin foams. They offer good chemical and abrasion resistance, and its good shock absorbing characteristics make it useful in packaging applications.

Increase in investments in building & construction industry across the globe and ambitious wind energy installation targets in China, India, Germany, and the UK are expected to propel the growth of polymer foam market over the forecast period. However, irregularity in the raw material availability is projected to negatively impact the production volume of polymer foams. Key players in this market include Trelleborg AB, DowDuPont, Inc., Recticel NV, Zotefoams plc, General Plastics, Fritz Nauer AG, and Armacell International S.A. and others.

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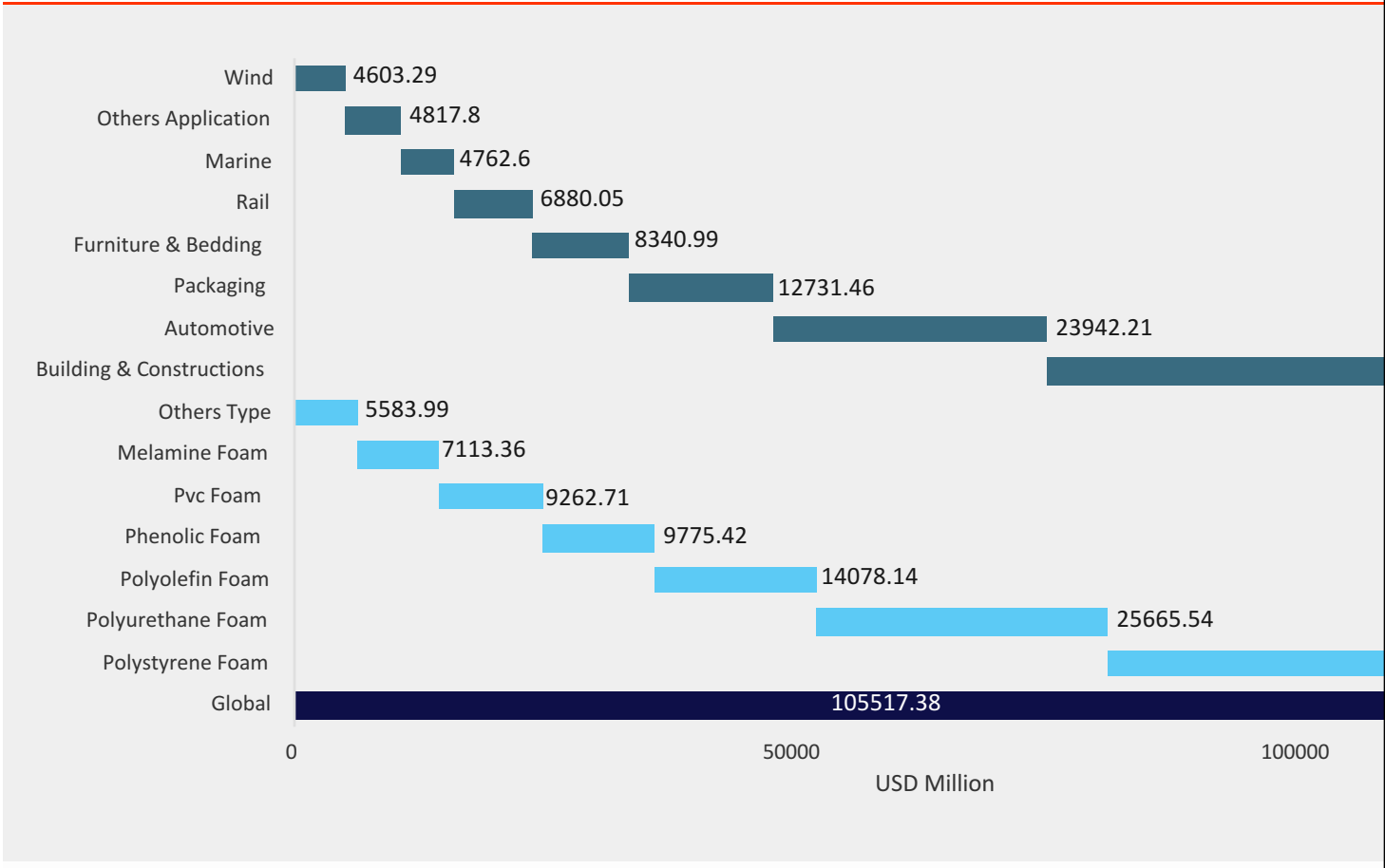
2.1 Market Summary

FIG. 1 Polymer foam market snapshot



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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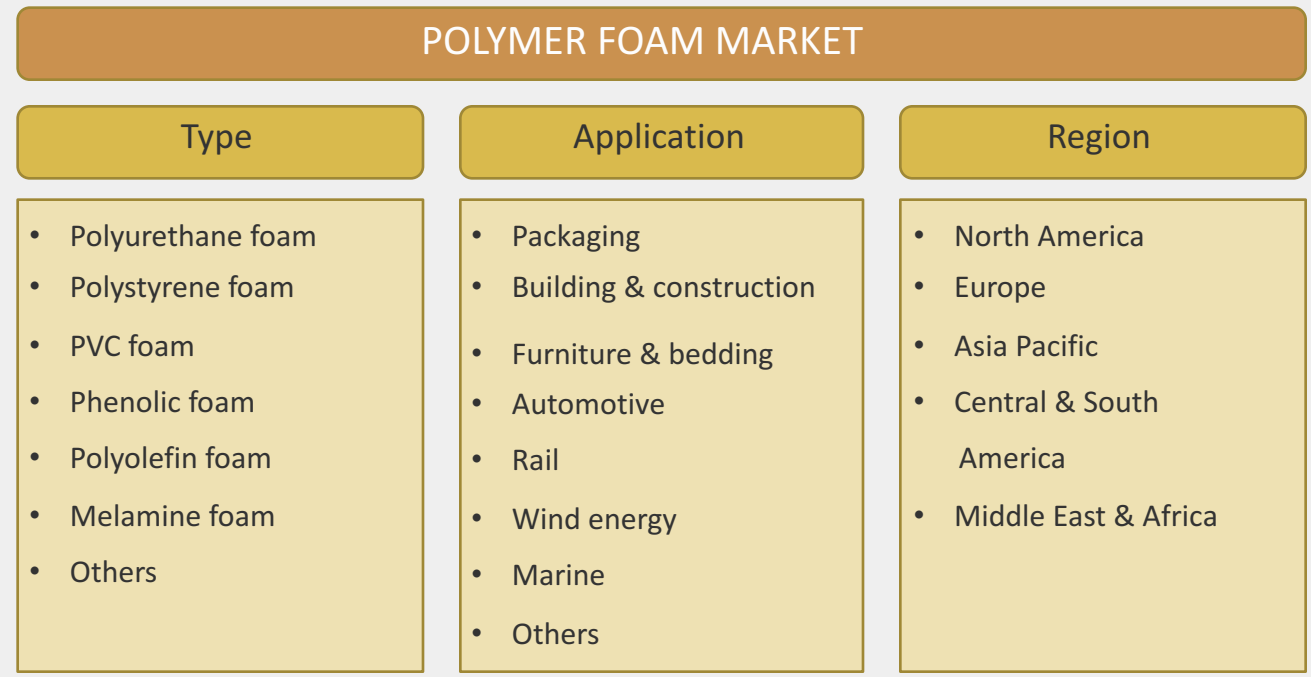
CHAPTER 03

Polymer Foam Industry Outlook

3.1 Polymer foam market segmentation & scope

FIG. 2 Market segmentation & scope



Attribute	Details
Base year used for market estimation	2017
Historic analysis	Actual data from 2014 to 2016
Forecast	2018 to 2025

Source: GREA, EUROPUR, PFA, OICA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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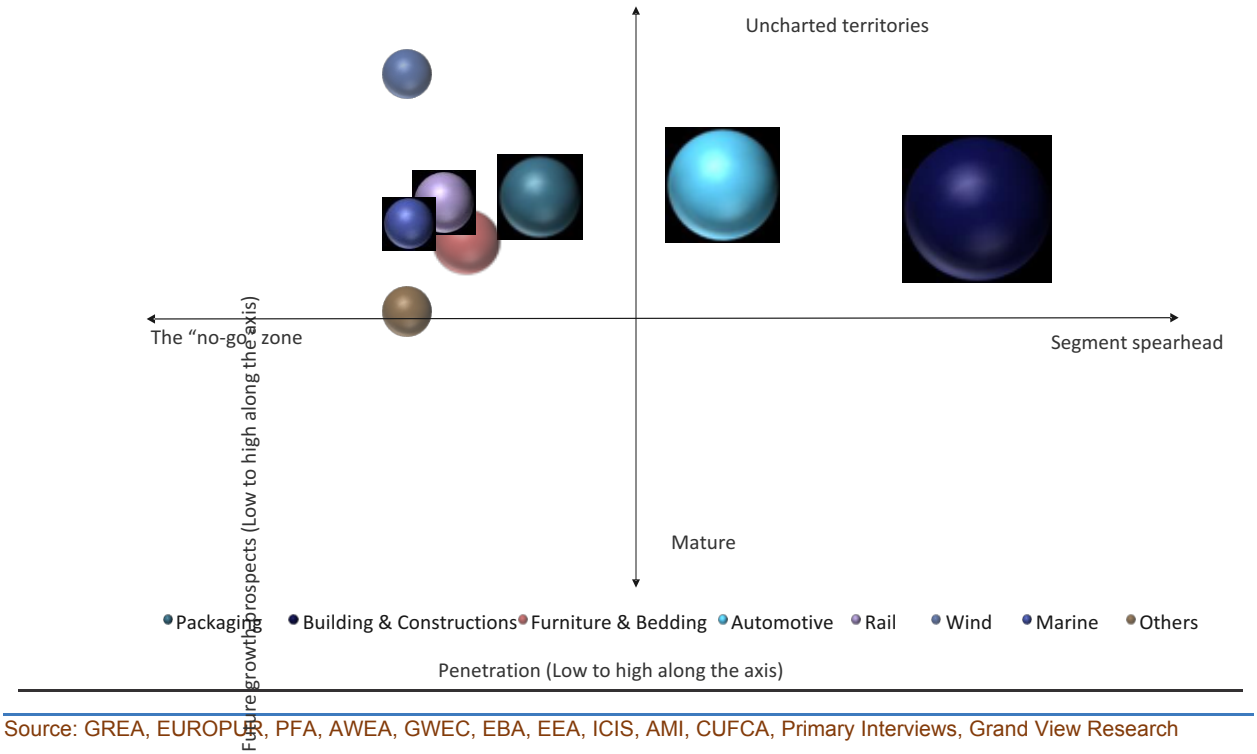
The polymer foam market has been segmented on the basis of type, application, and region. Based on type, the market has been segmented into polyurethane foam, polystyrene foam, polyvinyl chloride (PVC) foam, phenolic foam, polyolefin foam, melamine foam and others. Other foams include silicone foam, PET foam, and PVDF (Polyvinylidene Difluoride) foam. Based on applications, the market is segmented as packaging, building and construction, bedding & furniture, automotive, wind energy, rail, marine, and others. Other applications include, aerospace and medical applications.

On the basis of region, the market has been segmented into North America, Europe, Asia Pacific, Central & South America, and the Middle East & Africa. The market estimates and forecasts have been provided in terms of volume (Kilotons) and in terms of revenue (USD Million), where 2017 has been considered as the base year and a forecast period of seven years from 2018 to 2025 has been considered.

3.2 Penetration & growth prospect mapping

FIG. 3 Penetration & growth prospect mapping



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

*Penetration is defined as the maturity of the product (i.e. type) and its application. Lower penetration rate signifies higher untapped market potential for the growth.

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**Growth rate is considered as the CAGR projected till 2025. These growth rates are comparative in nature with the overall market growth rate being the benchmark.

Polymer foam market is spearheaded by building & construction segment, followed by automotive application segment. Polyurethane foam is a widely used product in building & construction applications. The building & construction segment witnessed the largest market penetration owing to the robust investments by various governments in the construction industry coupled with broad range of applications of polyurethane. The well-established infrastructure industries in the European and North American countries have propelled the segment growth in 2017.

Asia Pacific region is one of the most attractive region for automotive manufacturing. On account of the population growth, the automotive industry in this region is propelling at a tremendous growth rate. This augmented the penetration of polymer foam in automotive application segmentation. Also, the robust wind energy installation projects in the Asia Pacific countries are expected to drive the penetration of polymer foam in wind applications over the coming years.

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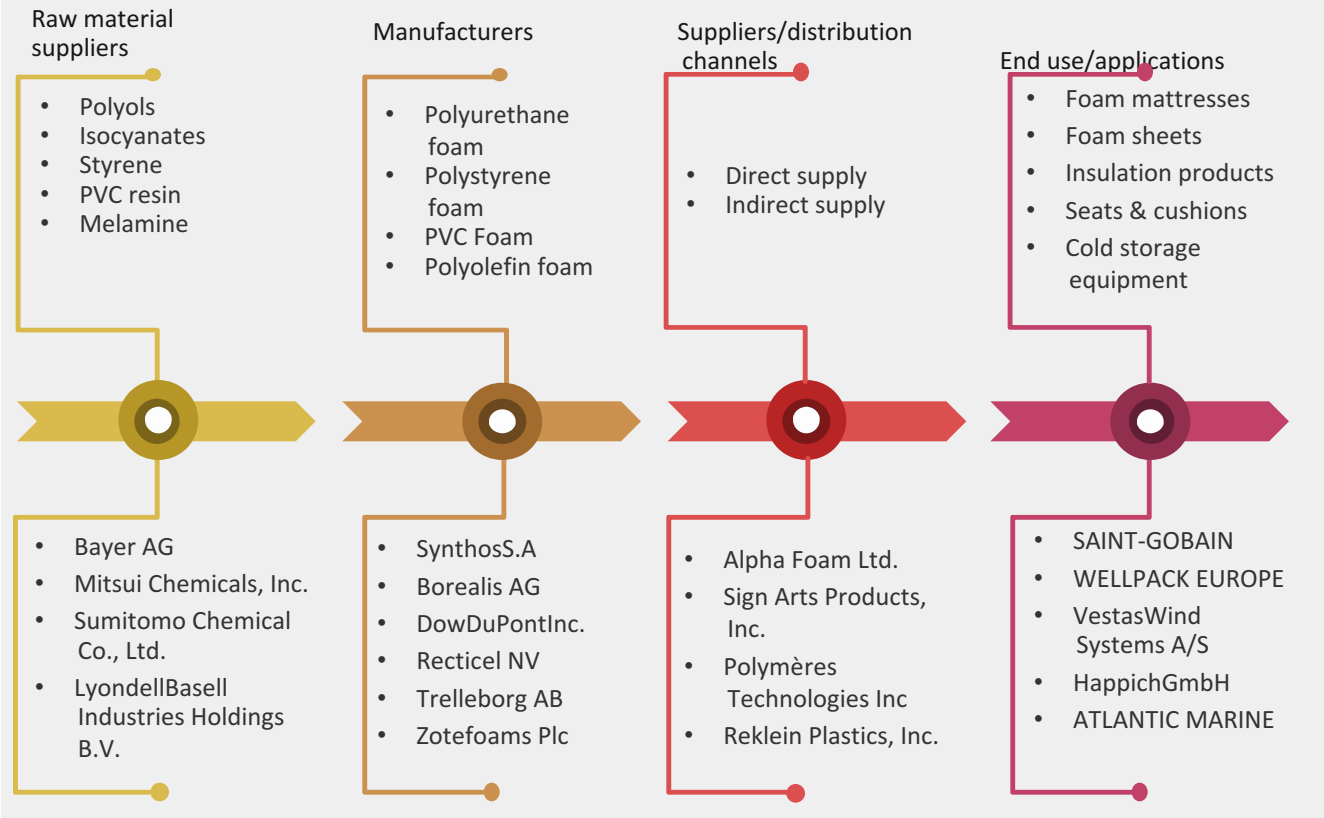
3.3 Polymer foam value chain analysis

FIG. 4 Polymer foam value chain analysis



Source: GREA, EUROPUR, PFA, OICA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polymer foam value chain consists of raw material suppliers, blowing agents, catalysts, flame retardants and other specialty additives; polymer foam producers, polymer foam distributors, and end users. Some of the key raw material producers involved in the polymer foam value chain include BASF SE, Bayer AG, Mitsui Chemicals, Inc., Sumitomo Chemical Co., Ltd., and LyondellBasell Industries Holdings B.V. The aforementioned raw material suppliers are primarily engaged in the production of toluene di-isocyanate (TDI), Diphenylmethane diisocyanate (MDI), polyester polyols, polyether polyols, styrene, polyvinyl chloride, and blowing agents.

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BASF, one of the raw material suppliers, informed its TDI customers that a grade of TDI manufactured between 25th August and 29th August of 2017 may contain levels of dichlorobenzene significantly higher than the standard impurity levels. As a result, in October 2017, many flexible polyurethane foam producers and end users such as Recticel NV, Carpenter Co., and Vita (Lux III) S.a r.l. have announced temporary production stoppages of polyurethane foam products. This has resulted in the demand and supply disequilibrium in Europe flexible polymer foam market. Owing to such factors, many raw material suppliers consider supplying quality raw material as a part of their value chain.

Raw material suppliers such as BASF, Bayer, and DowDuPont own a majority of the raw material supply and the global pricing of the raw materials are in synchronous with the selling prices of these suppliers. As a result, PU foam manufacturers such as Recticel NV, Rogers Corporation, Koepp Schaum GmbH (a subsidiary of Vita (Lux III) S.a r.l.) are looking to integrate backward and reduce their dependence on raw material suppliers.

BASF, Borealis are among the largest producers of melamine in Europe. According to World Health Organization, when concentration of melamine exceeds the threshold exposure limit, it has adverse effects on human health. Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) of Europe, provided guidelines to the manufacturers and users of melamine. Complying with REACH regulations, is a key criterion across the value chain of melamine producers such as BASF and Borealis.

Traditionally, the low melt strength of polyolefin foams, particularly polypropylene, limited the growth of polyolefin foam market. Several technologies including post reactor radiation method, compounding modifiers method have been introduced by distinct polyolefin manufacturers, such as Borealis and LyondellBasell Industries Holdings B.V., to improve the strength of polyolefins in order to meet the requirements in wind energy applications such as spar webs and shell panels, and in marine applications such as vibration control and cushion seats. As a result, manufacturing polyolefin foams with enhanced physical properties and low environmental impacts is of key importance in the value chain for polyolefin foam manufacturers.

For end users, developing application-specific products that enhances the overall performance of the end product made of polymer foam in building & construction, packaging, marine, wind, and rail applications is of key importance across their value chain.

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3.4 Raw material trends

3.4.1 Polyols

Raw materials used in the production of polyurethane foam are mainly polyols and isocyanates. These compounds have multiple alcoholic (OH) groups. Polyether polyols are used for producing polyurethane foams owing to their wide range of viscosity and high molecular weight. Some of the polyether polyols include polytetramethylene glycol, polypropylene glycol, and polyethylene glycol. Polyester polyols can also be used for the production of polyurethane foams; however, polyether polyols have proven to be cost-effective and, therefore, have gained considerable prominence.

3.4.2 Isocyanates

Among isocyanates, supply and prices of TDI have been fluctuating significantly over the last five years owing to the volatile crude oil prices. According to ICIS, in 2018, production shortages across various TDI production plants of BASF resulted in supply tightness in the global markets. As a result, the price of TDI in the U.S. has increased from 170 cents/lb. in November 2017 to 260 cents / lb. in June 2018. This factor is expected to create hindrance to manufacturers during raw material procurement. The supply-demand trend of the raw materials is likely to have a major impact on all polymer foam manufacturers over the next few years.

3.4.3 Styrene

Polystyrene foams are made from the polymerization of styrene compounds, which are derived from natural gas and petroleum. In order to form low-density polystyrene foams, styrene compounds are suspended in water after which a suspending agent, such as precipitated barium sulfate and methacrylic acid, is added. Chlorofluorocarbons are used as blowing agents to expand the polystyrene into expanded polystyrene foam. Technological advancements have led to the development of alternative blowing agents, such as methyl formate, which are not harmful to the environment without compromising on the strength and smoothness of the foams. The demand and supply trend of styrene compounds in Asia is expected to be in equilibrium owing to the increase in the new capacity additions by 2020 in Asia and the Middle East.

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3.4.4 PVC Resin

PVC resin is the main raw material used in the production of PVC foams. Among the other raw materials that are commonly used in PVC foam production are stabilizers, foaming agents, foam regulator, fillers, and pigments. Various metal compounds such as calcium, tin, lead, and barium are used as stabilizers in the production process to fully plasticize and stabilize the PVC resin. However, owing to the toxic nature of lead, PVC foam manufacturers are voluntarily phasing out its use as a stabilizer. Lead is being replaced by calcium and organic stabilizers.

3.4.5 Melamine

Raw materials such as melamine, formaldehyde, curing agent, and a blowing agent are used in the production of melamine foam, an aqueous solution. Foaming and crosslinking of the melamine foam using high frequency radiation energy forms a thermoset foam, which is more elastic in nature. The solid form of the melamine foam results in a rigid thermoset foam, which has good abrasion resistance.

More than 90% of the melamine produced globally is used in the production of laminates, wood adhesive resins, surface coatings, molding compounds, paper coating and leather tanning agent. The rest of the melamine produced is used as melamine crystal. Owing to its ability to decompose and release nitrogen gas, melamine crystals allow heat to be absorbed and slows down combustion. As a result, melamine crystals are used as flame retardants in flexible polyurethane foam. According to ICIS, in 2017, the prices of melamine in Europe and Asia Pacific increased on account of higher demand and tight supply in the market.

3.5 Technology overview

There are various foaming techniques used in the manufacturing of polymer foams. Some of these techniques include mechanical foaming, physical foaming, chemical foaming, and foaming with hollow glass beads. Among the various foaming techniques mentioned, physical foaming is the widely used technique for large scale production of polymer foams.

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3.5.1 Physical foaming

In this process, a homogeneous mixture is formed by dissolving blowing gas in the polymer under high pressure using metering pump. The subsequent temperature increase or pressure release results in expansion of the gaseous state of the polymer. Traditionally, owing to their low thermal conductivity and low diffusivity, Chlorofluorocarbon (CFC) blowing agents are used in this process to inculcate excellent physical and insulation properties in the resulting polymer foam. However, the use of CFC agents has been diminishing owing to the stringent environment regulations on account of their harmful effects on the ozone layer.

Carbon dioxide, is considered as an alternative to toxic CFC and hydrofluorocarbon (HFC) blowing agents, on account of its various favorable properties such as no toxicity, no harmful effects on the ozone layer and cost competitiveness. However, issues such as low solubility in polymer melts, high gas thermal conductivity and high diffusivity in the polymer melts are challenges that manufacturers will have to overcome over the course of time.

3.5.2 Foaming processes

3.5.2.1 Slabstock foaming

Slabstock foaming is a continuous process where raw materials such as polyol, catalysts (which accelerate the reaction between water and di-isocyanate), water are mixed in combination with additives to form a solution in liquid form and then poured into a polyethylene mold. The liquid in the mold expands into a block of foam. This block is then stored and cooled which allows it to be converted into various shapes. Most of these foams are used in textile laminating, automotive seating, furniture, and mattresses.

3.5.2.2 Extrusion foaming

Extrusion foaming is one of the most widely used processes in the polymer industry. In this process, foaming gas is mixed with a polymer by injecting it in a barrel. Here it mixes with the polymer and forms a homogenous solution. This homogenous mixture passes through a die, where a rapid drop in pressure causes a phase separation which is responsible for the foam creation and expansion.

3.5.2.3 Foam injection molding

In this process, a foaming agent is introduced into the polymer melt stream and the resultant mixture is injected into the mold cavity through nozzles. As the gas enters the mold cavity, expansion takes place and results in a foam formation.

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In 2011, Ford Motors had developed microcellular foams with the help of injection molding process. This was done by making some modifications to the injection molding process by designing new screws in the injection barrel which allows better mixing of the mixture. Controlled use of carbon dioxide helps in the formation of millions of micro-size bubbles in uniform configurations. This process was done in order to reduce the overall vehicle weight and thereby improving the fuel efficiency.

The continuous research and development in polymer foam manufacturing technology has allowed foaming of several polymer materials. These materials have excellent properties such as energy dissipation, insulation, comfort, convenience, buoyancy, and weight reduction. Although the choice of manufacturing processes depends on the type of applications, cost of goods sold, and ease of production.

3.6 Regulatory Framework

The global polymer foam market is subject to numerous regulations, guidelines, and restrictions regarding polymer production and its applications owing to the toxic nature of raw materials such as isocyanates, coupled with certain health hazards of improperly disposed products and over-exposure to chemicals contained in these foams.

Major regulatory policymakers in the global polymer foam market include U.S. FDA (Food & Drug Administration), U.S. EPA (Environment Protection Agency), European Commission, REACH (Registration, Evaluation, Authorization, & Restriction of Chemicals), and ECHA (European Chemicals Agency). Certain policies such as the Energy Efficiency Directive in the EU are serving to encourage polymer foam application in building insulation to reduce energy consumption and promote savings.

REACH under the directive 1999/45/EC to control exposure to hazardous chemicals present in polymer foams. The EU publishes a risk assessment report that studies the environmental and health risks posed by MDI, and implements risk reduction procedures and measures. The agency also evaluates the risks posed by other isocyanates such as TDI and even polyols, along with the risk of improperly disposed polymer foams.

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ECHA identifies organophosphate flame retardants used in the production of flexible polyurethane foam as hazardous. According to ECHA's EC number: 204-118-5 , 237-158-7, 237-159-2, Tris (2-chloroethyl) phosphate (TCEP), Tris(2-chloro-1-methylethyl)phosphate (TCPP), TCPP is an all-round flame retardant for all types of flexible PUR foams with a registered volume under REACH of 10 000-100 000 tonnes/year. The registered volume of TDCP under REACH is 1 000 – 10 000 tonnes per year. TDCP is more expensive and is used mainly for automotive applications. TCEP is currently not used in the EU, but may be present as an impurity in other commercial flame retardants or in imported articles.

3.6.1 TCEP

The EU RAR (2009) summarised the available information on reproductive toxicity as follows:

"Tris(2-chloroethyl)phosphate treatment revealed significant impairment of fertility for both sexes during continuous breeding and for two successive generations in mice. Reproductive failure was observed at daily doses of 700 mg/kg bw with at best and no more than 3 litters produced and with no pups surviving from the last litter produced. The findings were essentially confirmed from the results of a separate cross over mating trial in mice at the same dose level. The reproductive system of male mice appeared to be more sensitive to tris(2-chloroethyl)phosphate treatment as evidenced by less successive reproduction of treated males in comparison to treated females and further by significant male reproductive organ weight reduction and sperm parameter impairment in mice of two different strains. Based on a statistically significant reduction of the number of litters produced by the F0 generation, reduced pregnancy and fertility indices in the F1 generation, and statistically significantly reduced litter size in both the F0 and the F1 generations a NOAEL/fertility of 175 mg/kg bw/d was derived from the study in CD-1 mice with oral administration (Gulati and Chapin, 1991).

Based on the available animal data tris(2-chloroethyl)phosphate is identified as a reproductive toxicant with a significant toxic potential adverse to fertility. Treatment of mice resulted in significant impairment of reproductive success of both sexes and of male reproductive organs and of sperm parameters. Therefore, tris(2-chloroethyl)phosphate will be classified and labeled as reproductive toxicant Cat. 2, R60. No significant toxicity to embryo-/fetal development has been revealed from tris(2-chloroethyl)phosphate treatment of pregnant rats.

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3.6.2 TDCP

The Draft EU Risk Assessment (EU RAR 2008b) summarised the available information on carcinogenicity toxicity as follows:

"In a 2-year carcinogenicity study, in which groups of 60 male and 60 females rats were fed diets containing TDCP to achieve dose levels of 0, 5, 20 and 80 mg/kg/day, there was a significant increase in the incidence of renal cortical adenomas in mid and high dose animals at 24 months. There was no increase at 12 months. The incidence of benign testicular interstitial cell tumours was also increased in the mid- and high-dose animals at both 12 and 24 months. Hepatocellular denomas and adrenal cortical adenomas were statistically increased in the high dose animals at 24 months."

The Danish Ministry of the Environment (Danish Environmental Protection Agency) also enlists substances of concern, use of which should be reduced or eliminated completely, as a guideline for enterprises. MDI and TDI are classified as suspected carcinogens and in addition to this, MDI is classified with R48 (Danger of serious damage to health by prolonged exposure) as per the Dangerous Substances Directive (67/548/EEC). Innovative R&D initiatives to develop Non-Isocyanate Polyurethane (NIPU) are being supported by numerous patents to overcome these obstacles.

The U.S. EPA has set standards under the Code of Federal Regulations (CFR), title 40, chapter 1, sec. 63 for molded and slab stock flexible PU foam production, to reduce Hazardous Air Pollutants (HAP) APA emissions from production lines. PU foam manufacturers are, thus, required to comply with these standards on a rolling annual basis or even on a monthly basis.

In March 2013, the Occupational Safety and Health Administration (OSHA) announced a new National Emphasis Program (NEP) in order to protect workers from the detrimental health effects of occupational exposure to isocyanates. According to the NEP, workers in a wide range of industries and occupations are exposed to at least one of the numerous isocyanates known to be associated with work-related asthma. A list of relevant industries by the North American Industry Classification System (NAICS) codes or Standard Industrial Classification (SIC), where isocyanate exposures are known to occur, is established in Appendix A of the NEP.

Other toxicity issues associated with the bioaccumulation of flame retardants, threat to aquatic life, and side effects of isocyanates and catalysts have attracted numerous other legislation across numerous countries.

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3.7 Polymer foam market dynamics

The increased emphasis by various countries to reduce the dependence on fossil fuels and GHG emission levels has led to the burgeoning growth of renewable energy sector across the globe and implementation of energy efficiency improvements in the building. As a result, polymer foam manufacturers are witnessing significant demand from wind energy OEMs. However, on account of significant shortage of raw materials, the supply levels often fail to meet the increase in demand for polymer foam from end users. However, in the coming years, the supply is expected to meet the demand owing to the increase in the production capacities by the manufacturers.

Polymer foams are also expected to undergo changes in terms of their production or processing technology, owing to shift in the trend towards the development of sustainable and renewable materials. Several manufacturers are also taking initiatives to comply with regulations and phase out toxic chemicals such as isocyanates (MDI, TDI). In 2004, BioFoam, an EU project, developed industrial foams made of polyesters and polyester urethane, utilizing a natural oil-based feedstock, to reduce global carbon footprint by replacing conventional petroleum-based materials and products.

Green chemistry has been an important feature for polymer foam developers, with growing interest in renewable raw materials for polymer foam production. Enzymes and natural catalysts in several biodegradable foam products have replaced conventional catalysts and eliminated toxic blowing agents. For instance, manufacturers such as Foam Supplies, Inc., General Plastics Manufacturing Company, and Greiner MULTIfoam GmbH are producing chlorofluorocarbon (CFC)-free and environment-friendly polyurethane foams.

The technological advancements in the foam applications such as the development of metallic foams, pose challenges to the growth of the market. Aluminum foams, owing to their properties such as light weight and high strength, are gaining widespread acceptance in rail applications. However, aluminum foams are not currently produced on large scale. The commercial-scale development of aluminum foams in the coming years may replace a significant share of polymer foam market.

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FIG. 5 Polymer foam market dynamics

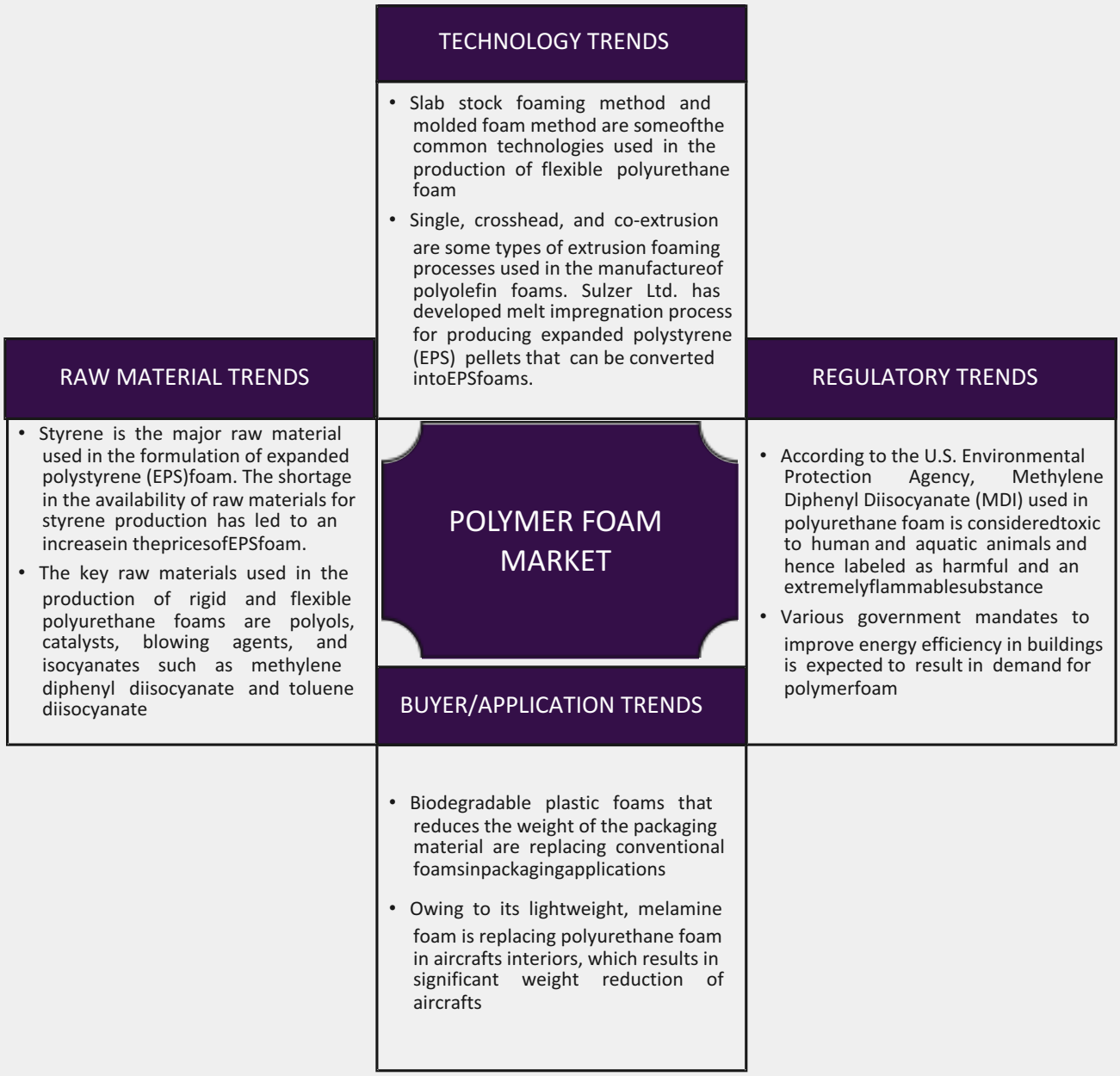

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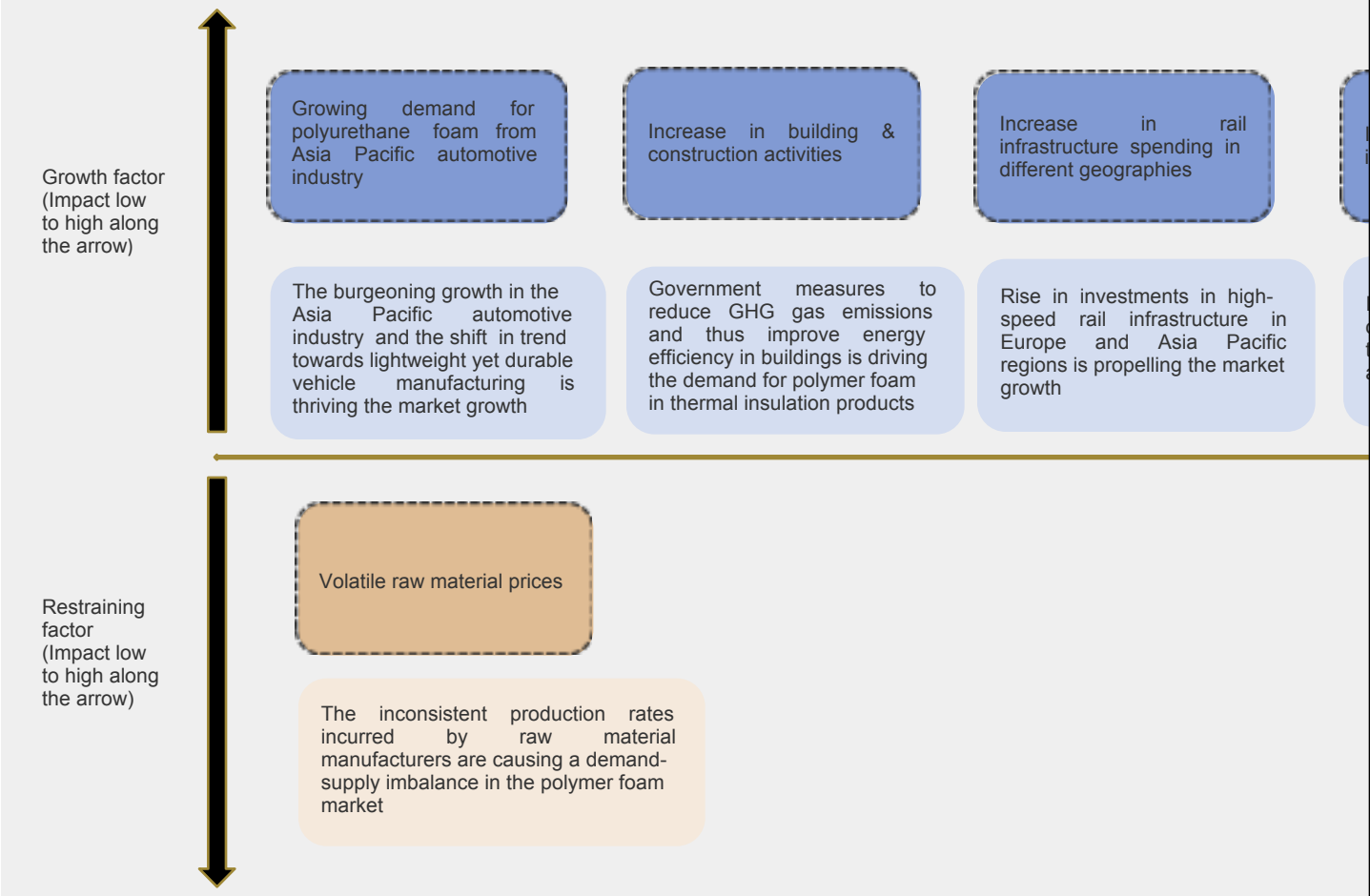
FIG. 6 Polymer foam market trends & outlook



Source: GREA, EUROPUR, PFA, OICA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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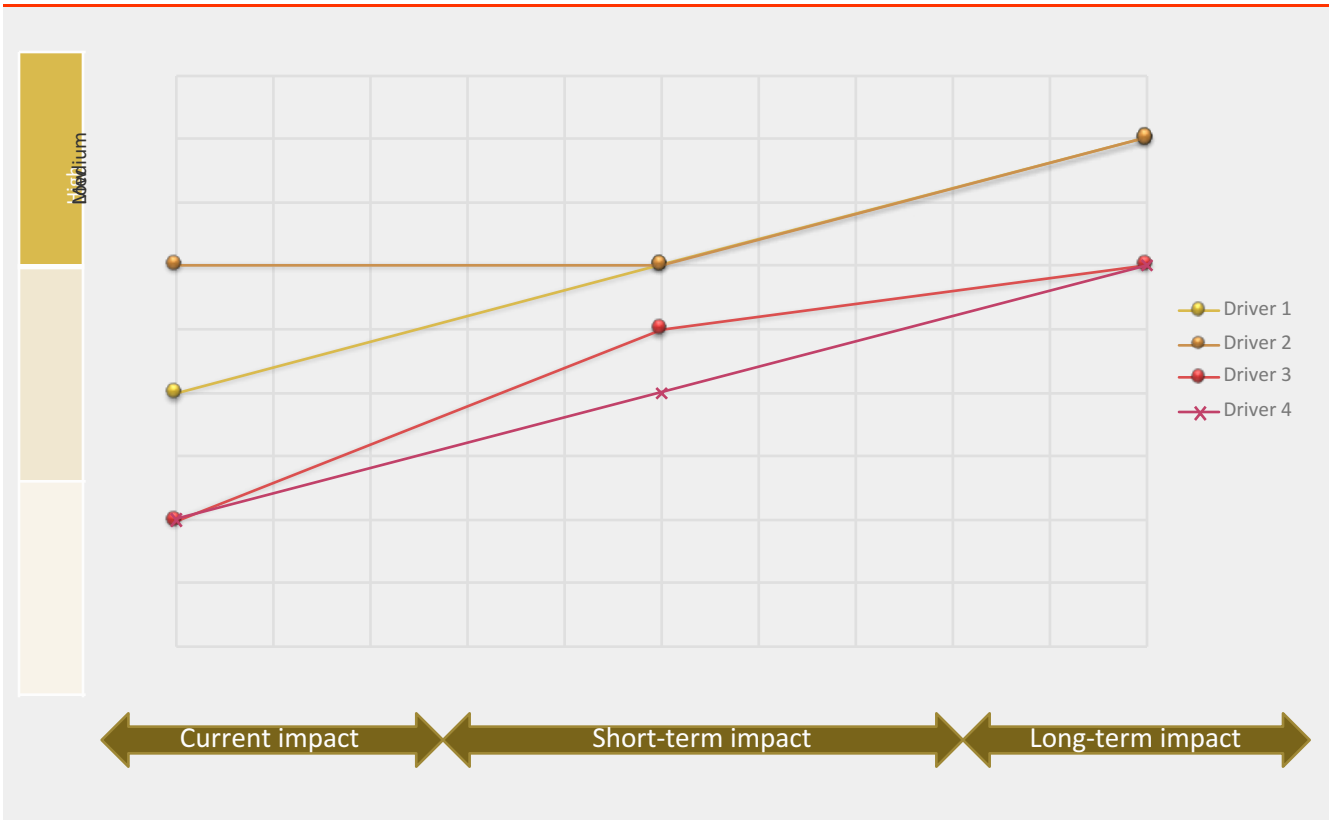
3.8 Polymer foam market driver analysis

FIG. 7 Polymer foam market dynamics



Source: GREA, EUROPUR, PFA, OICA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

3.8.1.1 Growing demand for polyurethane foam from Asia Pacific automotive industry

The global automotive industry has been experiencing a considerable growth, reaching prerecession economic levels in some regions. Since 2014, there has been a positive outlook in the automotive sector ranging from developed countries such as the U.S. to developing countries such as China & India. Growing population, in emerging economies of Asia Pacific, coupled with rising disposable income and increases in purchasing power parity in this region is expected to drive demand for automobiles over the forecast period.

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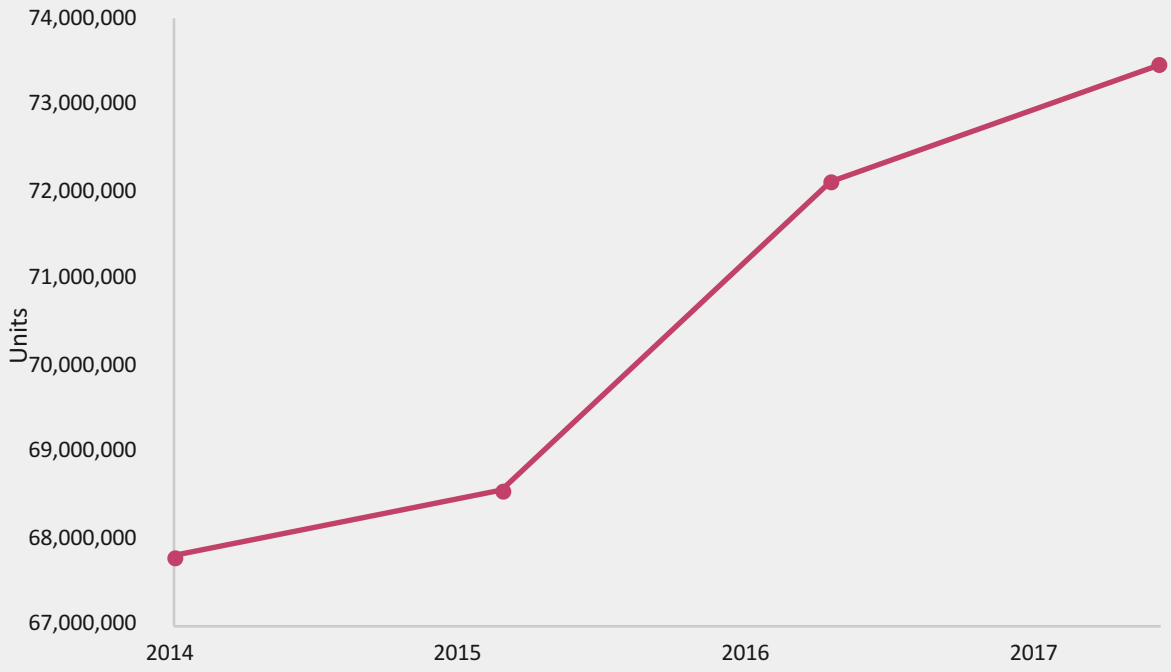
FIG. 8 Global cars production (in Units)



Source: GREA, EUROPUR, PFA, OICA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to International Organization of Motor Vehicle Manufacturers (OICA) as compared to 2014, global passenger car sales have witnessed considerable growth from 69,970,045 units in 2014 to 74,399,390 units in 2017. Transitioning lifestyles and wide availability of low-end sports models have positively impacted automotive demand during the period from 2014 to 2017. Easy financing of automobiles owing to the EMI concept with attractive interest rates made it simpler and affordable for a medium income group consumer to purchase a vehicle of their choice. Easy availability of loans for vehicle purchase has also affected vehicle sales on similar lines. The aforementioned factors played an important role in propelling the growth of the automotive industry both in developed as well as developing regions and the trend is likely to continue until 2025.

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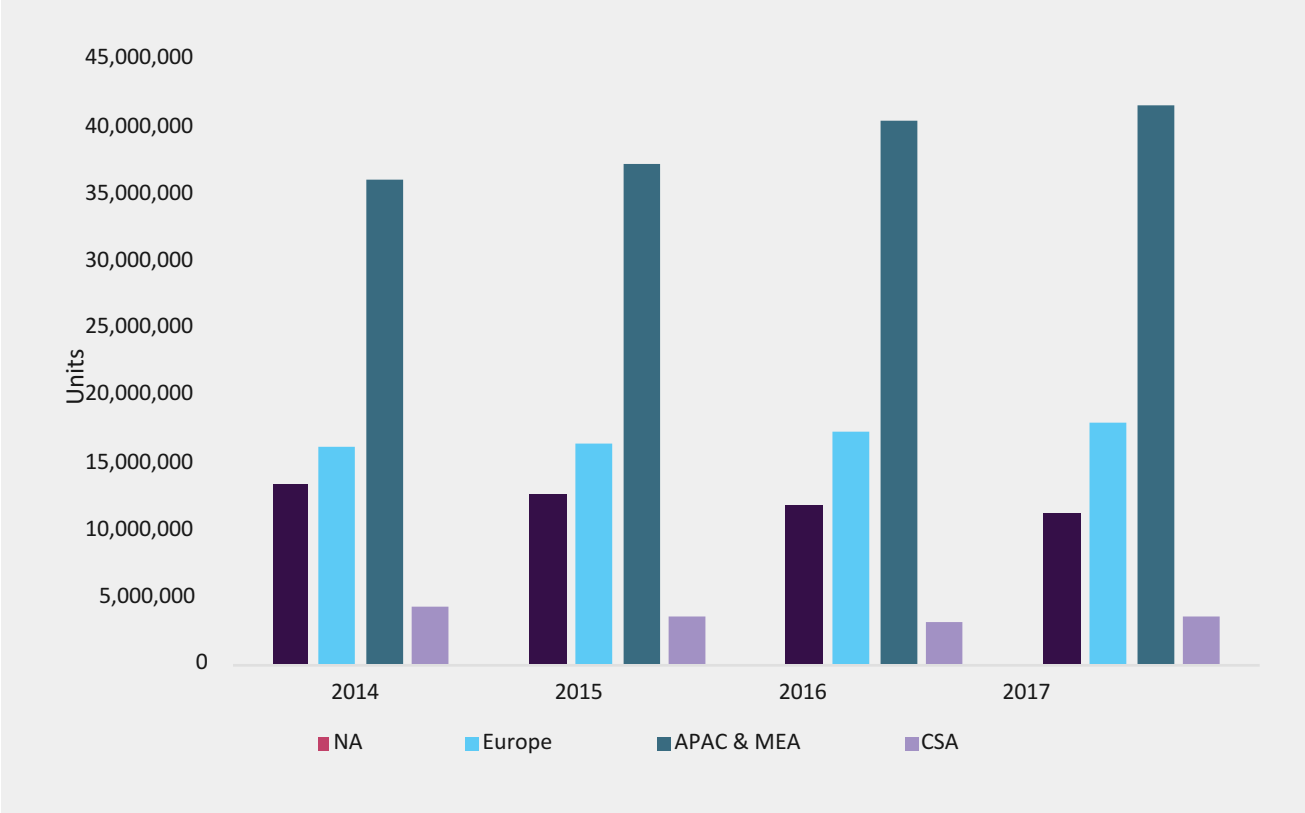
FIG. 9 Global sales of passenger cars (in Units)



Source: GREA, EUROPUR, PFA, OICA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to OICA, the global cars production was estimated at 67,782,035 units in 2014 and increased to 73,456,531 units by 2017. High GDP growth rate in countries such as China, India, Thailand, Indonesia, and other South East Asian countries is contributing to the expansion of the automotive sector. Asia Pacific, as observed from the graph below, is expected to be the largest & fastest growing region over the next eight years. Subsequently, as per International Energy Agency, owing to the increase in the utilization of automobiles, global carbon emission level increased from 32.3 billion metric tons in 2014 to 37 billion metric tons by 2017. The alarming growth rate of these levels has prompted global governments and federal agencies to implement strict guidelines and regulations regarding emissions from the automotive industry.

Increasing environmental concerns and stringent pollution control norms have forced automotive component manufacturers to reduce carbon emission levels. One of the most important factors affecting fuel efficiency and vehicular pollution is the kerb weight, reduction of which drastically increases fuel efficiency and eliminates pollution.

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In addition to weight reduction, providing comfort to an individual is one of the key factors to the automotive seat manufacturers. Various factors such as foam density, tensile strength, elongation, hardness and vibration dampening are considered while designing the car seat. Polyurethane (PU) foams are durable, lightweight, versatile, resistant to corrosion and vibration, recyclable, and offers high level of freedom in geometric design.

PU foams are thus increasingly being used in various passenger car seat cushions, gasket seals, arm rests, head rests, cushioned instrument panels, airbags, and other components to create lightweight, fuel-efficient, and durable structures. Owing to the above factors and their broad application scope, polyurethane foams are expected to witness significant demand in the Asia Pacific automotive industry.

3.8.1.2 increase in building & construction activities

Polyurethane foams can contribute to reducing carbon emissions that lead to global warming by providing insulation to the buildings. Some of the common application areas of polyurethane foams in buildings are pipes, roofs, cavity walls, and floors. According to the European Trade Association of diisocyanates and polyols (ISOPA), more than 40% of the fossil fuel based energy is associated with heating and cooling of buildings. As a result, wider usage of polyurethane foams in building insulation applications is expected to result in significant reduction of CO_2 emissions across the globe.

The rising construction sector in light of rapid urbanization, rising population, and government infrastructural plan will augment market growth. In addition, infrastructure development related to mega sports events including Summer Olympics in Tokyo and Football World Cup in Qatar is expected to promote industry growth by 2020. Rising commercial building activities, particularly in Asia Pacific, Europe, and Africa is anticipated to propel demand over the forecast period.

The growing infrastructure sector in India and China on account of favorable regulatory support to improve infrastructure is expected to promote growth in the near future. For instance, According to the Make in India Initiative, in May 2015, the government of India allocated USD 1.2 billion for the construction of 100 smart cities by 2020, which is expected to boost the construction sector in India.

In China, the National New-Style Urbanization Plan (2014-2020), focuses on the integration of urban and rural development by investing in construction projects and promotes energy efficiency by setting energy intensity reduction targets in building & construction industry. Financial incentives, minimum efficiency standards, energy efficiency labels and green housing policies are implemented by the regulators in China to meet the energy intensity reduction targets.

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China's sustained demand for industrial, residential, and infrastructural expansion has generated a requirement for new construction projects. The adoption of Western Development Plan in 2000 by the government of China has resulted in infrastructural development at the domestic level. As part of the Western Development plan, 12 provinces which include Guangxi Inner Mongolia, Yunnan, Xinjiang, Tibet, Chongqing, Shaanxi, Guizhou, Ningxia, Sichuan, Gansu, and Qinghai are expected to receive to financial support for infrastructure construction. As part of the plan, more than USD 900 billion were invested in over 300 projects between the period 2000 and 2016. According to the China National Development and Reform Commission, in the year 2016 alone, USD 108 billion were invested in the in more than 30 projects across the aforementioned 12 regions.

Malaysia is expected to witness strong growth in infrastructure with the implementation of projects under the government's "Economic Transformation Program (ETP)". The ETP program identified 12 National Key Development Areas (NKDA) as a means to achieve economic development by 2020. One of the 12 NKDAs, being infrastructure industry, polymer foams demand is expected to increase in the coming years.

In North America, Mexico is expected to witness significant demand for polymer foam on account of increased infrastructure expenditure by government. Under the National Infrastructure Plan of Mexico, the government planned an investment of USD 590 billion from 2014 to 2018, which is anticipated to promote construction of residential and commercial structures. Population growth, urbanization, and rising disposable income in Mexico are expected to play an important role to stimulate growth.

Africa is expected to witness growth on account of rising foreign direct investments in real estate and hospitality coupled with construction of new residential as well as non-residential buildings. In 2012, African Union Commission laid down an infrastructure plan of the North-South Corridor. This plan was intended for infrastructure development at a domestic level. In addition, ongoing National Development Plan will augment the construction sector in the near future. All the aforementioned construction projects taken up by various countries across the globe are expected to provide lucrative growth opportunities to polymer foam manufacturers over the forecast period.

3.8.1.3 Increase in rail infrastructure spending in different geographies

The increasing preference for lightweight materials in railway industry is driving the demand for polymer foam materials among the North American, Asia Pacific and European countries. A foam core bonds several polymers and results in a significantly reduced weight, yet a high-strength finished product. The broad range of foam application areas such as seats, panels, and dampeners in urban and high-speed rail is expected to drive the market growth.

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Investment in railway infrastructure is expected to be high in developed economies, particularly in urban & high-speed rail, with urban population in Western Europe preferring public transport. Following a slump during the period 2010 to 2013, many countries in Western Europe, such as Spain, the UK, and France, are expected to witness renewed investments in the coming years.

The European Union developed transport policy and cohesion policy to facilitate financial support to the high-speed rail infrastructure in Europe. The European Commission's TRANSFORUM project, was a part of the European transport policy, which was rolled out with an aim to triple the existing high-speed rail network by 2030. According to the European Union, since 2000, over USD 27 billion was allocated to develop high-speed rail infrastructure with over 90% funds allocated to Spain, Portugal, Germany, Italy, Greece, France, and Poland, with Spain receiving the largest share of funds. As a result, polymer foam manufacturers are expected to witness substantial growth opportunities in the aforementioned countries.

In addition to European countries, American and Canadian governments have also made substantial investments since 2010 to develop railway infrastructure. However, the growth in the development of rail infrastructure in North American countries is expected to be moderate as compared with European countries.

Among the Asia Pacific countries, China and Japan are at the forefront in investing in high-speed rail infrastructure. In 2017, China Railway Corporation invested USD 111.4 billion in 2017 to expand its high-speed rail network, while in 2018, it has announced an allocation of USD 112.4 billion for the expansion project. The investments are a part of China's national plan to expand its high-speed railway network from 25,000 km in 2017 to 38,000 km network by 2025. Investments are expected to continue to increase till 2025 to reach the anticipated rail infrastructure establishment targets. On the whole, the polymer foam demand from the rail industry is expected to grow on account of the railway infrastructure expansion projects.

3.8.1.4 increase in wind turbine installations

According to Global Wind Energy Council (GWEC), the drastic decline in the offshore and onshore wind energy prices in various countries including Mexico, Canada, India, and China has led to the emergence of wind energy as a sustainable source of power since 2000. The increase in the capacity additions was particularly seen on account of rapid installations of wind turbines in China in 2015. The trend is expected to continue over the forecast period, thereby presenting lucrative growth opportunities to PVC and other polymer foam manufacturers.

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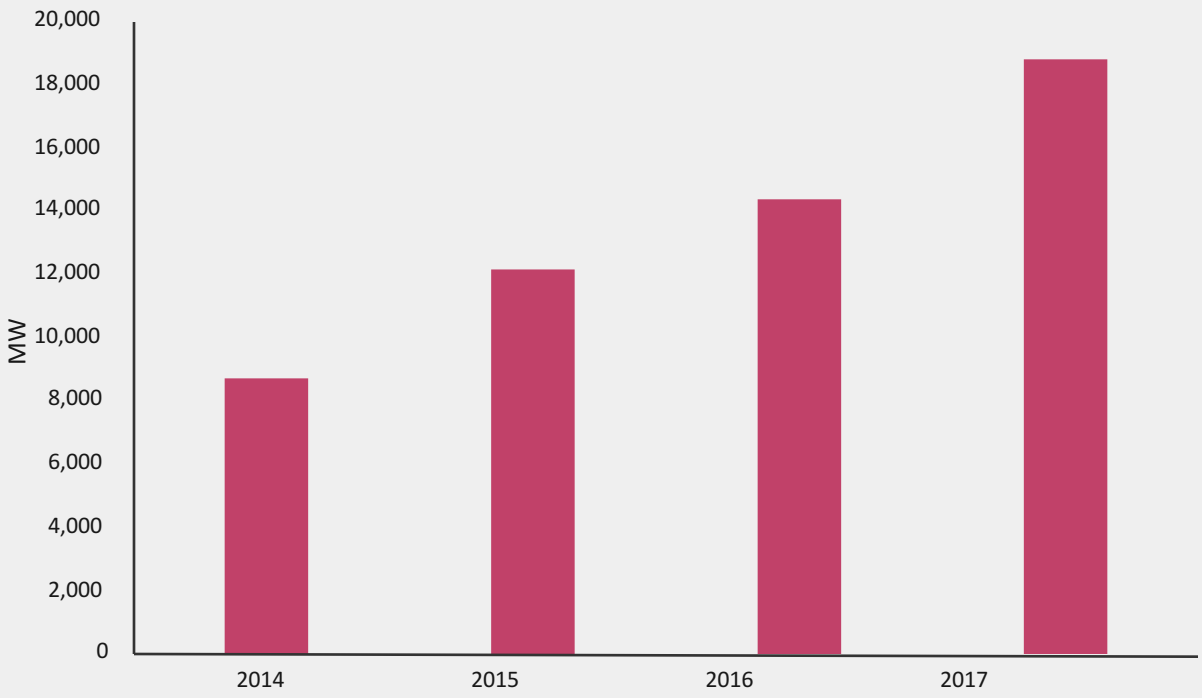
FIG. 10 Global offshore wind energy capacity (in MW)



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Various subsidies and initiatives taken by distinct governments across the world had played a significant role in aiding the growth of offshore wind energy market. According to the Global Wind Energy Council, the offshore wind capacity increased from 8,724 MW in 2014 to 18,814 MW by 2017. The increase in the offshore wind energy capacity additions was spearheaded by European countries, which accounted for over 84% of the global offshore wind installations as of 2017. According to GWEC, UK is the one of the largest market for offshore wind energy, accounting for a market share of 36%, which is followed by Germany and China with a share of 28.5% and 15% respectively. Since 2011, the expansion of wind energy industry has complemented the growth of many wind turbine manufacturers such as Vestas Wind Systems AS, Siemens AG, LM Wind Power, and others.

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According to the American Wind Energy Association, the offshore wind energy turbine manufacturers are shifting its focus toward manufacturing turbines that produce more power at a competitive cost and have longer life cycles at minimal maintenance interventions. However, larger turbines pose a challenge by increasing the overall weight of the turbine blade, making the installation difficult. To offset this problem, the turbine manufacturers have developed several composite materials including polymer foam to make lightweight turbine blades that are easier to assemble and maintain. This particular shift in trend toward lightweight, yet strong large turbines has led to the growth of polymer foam materials.

Since 2011, the wind turbine manufacturing market witnessed a rise in the demand for various composite materials such as balsa, honeycomb, PVC Foam, styrene acrylonitrile (SAN) foam, and polyethylene terephthalate (PET) foam. Balsa, on account of its high density, mechanical properties, and stiffness, is the widely used material in the root section of turbine blade, followed by SAN and PVC. However, various drawbacks associated with balsa, SAN, and PVC composite materials had led to the emergence of PET foam.

Foam materials are preferred in the shear web and blade shell portions where firmness, light weight, and high strength are essential requirements. Among the various foam materials used, the use of PET foam is evolving on account of various reasons such as ease of extruding foam with desired mechanical properties, its recyclability, its compatibility with other materials, and its cost competitiveness.

As the offshore wind energy industry expands, the increase in demand for long life cycle turbine blades with minimal maintenance is also of significant importance in this scenario. This puts an emphasis on the turbine blade manufacturers to use quality and standard foam products that enhance the service life of the turbine blade. Polymer foams assists wind turbine manufacturers to comply with the desired quality requirements and thus enhance the large-scale production of wind turbine components in less time to meet the rapid growth pace of wind energy industry.

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3.8.2 Market restraints analysis

Market restraint	2014-18	2019-21	2022-25
	Impact		
Volatile raw material prices			

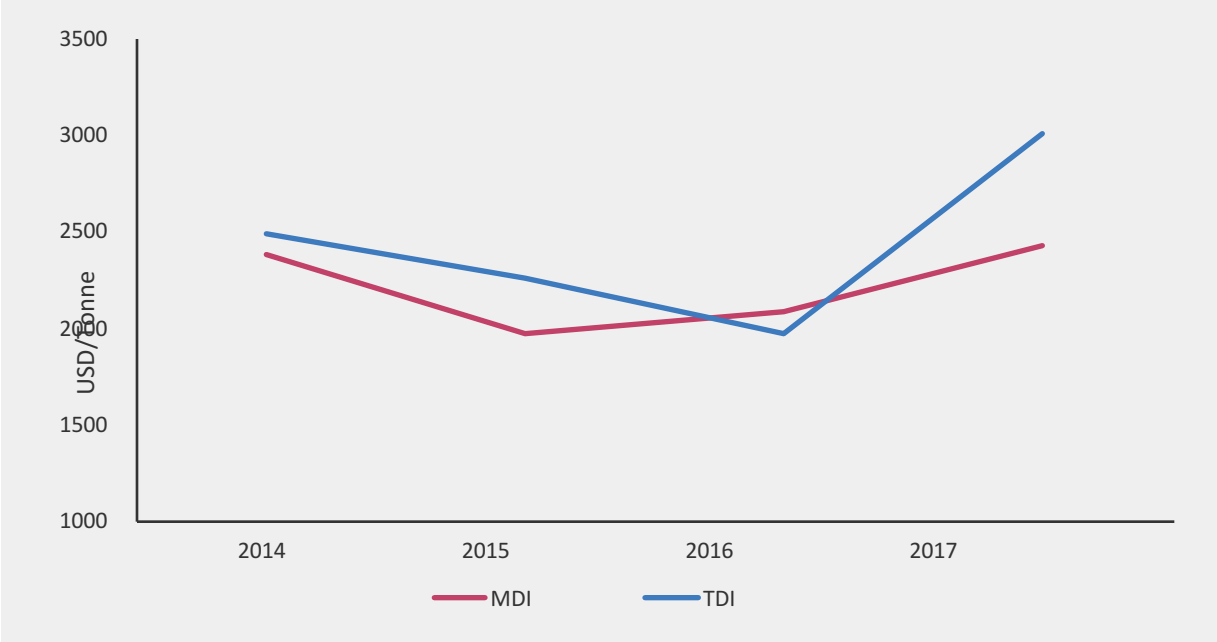
Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

3.8.2.1 Volatile raw material prices

Polyols are mainly used for producing polymer foams. MDI and polyols are used for rigid foam production. The supply and prices of these raw materials have been fluctuating significantly since 2005 owing to volatile crude oil prices. Manufacturers in the market are projected to face a challenge in terms of raw material procurement on account of this factor.

TDI and polyols were oversupplied in the recent past with major capacity expansions of companies such as BASF SE (Germany), Bayer (Germany), Fujian Southeast Electrochemical Co. Ltd. (China), and Sadara Chemical Company (Saudi Arabia). The market witnessed closure of several units, such as Mitsui Chemicals closing its TDI manufacturing plant in Germany in 2014. Such developments in the market are projected to compel manufacturers to reassess their raw material procurement strategy.

FIG. 11 Europe Isocyanates Prices (USD / Ton)



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The market is expected to face raw material supply instability over the coming years owing to uncertain operation rates and plant closures by TDI manufacturers. Polyurethane (PU) foam is the largest application area for TDI and MDI and the TDI and MDI growth depends on the development of PU foam industry. In 2017, the European market witnessed an upward trend in the prices due to the non-availability issues on account of planned maintenance by European manufacturers. MDI prices are expected to rise owing to supply contraction along with several companies divesting from their production and higher demand from end users. Thus, volatile raw material prices may pose challenge to the growth of polymer foam market over the forecast period.

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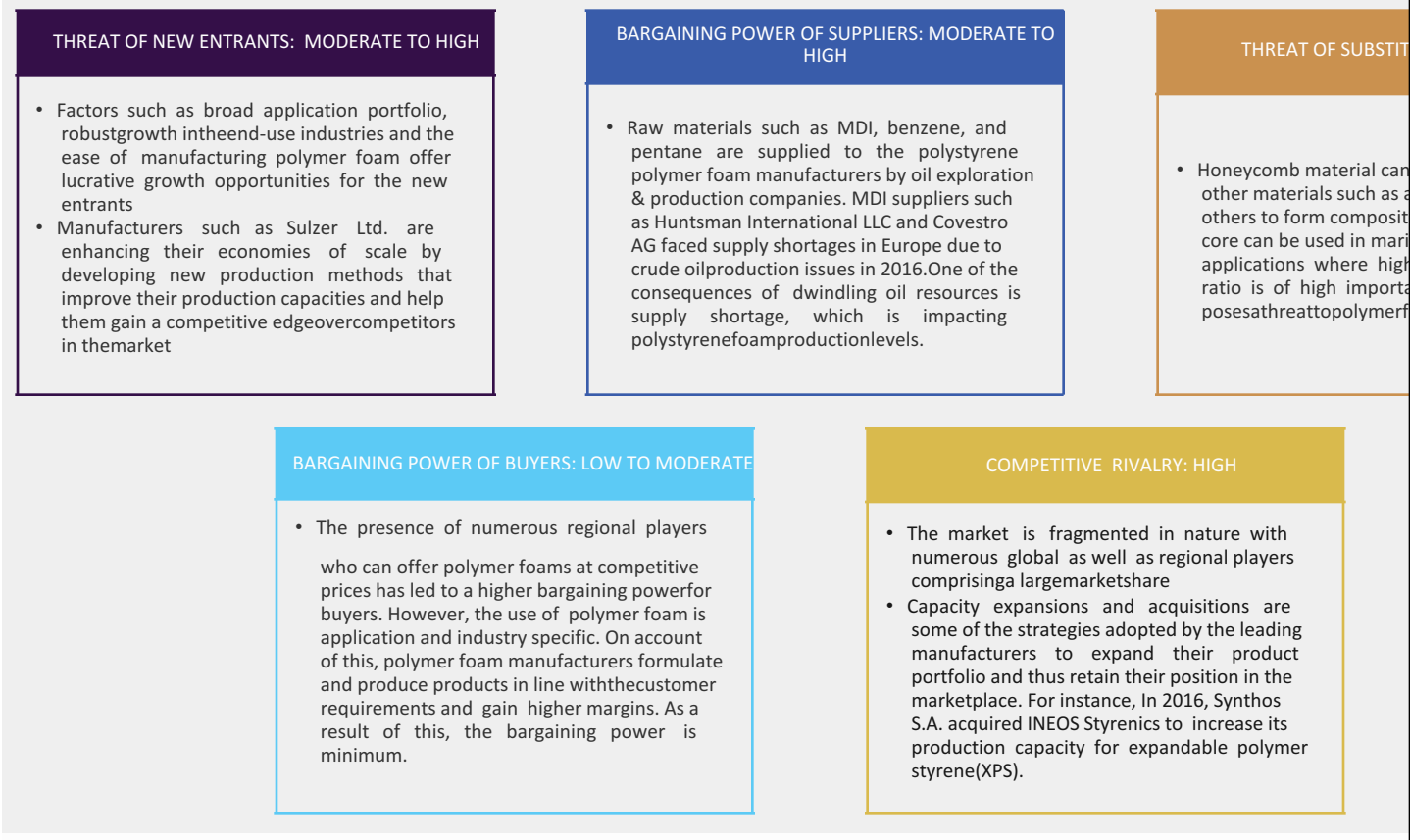
3.9 Polymer foam market Porter's analysis

FIG. 12 Polymer foam market Porter's analysis



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

1 –3 ---> Weak market forces	4 –6 ---> Medium market forces	7 –10 ---> Strong market forces

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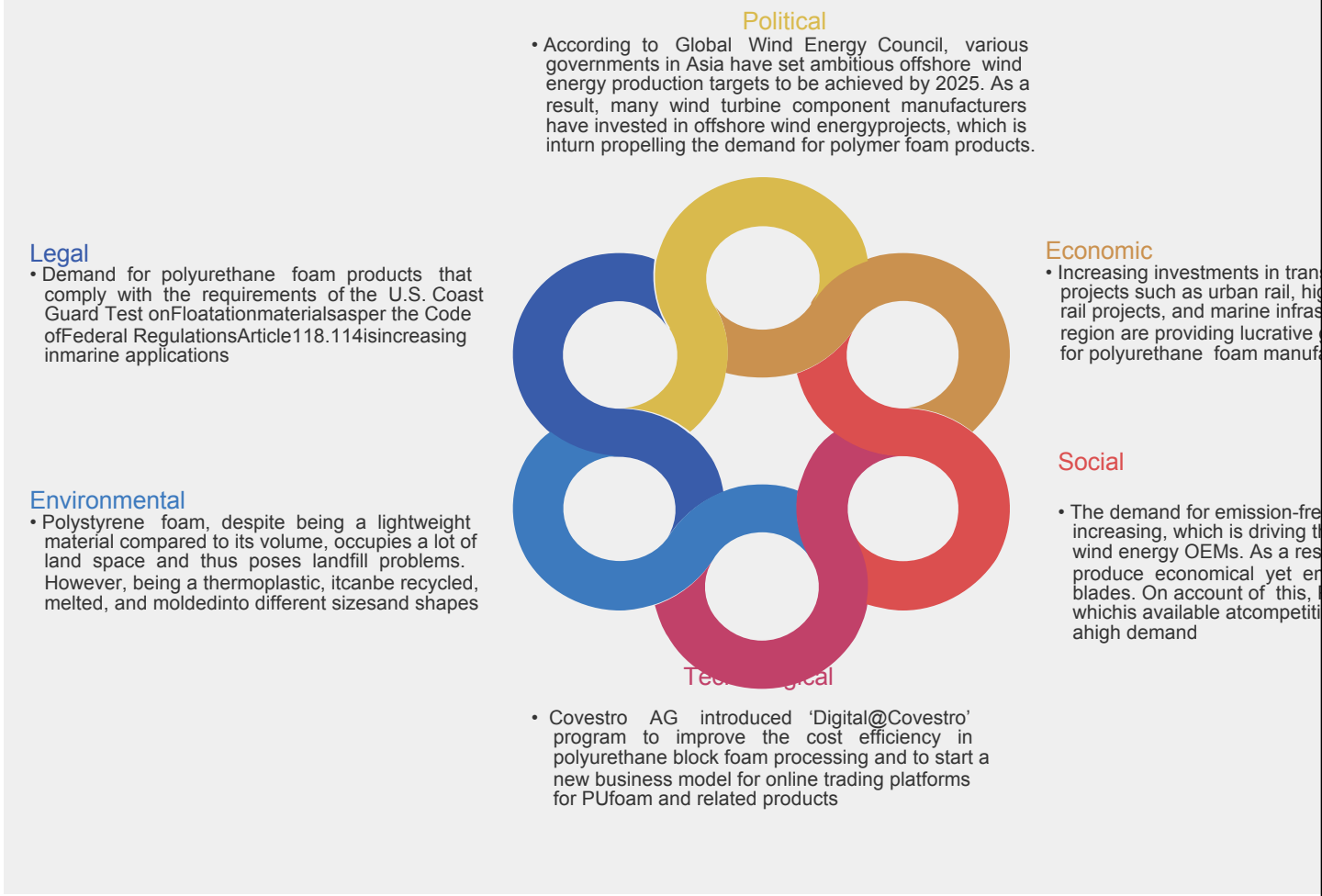
3.10 Polymer foam market PESTEL analysis

FIG. 13 PESTEL analysis



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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CHAPTER 04

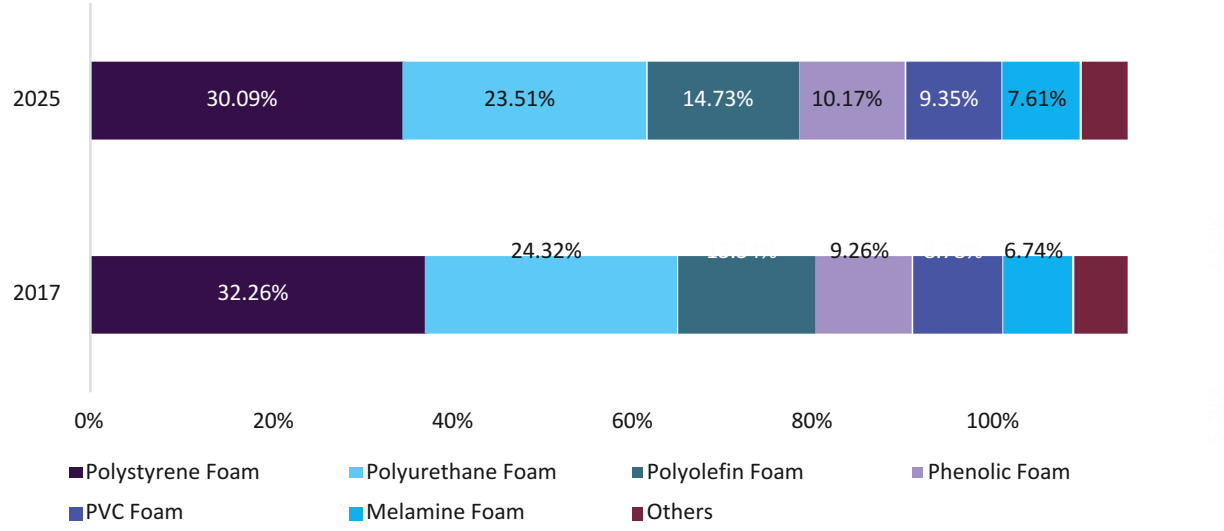
Polymer Foam Market: Type Estimates & Trend Analysis

4.1 Type movement analysis & market share, 2017 and 2025

The increasing preference for polyurethane foams in building & construction industry as an insulation material is expected to drive its demand over the forecast period.

The demand for polyurethane foam segment constituted for the second largest market share in 2017. The segment is estimated to continue its dominance over the forecast period owing to its steady demand in furniture & bedding, building & construction, rail, and marine industries. This is a result of its superior capabilities such as light weight, low heat and sound transfer, high energy dissipation and insulation

FIG. 14 Type outlook, 2017 & 2025 (USD Million)



Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In terms of revenue, the market share of polystyrene foam segment was estimated as the largest which accounted for 34.26% in 2017 and is expected to constitute 30.09% by 2025. It is followed by polyurethane segment which accounted for a market share of 24.32% in 2017. PVC foam segment is estimated to progress at a significant CAGR of 4.8% over the forecast period. Its market share was estimated at 8.78% in 2017.

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4.1.1 Polyurethane Foam

4.1.1.1 POLYMER FOAM MARKET ESTIMATES AND FORECASTS BY POLYURETHANE FOAM, 2014–2025 (KILOTONS) (USD MILLION)

Table 1 Polymer foam market estimates and forecasts by polyurethane foam, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	5,957.2	6,128.7	6,305.0	6,486.2	6,672.6	6,864.1	7,061.1	7,263.5	7,471.6	7,685.4	7,905.2	8,131.1	2.9%
Revenue (USD Million)	23,097.8	23,924.3	24,779.9	25,665.5	26,582.3	27,531.1	28,513.2	29,529.6	30,581.5	31,670.1	32,796.7	33,962.4	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyurethane foams primarily exist in two forms including flexible polyurethanes foams and rigid polyurethanes foams. Light weight, high resilience, and sound absorption properties of flexible polyurethane foams make them suitable for vibration and noise dampening, and cushion seat manufacturing applications in automotive, furniture & bedding industries. While the preference for rigid polyurethane foam as an insulating material in rail and marine applications is increasing.

4.1.1.2 Polymer foam market estimates and forecasts by polyurethane foam, by region, 2014–2025, (Kilotons) (USD Million)

Table 2 Polymer foam market volume by polyurethane foam, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,294.7	1,331.8	1,370.1	1,409.4	1,449.9	1,491.6	1,534.6	1,578.8	1,624.2	1,671.1	1,719.3	1,769.0	2.9%
Europe	1,448.0	1,486.6	1,526.2	1,566.9	1,608.6	1,651.4	1,695.3	1,740.3	1,786.5	1,833.9	1,882.6	1,932.5	2.7%
Asia Pacific	2,471.3	2,547.4	2,625.8	2,706.5	2,789.6	2,875.2	2,963.4	3,054.2	3,147.6	3,243.9	3,342.9	3,444.9	3.1%
Central & South America	248.5	255.0	261.7	268.6	275.6	282.9	290.4	298.0	305.9	314.0	322.3	330.8	2.6%
Middle East & Africa	494.6	507.8	521.2	534.9	548.8	563.0	577.5	592.2	607.3	622.5	638.1	653.9	2.5%
Total	5,957.2	6,128.7	6,305.0	6,486.2	6,672.6	6,864.1	7,061.1	7,263.5	7,471.6	7,685.4	7,905.2	8,131.1	2.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Superior insulating properties makes polymer foams ideal for roofs and walls in new houses. Polyurethane foams used in houses helps in maintaining uniform temperature and reducing noise levels. This property helps in lot of energy consumption and saves money in extreme temperature regions. When combined with proper additives, PU foams works as moisture and external weather barriers.

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Table 3 Polymer foam market revenue by polyurethane foam, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	4,887.3	5,057.7	5,234.0	5,416.5	5,605.3	5,800.7	6,002.9	6,212.1	6,428.6	6,652.5	6,884.3	7,124.1	3.5%
Europe	5,978.5	6,184.9	6,398.2	6,618.7	6,846.7	7,082.2	7,325.7	7,577.3	7,837.3	8,106.0	8,383.7	8,670.6	3.4%
Asia Pacific	9,599.6	9,970.6	10,355.7	10,755.4	11,170.3	11,600.9	12,047.8	12,511.5	12,992.8	13,492.3	14,010.5	14,548.3	3.8%
Central & South America	880.3	906.4	933.3	961.0	989.6	1,019.1	1,049.5	1,080.8	1,113.1	1,146.4	1,180.7	1,216.1	3.0%
Middle East & Africa	1,752.1	1,804.7	1,858.6	1,913.8	1,970.4	2,028.2	2,087.4	2,147.9	2,209.7	2,272.9	2,337.5	2,403.4	2.9%
Total	23,097.8	23,924.3	24,779.9	25,665.5	26,582.3	27,531.1	28,513.2	29,529.6	30,581.5	31,670.1	32,796.7	33,962.4	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyurethane foam in Asia Pacific region was valued at USD 10,755.4 million in 2017 and is projected to reach USD 14,548.3 million by 2025. Asia Pacific region accounted for more than 41% of the market share in 2017 and is expected to attain a market share of 42.84% by 2025 expanding at a CAGR of 3.8% between 2017 and 2025.

4.1.2 Polystyrene Foam

4.1.2.1 Polymer foam market estimates and forecasts by polystyrene foam, 2014–2025 (Kilotons) (USD Million)

Table 4 Polymer foam market estimates and forecasts by polystyrene foam, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	4,823.6	4,941.2	5,061.8	5,185.3	5,311.8	5,441.4	5,574.2	5,710.2	5,849.6	5,992.4	6,138.7	6,288.5	2.4%
Revenue (USD Million)	31,050.4	32,016.0	33,011.7	34,038.2	35,096.6	36,187.9	37,313.1	38,473.2	39,669.4	40,902.7	42,174.3	43,485.4	3.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polystyrene foam was estimated at 5,185.3 kilotons in 2017 and is projected to reach 6,288.5 kilotons by 2025 progressing at a CAGR of 2.4% over the forecast period. Expanded polystyrene foam has excellent shock absorbing properties and is preferred in storing and transporting of electrical equipment, cooked food, and perishable goods. The polystyrene foam is preferred in various marine floatation applications including construction of floating docks, surfboards, and boat stands. The growth in the shipbuilding in Europe and Asia Pacific region is expected to drive the demand for polystyrene foam over the forecast period.

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4.1.2.2 POLYMER FOAM MARKET ESTIMATES AND FORECASTS BY POLYSTYRENE FOAM, BY REGION, 2014–2025, (KILOTONS) (USD MILLION)

Table 5 Polymer foam market volume by polystyrene foam, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	927.4	949.2	971.5	994.4	1,017.8	1,041.7	1,066.1	1,091.1	1,116.7	1,142.8	1,169.6	1,196.9	2.3%
Europe	1,314.5	1,346.1	1,378.5	1,411.7	1,445.6	1,480.4	1,516.1	1,552.6	1,590.0	1,628.3	1,667.6	1,707.8	2.4%
Asia Pacific	1,997.9	2,050.7	2,105.0	2,160.8	2,218.2	2,277.1	2,337.6	2,399.7	2,463.6	2,529.3	2,596.7	2,666.0	2.7%
Central & South America	194.8	199.2	203.6	208.1	212.7	217.4	222.2	227.2	232.2	237.4	242.7	248.1	2.2%
Middle East & Africa	388.9	395.9	402.9	409.9	417.0	424.1	431.3	438.5	445.8	453.1	460.4	467.8	1.7%
Total	4,823.6	4,941.1	5,061.5	5,184.9	5,311.2	5,440.7	5,573.3	5,709.1	5,848.3	5,990.9	6,137.0	6,286.6	2.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polystyrene foam in Asia Pacific region was estimated as the largest, which accounted for 36.78% of the global demand in 2017. Expanding at a CAGR of 4.2% between 2017 and 2025, the demand for polystyrene foam in Asia Pacific region is expected to comprise for 37.97% of the market share in 2025. The ability of polystyrene foam to be produced in custom shapes make it a preferable material by various end users in Asia Pacific region.

Table 6 Polymer foam market revenue by polystyrene foam, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	5,787.1	5,971.5	6,161.7	6,357.9	6,560.2	6,768.8	6,984.0	7,205.9	7,434.8	7,670.8	7,914.2	8,165.2	3.2%
Europe	7,828.6	8,092.8	8,365.4	8,646.7	8,937.0	9,236.6	9,545.7	9,864.6	10,193.7	10,533.1	10,883.2	11,244.4	3.3%
Asia Pacific	12,823.7	13,253.5	13,697.8	14,157.1	14,632.0	15,122.9	15,630.4	16,155.1	16,697.6	17,258.4	17,838.3	18,437.8	3.4%
Central & South America	1,539.0	1,572.2	1,606.3	1,641.1	1,676.7	1,713.1	1,750.3	1,788.4	1,827.3	1,867.1	1,907.8	1,949.5	2.2%
Middle East & Africa	3,072.1	3,125.3	3,178.9	3,232.9	3,287.2	3,341.9	3,396.9	3,452.1	3,507.7	3,563.4	3,619.4	3,675.4	1.6%
Total	31,050.4	32,015.2	33,010.0	34,035.6	35,093.0	36,183.2	37,307.2	38,466.1	39,660.9	40,892.8	42,162.9	43,472.4	3.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polystyrene foam was valued at USD 34,035.6 million in 2017 and is projected to reach USD 43,472.4 million by 2025 advancing at a CAGR of 3.1% over the forecast period. Expanded polystyrene foam is one of the lightest materials and on account of its high strength to weight ratio, it is used in packaging applications as it results in low fuel consumption and transport cost savings.

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Polystyrene foam can also be used in rail applications such as construction of train station platform extensions, rail embankment and others. The rail infrastructure construction projects in Asia Pacific and Middle East & Africa regions is expected to drive the demand for polystyrene foam over the forecast period.

4.1.3 PVC Foam

4.1.3.1 Polymer foam market estimates and forecasts by PVC foam, 2014–2025 (Kilotons) (USD Million)

Table 7 Polymer foam market estimates and forecasts by PVC foam, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	3,259.8	3,380.4	3,505.5	3,635.2	3,769.9	3,909.5	4,054.4	4,204.8	4,360.8	4,522.7	4,690.6	4,864.9	3.7%
Revenue (USD Million)	8,056.1	8,438.8	8,840.7	9,262.7	9,706.0	10,171.8	10,661.2	11,175.4	11,716.0	12,284.2	12,881.6	13,509.8	4.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for PVC foam is predominantly driven by the wind energy capacity additions across the globe. The demand for PVC foam is expected to be highest in Asia Pacific region on account of the robust wind energy capacity additions in this region. In terms of volume, the demand for PVC foam was estimated at 3,635.2 kilotons in 2017 and is projected to reach 4,864.9 kilotons by 2025 expanding at a CAGR of 3.7% over the forecast period. In terms of value, the demand for PVC foam was valued at USD 9,262.7 million in 2017 and is projected to reach USD 13,509.8 million by 2025 expanding at a CAGR of 4.8% over the forecast period.

4.1.3.2 POLYMER FOAM MARKET ESTIMATES AND FORECASTS BY PVC FOAM, BY REGION, 2014–2025, (KILOTONS) (USD MILLION)

Table 8 Polymer foam market volume by PVC foam, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	818.4	846.3	875.3	905.2	936.1	968.0	1,001.0	1,035.2	1,070.5	1,107.0	1,144.7	1,183.6	3.4%
Europe	850.5	880.3	911.2	943.2	976.4	1,010.7	1,046.2	1,083.0	1,121.2	1,160.7	1,201.6	1,243.9	3.5%
Asia Pacific	1,224.4	1,276.8	1,331.5	1,388.5	1,448.0	1,510.1	1,574.8	1,642.3	1,712.8	1,786.2	1,862.9	1,942.8	4.3%
Central & South America	123.7	127.2	130.8	134.5	138.4	142.3	146.3	150.5	154.8	159.1	163.7	168.3	2.8%
Middle East & Africa	242.9	249.7	256.7	263.8	271.1	278.5	286.0	293.8	301.6	309.7	317.8	326.2	2.7%
Total	3,259.8	3,380.4	3,505.5	3,635.2	3,769.9	3,909.5	4,054.4	4,204.8	4,360.8	4,522.7	4,690.6	4,864.9	3.7%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for PVC foam in Asia Pacific region was estimated at 1,388.5 kilotons in 2017 and is projected to reach 1,942.8 by 2025 ascending at a CAGR of 4.3% between 2017 and 2025.. PVC foam boards can be fabricated as per the desired requirements and do not fade for long time. PVC foams are used in automotive ceiling applications, sports equipment, and electronic applications. The need for long lasting, light weight, strong, and cost competitive materials had led to the increased preference for PVC foam by automotive and wind turbine manufacturers in Asia Pacific region.

Table 9 Polymer foam market revenue by PVC foam, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,755.1	1,825.4	1,898.5	1,974.5	2,053.5	2,135.7	2,221.2	2,310.1	2,402.5	2,498.7	2,598.6	2,702.6	4.0%
Europe	2,095.5	2,195.0	2,299.3	2,408.6	2,523.2	2,643.4	2,769.4	2,901.5	3,040.1	3,185.4	3,337.8	3,497.7	4.8%
Asia Pacific	3,045.3	3,220.7	3,406.5	3,603.5	3,812.3	4,033.7	4,268.4	4,517.2	4,781.1	5,061.0	5,357.9	5,672.8	5.8%
Central & South America	391.5	404.2	417.4	431.0	445.1	459.6	474.6	490.0	506.0	522.5	539.5	557.1	3.3%
Middle East & Africa	768.7	793.5	819.0	845.1	871.9	899.4	927.7	956.6	986.2	1,016.6	1,047.7	1,079.6	3.1%
Total	8,056.1	8,438.8	8,840.7	9,262.7	9,706.0	10,171.8	10,661.2	11,175.4	11,716.0	12,284.2	12,881.6	13,509.8	4.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for PVC foam in Europe was valued at USD 2,408.6 million in 2017 and is projected to reach USD 3,497.7 million by 2025 ascending at a CAGR of 4.8%. The demand for PVC foam in Asia Pacific region accounted for 38.90% of the total market share in 2017 and is projected to attain a market share of 41.99% by 2025, the highest among other regions.

4.1.4 Phenolic foam

4.1.4.1 Polymer foam market estimates and forecasts by phenolic foam, 2014–2025 (Kilotons) (USD Million)

Table 10 Polymer foam market estimates and forecasts by phenolic foam, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	2,049.9	2,129.9	2,213.2	2,299.9	2,390.3	2,484.4	2,582.4	2,684.5	2,790.8	2,901.6	3,017.1	3,138.5	4.0%
Revenue (USD Million)	8,414.8	8,844.4	9,297.5	9,775.4	10,279.6	10,811.6	11,373.1	11,965.8	12,591.5	13,252.3	13,950.2	14,692.6	5.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Phenolic foams are yet to realize its true potential owing to the dominance of the other foams such as polyurethane, polystyrene and polyvinyl. It is increasingly being used in the tanks, vessels, and pipework for the purpose of insulation. It is also used in many building application such as external wall board, cavity board, wall insulation, roofing and fire resistant panels. Its fire resistant properties are expected to increase its market share over the forecast period. It is also being used in insulations in submarines and off-shore installations.

4.1.4.2 Polymer foam market estimates and forecasts by phenolic foam, by region, 2014–2025, (Kilotons) (USD Million)

Table 11 Polymer foam market volume by phenolic foam, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	434.0	445.1	456.5	468.3	480.3	492.6	505.2	518.1	531.4	545.0	559.0	574.4	2.6%
Europe	615.4	639.2	663.9	689.7	716.4	744.2	773.1	803.2	834.4	866.9	900.7	935.8	3.9%
Asia Pacific	791.6	830.1	870.5	912.9	957.4	1,004.0	1,053.0	1,104.4	1,158.4	1,215.0	1,274.4	1,336.8	4.9%
Central & South America	78.1	80.5	83.1	85.7	88.5	91.3	94.2	97.2	100.2	103.4	106.7	110.1	3.2%
Middle East & Africa	130.9	135.0	139.2	143.4	147.8	152.3	156.9	161.6	166.4	171.3	176.3	181.5	3.0%
Total	2,049.9	2,129.9	2,213.2	2,299.9	2,390.3	2,484.4	2,582.4	2,684.5	2,790.8	2,901.6	3,017.1	3,138.5	4.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to European Phenolic Foam Association, phenolic foam has very low embodied energy which results in reducing the carbon emissions from the building. In addition, phenolic foams comply with various European fire certifications such as Belgium A1, Scandinavian NT 036 Class 1, Dutch NEN 6065/6066 Class 1, and German B1 certifications. As a result, phenolic foam is expected to witness rise in demand over the forecast period.

Table 12 Polymer foam market revenue by phenolic foam, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,744.9	1,809.0	1,875.4	1,944.3	2,015.8	2,089.9	2,166.8	2,246.6	2,329.4	2,415.3	2,504.4	2,602.0	3.7%
Europe	2,628.1	2,760.6	2,900.1	3,047.0	3,201.7	3,364.8	3,536.6	3,717.6	3,908.3	4,109.4	4,321.3	4,544.7	5.1%
Asia Pacific	3,079.0	3,266.0	3,464.9	3,676.6	3,901.9	4,141.7	4,396.9	4,668.7	4,958.2	5,266.5	5,594.9	5,944.9	6.2%
Central & South America	359.6	377.0	395.3	414.4	434.4	455.4	477.4	500.5	524.7	550.0	576.6	604.4	4.8%
Middle East & Africa	603.2	631.9	661.9	693.2	725.8	759.8	795.4	832.4	871.0	911.1	953.0	996.6	4.6%
Total	8,414.8	8,844.4	9,297.5	9,775.4	10,279.6	10,811.6	11,373.1	11,965.8	12,591.5	13,252.3	13,950.2	14,692.6	5.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for phenolic foam in Europe was valued at USD 3,047.0 million in 2017 and is projected to reach USD 4,544.7 million by 2025 ascending at a CAGR of 5.1% over the forecast period.

4.1.5 Polyolefin foam

4.1.5.1 Polymer foam market estimates and forecasts by polyolefin foam, 2014–2025 (Kilotons) (USD Million)

Table 13 Polymer foam market estimates and forecasts by polyolefin foam, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	2,642.9	2,758.6	2,879.4	3,005.6	3,137.3	3,274.9	3,418.5	3,568.6	3,725.3	3,888.9	4,059.8	4,238.3	4.4%
Revenue (USD Million)	12,080.2	12,711.2	13,376.6	14,078.1	14,818.1	15,598.6	16,422.0	17,290.8	18,207.8	19,175.6	20,197.3	21,276.1	5.3%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyolefin forms have increased their penetration over the past few years in flooring and automotive industries. Companies such as Sekisui Alveo AG, Armacell International S.A., Borealis AG, produces polyolefin foams in rolls and sheets and these foams are environmentally friendly, versatile and lightweight. They are extensively used for insulation in construction and industrial applications. They are also expected to increase their penetration in the automotive sector owing to their ability to impart good weathering resistance, lightweight and excellent mechanical properties.

4.1.5.2 Polymer foam market estimates and forecasts by polyolefin foam, by region, 2014–2025, (Kilotons) (USD Million)

Table 14 Polymer foam market volume by polyolefin foam, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	490.1	511.2	533.2	556.3	580.3	605.5	631.8	659.2	688.0	718.0	749.4	782.3	4.4%
Europe	752.3	786.5	822.2	859.6	898.8	939.8	982.7	1,027.6	1,074.6	1,123.9	1,175.4	1,229.4	4.6%
Asia Pacific	1,063.7	1,111.1	1,160.7	1,212.5	1,266.6	1,323.1	1,382.2	1,443.8	1,508.3	1,575.5	1,645.8	1,719.2	4.5%
Central & South America	117.4	122.0	126.8	131.7	136.9	142.3	147.9	153.7	159.7	166.0	172.5	179.3	3.9%
Middle East & Africa	219.5	227.8	236.5	245.4	254.7	264.2	274.0	284.2	294.7	305.5	316.6	328.1	3.7%
Total	2,642.9	2,758.6	2,879.4	3,005.6	3,137.3	3,274.9	3,418.5	3,568.6	3,725.3	3,888.9	4,059.8	4,238.3	4.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyolefin foams, in particular polyethylene and polypropylene foams, are used largely due to the increasing demand for packaging materials in e-commerce industry. Zotefoams, plc is developing recyclable polyethylene foams to reduce the packaging waste during transit.

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Table 15 Polymer foam market revenue by polyolefin foam, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,801.1	1,885.0	1,973.0	2,065.2	2,162.0	2,263.5	2,369.9	2,481.6	2,598.8	2,721.8	2,850.9	2,986.5	4.7%
Europe	3,057.0	3,242.5	3,439.7	3,649.3	3,872.1	4,108.9	4,360.8	4,628.7	4,913.7	5,216.9	5,539.5	5,882.8	6.2%
Asia Pacific	4,294.5	4,536.9	4,793.3	5,064.7	5,351.8	5,655.8	5,977.6	6,318.2	6,678.9	7,060.8	7,465.2	7,893.6	5.7%
Central & South America	1,020.1	1,062.4	1,106.4	1,152.3	1,200.1	1,249.8	1,301.6	1,355.5	1,411.7	1,470.2	1,531.1	1,594.5	4.1%
Middle East & Africa	1,907.5	1,984.4	2,064.1	2,146.6	2,232.1	2,320.6	2,412.1	2,506.8	2,604.7	2,706.0	2,810.6	2,918.7	3.9%
Total	12,080.2	12,711.2	13,376.6	14,078.1	14,818.1	15,598.6	16,422.0	17,290.8	18,207.8	19,175.6	20,197.3	21,276.1	5.3%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyolefin foam in Asia Pacific region was valued at USD 5,064.7 million in 2017 and is projected to reach USD 7,893.6 million by 2025 ascending at a CAGR of 5.7% over the forecast period.

4.1.6 Melamine foam

4.1.6.1 Polymer foam market estimates and forecasts by melamine foam, 2014–2025 (Kilotons) (USD Million)

Table 16 Polymer foam market estimates and forecasts by melamine foam, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,570.3	1,633.5	1,699.6	1,768.7	1,841.0	1,916.7	1,995.9	2,078.8	2,165.6	2,256.5	2,351.6	2,451.3	4.2%
Revenue (USD Million)	6,054.9	6,388.1	6,740.6	7,113.4	7,507.8	7,925.1	8,366.6	8,833.9	9,328.5	9,852.0	10,406.1	10,992.8	5.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Melamine foams possess flame retarding properties, hot flexibility, high sound absorption and thermal insulation which has helped it in establishing itself in the marine, automotive & transportation, electronic military and aviation sectors. Although it does not have a very high penetration level as compared to other polymer foams in these applications, but it is expected to improve its market share over the forecast period. Asia Pacific and North America will remain strong markets for these foams over the next few years.

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4.1.6.2 Polymer foam market estimates and forecasts by melamine foam, by region, 2014–2025, (Kilotons) (USD Million)

Table 17 Polymer foam market volume by melamine foam, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	389.7	400.4	411.4	422.8	434.6	446.7	459.1	472.0	485.3	499.1	513.2	527.9	2.8%
Europe	483.8	504.3	525.8	548.2	571.5	595.9	621.3	647.8	675.4	704.3	734.3	765.7	4.3%
Asia Pacific	526.4	555.0	585.3	617.2	651.0	686.7	724.4	764.3	806.4	851.0	898.1	947.9	5.5%
Central & South America	58.9	60.3	61.7	63.2	64.7	66.2	67.8	69.4	71.1	72.9	74.6	76.5	2.4%
Middle East & Africa	111.5	113.4	115.4	117.3	119.3	121.3	123.3	125.3	127.3	129.3	131.3	133.3	1.6%
Total	1,570.3	1,633.5	1,699.6	1,768.7	1,841.0	1,916.7	1,995.9	2,078.8	2,165.6	2,256.5	2,351.6	2,451.3	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Conventional polyurethane foams might emit toxic by-products upon exposure to extreme temperatures. Melamine foams, which are halide free, do not emit toxic by-products upon exposure to heat and exhibit high thermal stability and thermal resistance. As a result, melamine foams are expected to witness high demand in marine, building & construction applications.

Table 18 Polymer foam market revenue by melamine foam, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,250.6	1,303.6	1,359.1	1,417.2	1,478.0	1,541.5	1,608.1	1,677.7	1,750.6	1,826.9	1,906.8	1,990.5	4.3%
Europe	1,881.0	1,988.4	2,102.1	2,222.2	2,349.1	2,483.4	2,625.2	2,775.2	2,933.8	3,101.3	3,278.5	3,465.7	5.7%
Asia Pacific	2,141.1	2,283.2	2,434.8	2,596.6	2,769.2	2,953.4	3,149.9	3,359.6	3,583.4	3,822.2	4,077.0	4,348.9	6.7%
Central & South America	270.4	282.1	294.3	307.0	320.4	334.4	349.0	364.3	380.3	397.0	414.6	432.9	4.4%
Middle East & Africa	511.9	530.8	550.3	570.3	591.0	612.4	634.4	657.1	680.4	704.5	729.3	754.8	3.6%
Total	6,054.9	6,388.1	6,740.6	7,113.4	7,507.8	7,925.1	8,366.6	8,833.9	9,328.5	9,852.0	10,406.1	10,992.8	5.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for melamine foam in North America was valued at USD 1,417.2 million in 2017 and is projected to reach USD 1,990.5 million by 2025 ascending at a CAGR of 4.3% over the forecast period.

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4.1.7 Others

4.1.7.1 Polymer foam market estimates and forecasts by other foams, 2014–2025 (Kilotons) (USD Million)

Table 19 Polymer foam market estimates and forecasts by other foams, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,079.4	1,111.6	1,143.2	1,174.1	1,204.2	1,233.2	1,261.1	1,287.6	1,312.6	1,335.8	1,356.9	1,374.7	2.0%
Revenue (USD Million)	5,129.6	5,284.6	5,436.8	5,585.7	5,730.6	5,870.8	6,005.3	6,133.4	6,254.1	6,366.2	6,468.7	6,555.5	2.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The other polymer foams witnessing significant growth in building & construction, packaging, and automotive applications are PVDF (Polyvinylidene difluoride), polyethylene terephthalate (PET) foams, and silicone foams. Silicone foams are usually used in high performance applications i.e. where functioning is of utmost importance. Applications electronic and communication components, machinery, transportation equipment and appliances are key segments for propelling demand of silicone foams. PET foams and silicone foams are expected to witness significant growth in wind and rail applications respectively.

4.1.7.2 Polymer foam market estimates and forecasts by other foams, by region, 2014–2025, (Kilotons) (USD Million)

Table 20 Polymer foam market volume by other foams, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	367.2	376.7	386.2	395.8	405.3	414.8	424.3	433.6	442.9	452.0	460.9	468.5	2.1%
Europe	317.4	326.5	335.5	344.2	352.6	360.8	368.6	376.0	383.0	389.5	395.4	400.6	1.9%
Asia Pacific	272.8	283.5	293.8	303.7	313.2	322.0	330.1	337.5	344.0	349.5	353.8	356.8	2.0%
Central & South America	48.9	50.1	51.3	52.4	53.5	54.6	55.7	56.8	57.8	58.8	59.7	60.6	1.8%
Middle East & Africa	73.1	74.8	76.4	78.0	79.5	81.0	82.4	83.7	84.9	86.1	87.1	88.0	1.5%
Total	1,079.4	1,111.6	1,143.2	1,174.1	1,204.2	1,233.2	1,261.1	1,287.6	1,312.6	1,335.8	1,356.9	1,374.7	2.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for other foams in Asia Pacific region was estimated at 303.7 kilotons in 2017 and is projected to reach 356.8 kilotons by 2025 expanding at a CAGR of 2.0%. Silicone foams are expected to witness significant growth in the European countries on account of its vibration and sound dampening properties in high speed rail applications.

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Various European countries invested in high speed rail projects which is expected to drive the demand for silicone foams over the forecast period. The demand for other foams in European region was estimated at 318.1 kilotons, which accounted for 24.73% of the market share in 2017.

Table 21 Polymer foam market revenue by other foams, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,472.4	1,520.5	1,569.3	1,618.7	1,668.5	1,718.9	1,769.6	1,820.5	1,871.5	1,922.6	1,973.5	2,019.3	2.8%
Europe	1,592.5	1,637.8	1,682.3	1,725.7	1,767.8	1,808.3	1,847.0	1,883.6	1,917.7	1,949.0	1,977.1	2,001.5	1.9%
Asia Pacific	1,396.0	1,443.9	1,489.7	1,533.2	1,573.9	1,611.5	1,645.6	1,675.8	1,701.5	1,722.3	1,737.6	1,746.9	1.6%
Central & South America	268.1	273.7	279.2	284.6	289.8	294.9	299.8	304.6	309.1	313.4	317.5	321.4	1.5%
Middle East & Africa	400.6	408.6	416.3	423.6	430.6	437.2	443.3	449.0	454.2	458.9	463.0	466.5	1.2%
Total	5,129.6	5,284.6	5,436.8	5,585.7	5,730.6	5,870.8	6,005.3	6,133.4	6,254.1	6,366.2	6,468.7	6,555.5	2.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

PET foam, owing to its maximum service life, light weight, and high mechanical strength, is witnessing an increasing demand in composite structures. On account of the increasing use of composite structures in wind turbine blade manufacturing, the demand for PET foam is expected to increase over the forecast period.

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CHAPTER 05

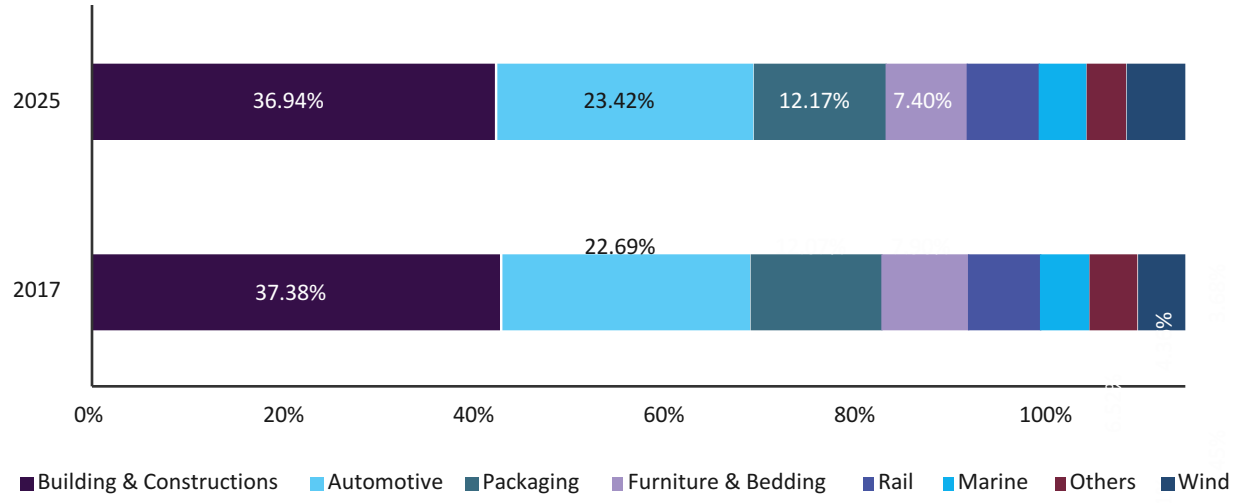
Polymer Foam Market: Application Estimates & Trend Analysis

5.1 Application movement analysis & market share, 2017 and 2025

The robust growth in the building & construction, and automotive industries and ambitious wind energy capacity addition targets set by China, India, Germany, and UK is expected to drive the demand for polymer foam in wind application segment.

The demand for polymer foam in building & construction application segment was estimated as the largest owing to the robust infrastructure investments in the Asia Pacific and Middle East countries such as China, India, Saudi Arabia, and UAE. In terms of revenue, the market share of building & construction application segment was 36.94% in 2017 and expanding at a CAGR of 3.9%, its market share is expected to account for 42.73% in 2025.

FIG. 15 Application outlook, 2017 & 2025 (% revenue)



Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Building & construction application segmentation was followed by automotive application segment, which was estimated to grow at the highest CAGR of 4.4% between 2017 and 2025. It held a market share of 22.69% in 2017 and is anticipated to constitute a market share of 23.42% by 2025.

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5.1.1 Packaging

5.1.1.1 Polymer foam market estimates and forecasts in packaging, 2014–2025 (Kilotons) (USD Million)

Table 22 Polymer foam market estimates and forecasts in packaging, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	2,578.5	2,657.5	2,738.9	2,822.8	2,909.4	2,998.6	3,090.6	3,185.5	3,283.3	3,384.1	3,488.1	3,595.3	3.1%
Revenue (USD Million)	11,296.0	11,754.6	12,232.8	12,731.5	13,251.7	13,794.4	14,360.7	14,951.7	15,568.7	16,212.8	16,885.4	17,588.0	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam, in particular polystyrene foam and polyethylene foam, is increasing in packaging applications. Reduction of packaging waste and costs is a priority for the packaging companies and as a result, the demand for light weight polymer foam packaging materials is steadily growing. The demand for recycled polyethylene foam as an alternative to expanded polystyrene foam in consumer packaging applications is increasing in the Europe and North America regions.

5.1.1.2 Polymer foam market estimates and forecasts in packaging, by region, 2014–2025 (Kilotons) (USD Million)

Table 23 Polymer foam market volume in packaging, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	608.7	626.4	644.6	663.4	682.7	702.7	723.3	744.5	766.4	788.9	812.2	836.2	2.9%
Europe	787.4	814.0	841.6	870.1	899.5	930.0	961.6	994.3	1,028.1	1,063.0	1,099.2	1,136.7	3.4%
Asia Pacific	900.7	929.8	959.7	990.5	1,022.4	1,055.1	1,089.0	1,123.8	1,159.7	1,196.8	1,234.9	1,274.3	3.2%
Central & South America	88.6	90.5	92.4	94.3	96.3	98.3	100.4	102.5	104.6	106.8	109.1	111.4	2.1%
Middle East & Africa	193.1	196.9	200.7	204.6	208.5	212.4	216.4	220.4	224.5	228.6	232.7	236.8	1.8%
Total	2,578.5	2,657.5	2,738.9	2,822.8	2,909.4	2,998.6	3,090.6	3,185.5	3,283.3	3,384.1	3,488.1	3,595.3	3.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in packaging applications was dominated by the Asia Pacific region. The demand was estimated at 990.5 kilotons in 2017 and is projected to reach 1,274.3 kilotons by 2025 progressing at a CAGR of 3.2% over the forecast period.

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Table 24 Polymer foam market revenue in packaging, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	2,457.7	2,546.4	2,638.5	2,733.8	2,832.6	2,934.9	3,041.0	3,150.9	3,264.7	3,382.7	3,505.0	3,631.8	3.6%
Europe	3,376.0	3,528.9	3,689.1	3,856.7	4,032.2	4,216.1	4,408.7	4,610.4	4,821.9	5,043.4	5,275.7	5,519.3	4.6%
Asia Pacific	3,975.5	4,152.9	4,338.5	4,532.7	4,735.9	4,948.7	5,171.6	5,405.0	5,649.5	5,905.6	6,174.1	6,455.6	4.5%
Central & South America	512.2	526.6	541.4	556.8	572.7	589.1	606.1	623.7	641.8	660.6	680.1	700.3	2.9%
Middle East & Africa	974.6	999.7	1,025.4	1,051.5	1,078.3	1,105.6	1,133.4	1,161.8	1,190.8	1,220.3	1,250.5	1,281.1	2.5%
Total	11,296.0	11,754.6	12,232.8	12,731.5	13,251.7	13,794.4	14,360.7	14,951.7	15,568.7	16,212.8	16,885.4	17,588.0	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for more personalized products and the rapid digitalization had triggered huge growth for customized packaging materials from the packaging industry in Asia Pacific region. This in turn is expected to result in high demand for various polymer foams that can be fabricated as per the desired applications.

5.1.2 Building & constructions

5.1.2.1 Polymer foam market estimates and forecasts in building & constructions, 2014–2025 (Kilotons) (USD Million)

Table 25 Polymer foam market estimates and forecasts in building & constructions, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	8,170.6	8,428.8	8,695.3	8,970.4	9,254.4	9,547.6	9,850.2	10,162.5	10,485.0	10,817.9	11,161.5	11,516.3	3.2%
Revenue (USD Million)	35,247.5	36,590.7	37,987.1	39,439.0	40,948.7	42,518.9	44,152.3	45,851.5	47,619.7	49,459.9	51,375.4	53,369.7	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in building & constructions applications was estimated at 8,970.4 kilotons in 2017 and is projected to reach 11,516.3 kilotons by 2025 expanding at a CAGR of 3.2% over the forecast period. Building and construction is expected to be the most important industry for polymer foam market products owing to its various characteristics including excellent sound and thermal insulation, strength to weight ratio, load bearing capacity and chemical resistance. These characteristics have led to have a high usage in building and construction applications. As various governments and multinational players in the Asia Pacific region are spending heavily on infrastructure activities, polymer foam demand is expected to increase over the forecast period.

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5.1.2.2 Polymer foam market estimates and forecasts in building & constructions, by region, 2014–2025 (Kilotons) (USD Million)

Table 26 Polymer foam market volume in building & constructions, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,830.2	1,876.7	1,924.3	1,973.3	2,023.5	2,075.0	2,127.9	2,182.2	2,237.9	2,295.0	2,353.7	2,413.9	2.6%
Europe	1,974.4	2,036.2	2,100.0	2,165.8	2,233.7	2,303.7	2,375.9	2,450.5	2,527.4	2,606.8	2,688.7	2,773.2	3.1%
Asia Pacific	3,309.5	3,430.1	3,555.1	3,684.7	3,819.1	3,958.4	4,102.8	4,252.6	4,408.0	4,569.1	4,736.1	4,909.4	3.7%
Central & South America	305.9	315.0	324.3	334.0	343.9	354.1	364.7	375.5	386.7	398.2	410.1	422.3	3.0%
Middle East & Africa	750.5	770.8	791.6	812.7	834.3	856.4	878.8	901.7	925.0	948.7	972.9	997.5	2.6%
Total	8,170.6	8,428.8	8,695.3	8,970.4	9,254.4	9,547.6	9,850.2	10,162.5	10,485.0	10,817.9	11,161.5	11,516.3	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The presence of energy EU's efficiency initiatives, such as Horizon 2020, to achieve energy efficiency in residential & commercial buildings is the main driver that is triggering the demand for polymer foam in building & construction industry in Europe.

Table 27 Polymer foam market revenue in building & constructions, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	6,970.8	7,188.4	7,412.6	7,643.8	7,882.1	8,127.7	8,380.9	8,641.9	8,910.9	9,188.1	9,473.9	9,768.6	3.1%
Europe	8,402.5	8,736.1	9,083.2	9,444.3	9,820.1	10,211.1	10,618.1	11,041.8	11,482.8	11,942.1	12,420.2	12,918.2	4.0%
Asia Pacific	13,975.8	14,583.3	15,218.3	15,882.3	16,576.7	17,303.1	18,063.1	18,858.4	19,691.0	20,562.6	21,475.5	22,431.7	4.4%
Central & South America	1,731.1	1,788.8	1,848.4	1,910.2	1,974.1	2,040.3	2,108.8	2,179.7	2,253.2	2,329.3	2,408.1	2,489.7	3.4%
Middle East & Africa	4,167.2	4,294.2	4,424.6	4,558.4	4,695.8	4,836.8	4,981.4	5,129.7	5,281.9	5,437.8	5,597.7	5,761.5	3.0%
Total	35,247.5	36,590.7	37,987.1	39,439.0	40,948.7	42,518.9	44,152.3	45,851.5	47,619.7	49,459.9	51,375.4	53,369.7	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Building & construction sector consumes the highest energy, yet their performance is below the standards. EU's low-carbon economy roadmap "EU Roadmap for Moving to a Competitive Low Carbon Economy in 2050" encourage the retrofit of existing buildings and construction of net-zero energy buildings. The penetration of net-zero energy buildings in Europe building & construction sector is expected to drive the demand for polyurethane foam.

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5.1.3 Furniture & Bedding

5.1.3.1 Polymer foam market estimates and forecasts in furniture & bedding, 2014–2025 (Kilotons) (USD Million)

Table 28 Polymer foam market estimates and forecasts in furniture & bedding, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,751.4	1,793.9	1,837.5	1,882.1	1,927.7	1,974.5	2,022.4	2,071.4	2,121.6	2,173.0	2,225.6	2,279.5	2.4%
Revenue (USD Million)	7,607.6	7,844.2	8,088.5	8,341.0	8,601.9	8,871.5	9,150.2	9,438.3	9,736.3	10,044.4	10,363.2	10,693.0	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in furniture & bedding applications was estimated at 1,882.1 kilotons in 2017 and is projected to 2,279.5 kilotons by 2025 expanding at a CAGR of 2.4% over the forecast period.

5.1.3.2 Polymer foam market estimates and forecasts in building & constructions, by region, 2014–2025 (Kilotons) (USD Million)

Table 29 Polymer foam market volume in furniture & bedding, by region, 2014– 2025 (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	344.8	352.8	360.9	369.3	377.8	386.5	395.4	404.6	413.9	423.4	433.2	443.2	2.2%
Europe	497.8	508.9	520.2	531.8	543.7	555.8	568.2	580.9	593.8	607.0	620.6	634.4	2.8%
Asia Pacific	685.4	704.4	723.9	744.0	764.6	785.8	807.6	830.0	853.0	876.6	900.9	925.9	1.5%
Central & South America	69.2	70.2	71.3	72.3	73.4	74.5	75.6	76.7	77.9	79.1	80.2	81.4	2.1%
Middle East & Africa	154.2	157.6	161.1	164.6	168.2	171.8	175.5	179.2	183.0	186.8	190.7	194.6	2.4%
Total	1,751.4	1,793.9	1,837.5	1,882.1	1,927.7	1,974.5	2,022.4	2,071.4	2,121.6	2,173.0	2,225.6	2,279.5	2.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in furniture & bedding application segment was dominated by the Asia Pacific region, which held a market share of 39.53% in 2017. Polymer foams are widely used in furniture and bedding applications such as cushioning, carpet upholstery and mattresses. It is primarily used owing to its low density and adequate support and fatigue resistance. Majority of the near term demand for polymer foam based products is from the furniture and bedding. There is a huge hype surrounding polymer foam in this sector.

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Table 30 Polymer foam market revenue in furniture & bedding, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,385.6	1,421.3	1,457.9	1,495.5	1,534.0	1,573.5	1,614.0	1,655.5	1,698.1	1,741.7	1,786.4	1,832.3	2.6%
Europe	2,065.1	2,137.0	2,211.4	2,288.4	2,368.1	2,450.8	2,536.4	2,625.0	2,716.9	2,812.1	2,910.7	3,013.0	3.5%
Asia Pacific	2,931.4	3,033.8	3,140.1	3,250.4	3,365.0	3,483.9	3,607.3	3,735.6	3,868.9	4,007.5	4,151.5	4,301.3	3.6%
Central & South America	422.2	431.8	441.6	451.7	462.0	472.6	483.4	494.5	505.9	517.6	529.6	541.9	2.3%
Middle East & Africa	803.3	820.3	837.5	855.0	872.8	890.8	909.1	927.6	946.5	965.6	984.9	1,004.5	2.0%
Total	7,607.6	7,844.2	8,088.5	8,341.0	8,601.9	8,871.5	9,150.2	9,438.3	9,736.3	10,044.4	10,363.2	10,693.0	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Growing furniture and bedding sector in emerging economies such as India and China has resulted in boosting production volumes of various polymer foam based components. Rising disposable income and improving living conditions is one of the crucial factors to drive the market over the forecast period.

5.1.4 Automotive

5.1.4.1 Polymer foam market estimates and forecasts in automotive, 2014–2025 (Kilotons) (USD Million)

Table 31 Polymer foam market estimates and forecasts in automotive, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	4,674.5	4,842.4	5,016.4	5,196.6	5,383.4	5,577.0	5,777.6	5,985.4	6,200.8	6,424.0	6,655.2	6,894.9	3.6%
Revenue (USD Million)	21,064.3	21,981.2	22,939.8	23,942.2	24,990.6	26,087.2	27,234.5	28,435.2	29,691.8	31,007.4	32,385.0	33,827.8	4.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

North America is expected to be a key region for polymer foam development in the automotive industry on account of positive outlook for the manufacturing sector in the U.S. Automotive segment was one of the fastest growing application segment in 2017, on account of increasing penetration of polymer foam based components for automotive parts and interiors of the vehicles. Its excellent mechanical strength properties, weight reduction abilities, wear and weathering resistance have made it one of the most important materials in automobile production. Automotive industry is expected to be an essential factor for growth of polymer foam market.

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5.1.4.2 Polymer foam market estimates and forecasts in automotive, by region, 2014–2025, (Kilotons) (USD Million)

Table 32 Polymer foam market volume in automotive, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,119.6	1,157.2	1,196.0	1,236.1	1,277.6	1,320.4	1,364.7	1,410.5	1,457.8	1,506.7	1,557.3	1,609.5	3.4%
Europe	1,357.0	1,403.9	1,452.3	1,502.4	1,554.3	1,607.9	1,663.4	1,720.8	1,780.2	1,841.7	1,905.2	1,970.9	3.5%
Asia Pacific	1,828.1	1,899.6	1,973.9	2,051.1	2,131.4	2,214.9	2,301.6	2,391.9	2,485.7	2,583.2	2,684.6	2,790.1	3.9%
Central & South America	194.6	201.0	207.6	214.4	221.4	228.7	236.2	244.0	252.1	260.4	269.0	277.9	3.3%
Middle East & Africa	175.1	180.8	186.6	192.6	198.8	205.1	211.6	218.2	225.0	232.0	239.1	246.4	3.1%
Total	4,674.5	4,842.4	5,016.4	5,196.6	5,383.4	5,577.0	5,777.6	5,985.4	6,200.8	6,424.0	6,655.2	6,894.9	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Automobile industry is expected to be fueled by the rise in spending capacity across the globe. In addition to this, regulatory authorities have laid down obligatory norms to increase the fuel efficiency of vehicles, which has compelled companies to invest in the research & development to achieve higher engine efficiency and make innovative changes in the vehicle design. On account of these norms, the emerging Asian economies including India, Singapore, and Thailand are rapidly becoming manufacturing hubs for electric vehicles for European companies. The rapid growth in the manufacturing of electric vehicles in the Asia Pacific region is expected to accelerate the use of polymer foam.

Table 33 Polymer foam market revenue in automotive, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	4,728.8	4,917.6	5,113.8	5,317.8	5,529.8	5,750.3	5,979.4	6,217.6	6,465.3	6,722.7	6,990.3	7,268.5	4.0%
Europe	5,863.4	6,116.5	6,380.8	6,657.0	6,945.4	7,246.8	7,561.7	7,890.8	8,234.9	8,594.5	8,970.5	9,363.7	4.4%
Asia Pacific	8,413.1	8,821.7	9,251.1	9,702.5	10,177.2	10,676.5	11,201.9	11,754.7	12,336.7	12,949.5	13,595.0	14,275.0	4.9%
Central & South America	1,075.4	1,114.2	1,154.6	1,196.5	1,240.0	1,285.2	1,332.1	1,380.8	1,431.4	1,483.9	1,538.4	1,595.1	3.7%
Middle East & Africa	983.7	1,011.3	1,039.5	1,068.5	1,098.1	1,128.4	1,159.4	1,191.2	1,223.6	1,256.8	1,290.7	1,325.4	2.7%
Total	21,064.3	21,981.2	22,939.8	23,942.2	24,990.6	26,087.2	27,234.5	28,435.2	29,691.8	31,007.4	32,385.0	33,827.8	4.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Europe is one of the premium car manufacturing hubs owing to its advanced infrastructure & technology, R&D initiatives and facilities, highly skilled workforce, and automotive heritage. The manufacturers in the European Union are focusing on the manufacturing of sustainable lightweight vehicles in a bid to reduce GHG emissions.

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5.1.5 Rail

5.1.5.1 Polymer foam market estimates and forecasts in rail, 2014–2025 (Kilotons) (USD Million)

Table 34 Polymer foam market estimates and forecasts in rail, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,453.5	1,507.9	1,564.5	1,623.4	1,684.6	1,748.3	1,814.6	1,883.5	1,955.3	2,029.9	2,107.6	2,188.4	3.8%
Revenue (USD Million)	6,126.3	6,367.2	6,618.3	6,880.1	7,153.0	7,437.6	7,734.5	8,044.3	8,367.5	8,705.0	9,057.3	9,425.2	4.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in rail applications was estimated at 1,684.6 kilotons in 2017 and is projected to reach 2,188.4 kilotons by 2025 expanding at a CAGR of 3.8% over the forecast period. In rail applications, polyurethane foams are used for sound proofing, vibration damping in rail and in manufacturing of cushion seat, high speed rail nose, door fillings, thermal insulation of heat ducts in high speed trains, rail window frames, luggage racks, rolling stock equipment and others. The increase in the investments in the rail infrastructure and high speed rail projects in the Asia Pacific countries such as China, India, and Japan is expected to drive the demand for polymer foam in the coming years.

5.1.5.2 Polymer foam market estimates and forecasts in rail, by region, 2014–2025, (Kilotons) (USD Million)

Table 35 Polymer foam market volume in rail, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	322.2	330.0	338.0	346.2	354.7	363.3	372.1	381.1	390.3	399.8	409.4	419.4	2.4%
Europe	370.4	384.6	399.4	414.8	430.8	447.4	464.7	482.7	501.4	520.9	541.2	562.3	3.9%
Asia Pacific	596.1	623.0	651.2	680.7	711.5	743.8	777.6	813.1	850.1	888.9	929.6	972.1	4.6%
Central & South America	51.6	53.5	55.6	57.6	59.8	62.0	64.4	66.8	69.3	71.9	74.6	77.4	3.8%
Middle East & Africa	113.1	116.7	120.3	124.0	127.9	131.8	135.8	139.9	144.1	148.4	152.8	157.3	3.0%
Total	1,453.5	1,507.9	1,564.5	1,623.4	1,684.6	1,748.3	1,814.6	1,883.5	1,955.3	2,029.9	2,107.6	2,188.4	3.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to European Commission, the length of high speed network in European Union increased from approximately 7,200 kilometers in 2014 to 9,067 kilometers in 2017. The increase in the length of high speed network was dominated by the Germany, Spain, Italy, and France. The high speed rail network is expanding with 1,671 kilometers of network under construction as of 2017. This increase in the high speed rail network is expected to drive the demand for polymer foam over the forecast period.

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Table 36 Polymer foam market revenue in rail, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	1,105.1	1,151.4	1,199.7	1,250.1	1,302.5	1,357.1	1,413.9	1,473.1	1,534.8	1,599.1	1,666.0	1,735.7	4.2%
Europe	1,704.1	1,779.4	1,858.4	1,941.1	2,027.8	2,118.7	2,214.1	2,314.1	2,419.1	2,529.3	2,644.9	2,766.5	4.5%
Asia Pacific	2,423.0	2,521.4	2,624.0	2,731.0	2,842.5	2,959.0	3,080.5	3,207.3	3,339.7	3,477.9	3,622.4	3,773.3	4.1%
Central & South America	313.5	321.1	329.0	337.0	345.3	353.9	362.7	371.7	381.1	390.7	400.6	410.8	2.5%
Middle East & Africa	580.6	593.8	607.3	620.9	634.9	649.0	663.4	678.0	692.9	708.0	723.4	738.9	2.2%
Total	6,126.3	6,367.2	6,618.3	6,880.1	7,153.0	7,437.6	7,734.5	8,044.3	8,367.5	8,705.0	9,057.3	9,425.2	4.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to The European Rail Industry (Union des Industries Ferroviaires Européennes), Asia Pacific and Western Europe led the growth of rolling stock manufacturing industry as of 2016. The European Rail Industry forecasts that the trend is expected to continue over the next 8 years which is expected to thrive the growth of polymer foam over the forecast period. In terms of revenue, Europe and Asia Pacific region accounted for more than 64% of the total market share as of 2017.

5.1.6 Wind

5.1.6.1 Polymer market estimates and forecasts in wind , 2014–2025 (Kilotons) (USD Million)

Table 37 Polymer foam market estimates and forecasts in wind, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	874.6	923.9	976.0	1,031.2	1,089.6	1,151.5	1,216.9	1,286.2	1,359.6	1,437.3	1,519.5	1,606.7	5.7%
Revenue (USD Million)	3,781.4	4,037.1	4,310.7	4,603.3	4,916.3	5,251.3	5,609.7	5,993.3	6,403.9	6,843.5	7,314.2	7,818.2	6.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in wind applications was valued at USD 1,031.2 million in 2017 and is projected to reach USD 1,606.7 million by 2025 expanding at a CAGR of 5.7% over the forecast period. In the wind energy applications, PVC and PET foam are used in the manufacturing of rotor blade components such as spar webs and shell panels. Owing to its high temperature resistance and continuous manufacturing ability, PET is gradually replacing PVC foam in wind turbine blade manufacturing applications.

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5.1.6.2 Polymer foam market estimates and forecasts in wind, by region, 2014–2025, (Kilotons) (USD Million)

Table 38 Polymer foam market volume in wind, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	209.0	220.6	232.9	245.9	259.5	274.0	289.2	305.3	322.3	340.2	359.1	379.1	5.6%
Europe	240.2	253.3	267.1	281.7	297.0	313.3	330.4	348.5	367.6	387.7	409.0	431.5	5.5%
Asia Pacific	334.6	355.3	377.4	401.0	426.1	452.8	481.3	511.6	543.9	578.3	615.0	654.1	6.3%
Central & South America	28.4	29.8	31.3	32.9	34.6	36.3	38.2	40.1	42.2	44.3	46.6	48.9	5.1%
Middle East & Africa	62.5	64.8	67.3	69.8	72.4	75.1	77.8	80.7	83.6	86.7	89.8	93.0	3.7%
Total	874.6	923.9	976.0	1,031.2	1,089.6	1,151.5	1,216.9	1,286.2	1,359.6	1,437.3	1,519.5	1,606.7	5.7%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in wind applications was driven by the increase in the capacity additions in the Europe and Asia Pacific as of 2017. The ambitious wind energy targets set by Asia Pacific countries, particularly China and India is expected to dominate the demand. According to Global Wind Energy Council, China aims to install 400 GW of wind capacity by 2030. Also, India aims to add 60 GW of wind installed capacity by 2022. The declining cost of wind energy generation is also expected to result in increase in adoption of wind energy in other Asia Pacific countries thereby driving the demand for polymer foam in the coming years.

Table 39 Polymer foam market revenue in wind, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	581.5	628.2	678.5	732.9	791.7	855.1	923.6	997.6	1,077.5	1,163.8	1,257.0	1,357.7	8.0%
Europe	1,094.2	1,164.2	1,238.8	1,318.4	1,403.4	1,494.1	1,590.9	1,694.3	1,804.7	1,922.7	2,048.7	2,183.5	6.5%
Asia Pacific	1,547.1	1,656.8	1,774.4	1,900.5	2,035.6	2,180.5	2,335.8	2,502.2	2,680.8	2,872.2	3,077.5	3,297.6	7.1%
Central & South America	172.6	181.9	191.7	202.1	213.0	224.5	236.6	249.4	262.9	277.2	292.2	308.1	5.4%
Middle East & Africa	385.9	406.0	427.2	449.4	472.7	497.2	522.9	549.8	578.1	607.7	638.7	671.3	5.1%
Total	3,781.4	4,037.1	4,310.7	4,603.3	4,916.3	5,251.3	5,609.7	5,993.3	6,403.9	6,843.5	7,314.2	7,818.2	6.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In the wind energy applications, polymer foams can be used in the manufacturing of turbine generator housings, nacelles, and rotor blades. On account of the increase in the turbine blade length and increase in rotor diameter, lightweight polymer foams are expected to be used in large proportion to reduce the overall weight of the wind turbine components.

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5.1.7 marine

5.1.7.1 Polymer foam market estimates and forecasts in marine, 2014–2025 (Kilotons) (USD Million)

Table 40 Polymer foam market estimates and forecasts in marine, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,018.5	1,047.6	1,077.6	1,108.6	1,140.5	1,173.4	1,207.4	1,242.3	1,278.4	1,315.6	1,353.9	1,393.5	2.9%
Revenue (USD Million)	4,294.2	4,444.7	4,600.7	4,762.6	4,930.6	5,104.9	5,285.7	5,473.5	5,668.3	5,870.7	6,080.8	6,298.9	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyurethane foams and polystyrene foams in marine industry are used in the production of boat hulls boat heads, marine sheet for boat walls, doors, decks, piping insulation, cables, cabinets, seat cushions, carpets, fenders, market buoys, anchor pendant buoys, cylindrical buoys, and others. The marine application segment was dominated by Europe followed by Asia Pacific. The revival of the shipbuilding activity and increase in cruise passenger travel are some of the factors driving the growth of polymer foam in marine industry.

5.1.7.2 Polymer foam market estimates and forecasts in marine, by region, 2014–2025, (Kilotons) (USD Million)

Table 41 Polymer foam market volume in marine, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	248.0	256.0	264.2	272.8	281.6	290.6	300.0	309.6	319.6	329.9	340.5	351.4	3.2%
Europe	297.5	305.8	314.5	323.3	332.5	341.9	351.6	361.6	371.9	382.5	393.4	404.6	2.8%
Asia Pacific	345.5	355.9	366.7	377.9	389.5	401.5	413.9	426.8	440.1	453.8	468.1	482.9	3.1%
Central & South America	40.9	41.1	41.3	41.5	41.7	41.9	42.2	42.4	42.6	42.8	43.1	43.3	0.5%
Middle East & Africa	86.7	88.8	90.9	93.0	95.2	97.4	99.7	101.9	104.2	106.6	108.9	111.3	2.3%
Total	1,018.5	1,047.6	1,077.6	1,108.6	1,140.5	1,173.4	1,207.4	1,242.3	1,278.4	1,315.6	1,353.9	1,393.5	2.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in marine industry was dominated by Europe and Asia Pacific region, which constituted for a market share of over 63% in 2017. On account of the well-established ship and boat building industry in Europe (over 3,000 companies), polymer foam manufacturers are expected to witness significant growth in this region.

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Table 42 Polymer foam market revenue in marine, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	810.8	838.9	868.0	898.1	929.2	961.3	994.5	1,028.9	1,064.4	1,101.2	1,139.2	1,178.4	3.5%
Europe	1,223.5	1,268.7	1,315.8	1,365.0	1,416.3	1,469.8	1,525.8	1,584.1	1,645.1	1,708.8	1,775.4	1,845.0	3.8%
Asia Pacific	1,595.6	1,646.6	1,699.3	1,753.7	1,810.0	1,868.2	1,928.4	1,990.7	2,055.1	2,121.8	2,190.9	2,262.4	3.2%
Central & South America	197.2	204.0	211.0	218.2	225.7	233.5	241.6	250.0	258.6	267.6	276.9	286.5	3.5%
Middle East & Africa	467.0	486.5	506.6	527.6	549.4	572.0	595.4	619.8	645.0	671.3	698.4	726.6	4.1%
Total	4,294.2	4,444.7	4,600.7	4,762.6	4,930.6	5,104.9	5,285.7	5,473.5	5,668.3	5,870.7	6,080.8	6,298.9	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The competitiveness among the shipbuilders in Asia Pacific region is increasing on account of the increase in the marine passenger travel and cruise ship deployments. According to Cruise Lines International Association, the number of cruise ships deployed in Asia increased by 53% since 2013. The same trend is expected to continue over the forecast period providing significant growth opportunities to marine grade polymer foam manufacturers over the forecast period.

5.1.8 others

5.1.8.1 Polymer foam market estimates and forecasts in others, 2014–2025 (Kilotons) (USD Million)

Table 43 Polymer foam market estimates and forecasts in others, 2014–2025 (Kilotons) (USD Million)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	861.6	881.8	901.1	919.5	936.7	952.7	967.2	980.0	991.1	1,000.0	1,006.7	1,010.9	1.2%
Revenue (USD Million)	4,349.1	4,466.8	4,581.3	4,691.8	4,797.5	4,897.4	4,990.5	5,075.7	5,151.6	5,217.0	5,270.3	5,309.8	1.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In addition to the above applications, polymer foams also find applications in the telecommunication, aerospace, sports & leisure, and medical industries. Among the various polymer foams used, PVC foam is used in aerospace applications, as the demand for high quality materials that reduce life time operating costs is increasing.

The increase in commercial passengers along with cargo fleets, especially in Asia Pacific and the Middle East, is increasing aircraft requirements. This is expected to boost the production of new aircraft over the forecast period thereby driving the demand for PVC foams. In the telecommunication industry, lightweight PVC foams are used in the construction of antenna towers, radomes, and antennas.

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5.1.8.2 Polymer foam market estimates and forecasts in others, by region, 2014–2025, (Kilotons) (USD Million)

Table 44 Polymer foam market volume in others, by region, 2014– 2025, (Kilotons)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	38.9	41.2	43.3	45.2	46.9	48.3	49.5	50.3	50.8	50.9	50.6	49.9	1.2%
Europe	257.3	262.9	268.3	273.5	278.4	283.0	287.3	291.3	294.8	297.8	300.3	302.2	1.3%
Asia Pacific	348.0	356.5	364.6	372.2	379.4	385.8	391.6	396.6	400.6	403.6	405.4	405.8	1.1%
Central & South America	91.1	93.2	95.2	97.2	99.2	101.1	102.9	104.7	106.4	108.1	109.6	111.1	1.7%
Middle East & Africa	126.3	128.0	129.7	131.3	132.9	134.4	135.8	137.2	138.5	139.7	140.8	141.8	1.0%
Total	861.6	881.8	901.1	919.5	936.7	952.7	967.2	980.0	991.1	1,000.0	1,006.7	1,010.9	1.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in Asia Pacific was estimated at 372.2 kilotons in 2017 and is projected to reach 405.8 kilotons by 2025 ascending at a CAGR of 1.1% over the forecast period.

Table 45 Polymer foam market revenue in others, by region, 2014–2025, (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 - 25)
North America	540.8	560.4	579.2	597.3	614.3	630.1	644.6	657.3	668.2	676.8	682.9	686.2	1.8%
Europe	1,332.4	1,371.2	1,409.5	1,447.3	1,484.3	1,520.2	1,554.8	1,587.9	1,619.2	1,648.3	1,674.8	1,698.4	2.0%
Asia Pacific	1,517.6	1,558.2	1,597.2	1,634.1	1,668.5	1,700.0	1,728.1	1,752.2	1,771.8	1,786.2	1,794.6	1,796.3	1.2%
Central & South America	304.6	309.6	314.4	319.0	323.3	327.3	331.0	334.3	337.3	339.8	341.8	343.2	0.9%
Middle East & Africa	653.7	667.4	680.9	694.1	707.1	719.8	732.0	743.9	755.2	766.0	776.2	785.7	1.6%
Total	4,349.1	4,466.8	4,581.3	4,691.8	4,797.5	4,897.4	4,990.5	5,075.7	5,151.6	5,217.0	5,270.3	5,309.8	1.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In Asia Pacific region, the demand for polymer foam in other application segment was valued at USD 1,634.1 million in 2017 and is projected to reach USD 1,796.3 million by 2025 progressing at a CAGR of 1.2% over the forecast period.

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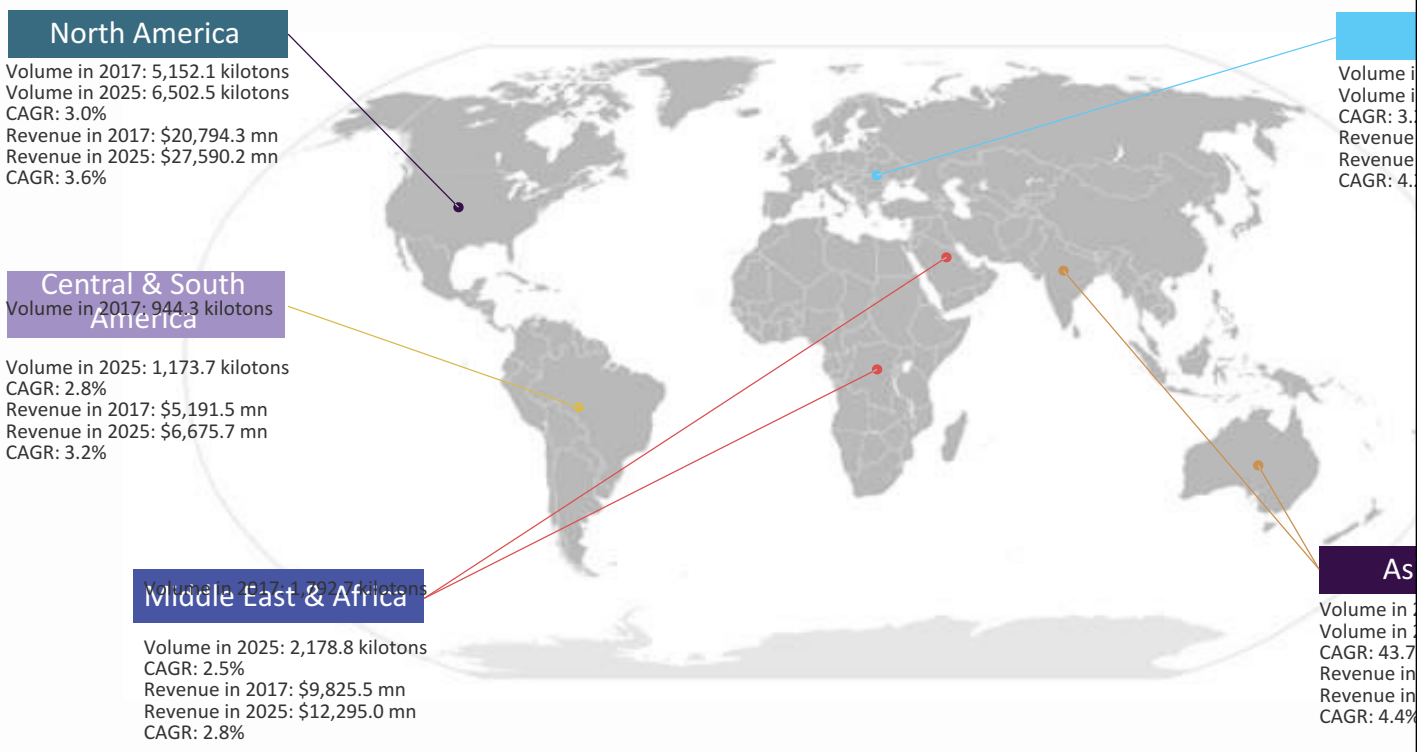
CHAPTER 06 Polymer Foam Market: Regional Estimates & Tren Analysis

FIG. 16 Regional market place: Key takeaways



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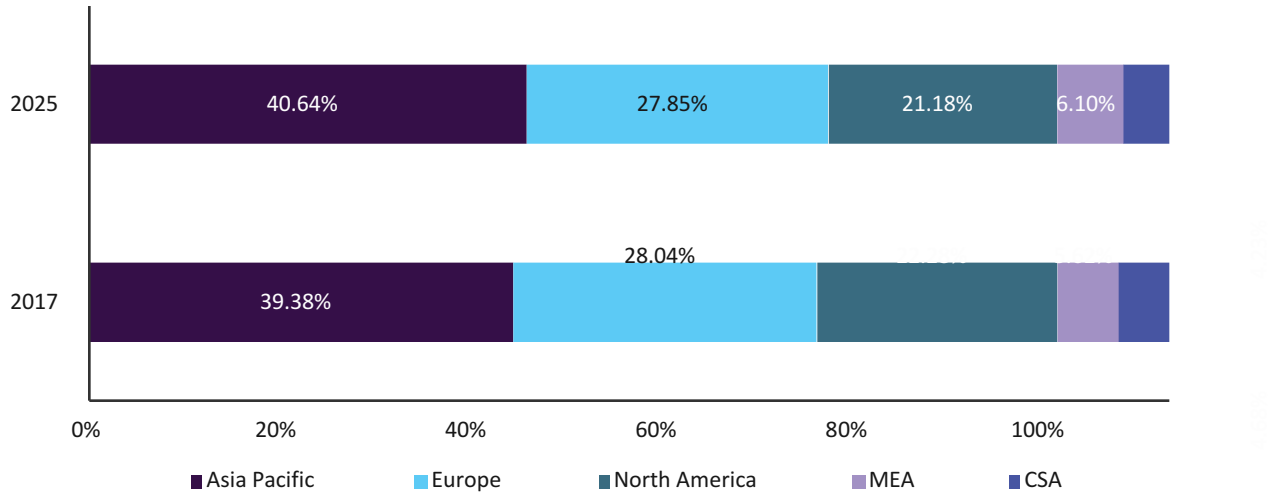
6.1 Regional movement analysis & market share, 2017 and 2025

Positive outlook in the European, North American and Asia Pacific building & construction industry on account of favorable government regulations is expected to drive the market over the forecast period.

Asia Pacific was estimated as the largest market for polymer foam in 2017, accounting for a market share of 39.38% in terms of revenue. It was followed by Europe, constituting a market share of 28.04% in 2017. North America held a market share of 22.28% in 2017, marking it as the third largest market. Middle East & Africa, Central & South America held market shares of 5.62% and 4.68%, respectively.

Asia Pacific is anticipated to witness the fastest growth over the forecast period owing to the burgeoning growth in construction, automotive, and wind energy industries in China and India. Growing at a CAGR of 4.4% between 2017 and 2025, Asia Pacific region is expected to continue its dominance in the market and acquire a market share of 40.64% by 2025.

FIG. 17 Regional outlook, 2017 & 2025 (USD Million)



Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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6.2 North America

6.2.1.1 North America polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 46 North America polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	4,721.4	4,860.8	5,004.3	5,152.1	5,304.2	5,460.8	5,622.1	5,788.1	5,959.0	6,134.9	6,316.0	6,502.5	3.0%
Revenue (USD Million)	18,698.5	19,373.0	20,071.6	20,795.2	21,544.6	22,320.7	23,124.5	23,957.0	24,819.2	25,712.2	26,636.9	27,595.0	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in North America was dominated by the U.S., which accounted for over 60% of the total revenue in 2017. North America polymer foam market is characterized by various global polyurethane foam manufacturers such as DowDuPont, BASF Corporation, and General Plastics, Inc. In terms of volume, the demand for polymer foam in North America was 5,152.1 kilotons in 2017 and is projected to reach 6,502.5 kilotons by 2025, expanding at a CAGR of 3.0% from 2018 to 2025. North America polymer foam market was valued at USD 20,795.2 million in 2017 and is projected to reach USD 27,595.0 million by 2025, advancing at a CAGR of 3.6% over the forecast period.

Various types of polyurethane foams such as rigid polyurethane foams, thermoplastic polyurethane, and flexible polyurethane foams are widely used in North America. Flexible polyurethane foam is also used in automotive, marine, and furniture & bedding industries. For instance, marine-grade flexible polyurethane foam is used in cushion seats, marine panels, deck walls, and sealing of boats. On account of its wide variety of applications, flexible polyurethane foam is expected to witness significant demand in automotive and marine industry over the forecast period.

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6.2.1.2 North America polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 47 North America polymer foam market volume, by type, 2014–2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,294.7	1,331.8	1,370.1	1,409.4	1,449.9	1,491.6	1,534.6	1,578.8	1,624.2	1,671.1	1,719.3	1,769.0	2.9%
Polystyrene Foam	927.4	949.3	971.8	994.8	1,018.3	1,042.4	1,067.0	1,092.2	1,117.9	1,144.3	1,171.2	1,198.8	2.4%
PVC Foam	818.4	846.3	875.3	905.2	936.1	968.0	1,001.0	1,035.2	1,070.5	1,107.0	1,144.7	1,183.6	3.4%
Phenolic Foam	434.0	445.1	456.5	468.3	480.3	492.6	505.2	518.1	531.4	545.0	559.0	574.4	2.6%
Polyolefin Foam	490.1	511.2	533.2	556.3	580.3	605.5	631.8	659.2	688.0	718.0	749.4	782.3	4.4%
Melamine Foam	389.7	400.4	411.4	422.8	434.6	446.7	459.1	472.0	485.3	499.1	513.2	527.9	2.8%
Others	367.2	376.6	386.0	395.4	404.7	414.1	423.3	432.5	441.6	450.5	459.2	466.6	2.1%
Total	4,721.4	4,860.8	5,004.3	5,152.1	5,304.2	5,460.8	5,622.1	5,788.1	5,959.0	6,134.9	6,316.0	6,502.5	3.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyurethane foam was driven by the increase in preference for residential polyurethane foam in the residential construction activities in the U.S., and Canada. The growth trend is expected to continue over the forecast period making the polyurethane foam segment the largest by 2025. In terms of volume, the demand for polyurethane foam was 1,409.4 kilotons in 2017 and is projected to reach 1,769.0 kilotons by 2025, progressing moderately at a CAGR of 2.9% over the forecast period.

Table 48 North America polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	4,887.3	5,057.7	5,234.0	5,416.5	5,605.3	5,800.7	6,002.9	6,212.1	6,428.6	6,652.5	6,884.3	7,124.1	3.5%
Polystyrene Foam	5,787.1	5,971.5	6,161.7	6,357.9	6,560.2	6,768.8	6,984.0	7,205.9	7,434.8	7,670.8	7,914.2	8,165.2	3.2%
PVC Foam	1,755.1	1,825.4	1,898.5	1,974.5	2,053.5	2,135.7	2,221.2	2,310.1	2,402.5	2,498.7	2,598.6	2,702.6	4.0%
Phenolic Foam	1,744.9	1,809.0	1,875.4	1,944.3	2,015.8	2,089.9	2,166.8	2,246.6	2,329.4	2,415.3	2,504.4	2,602.0	3.7%
Polyolefin Foam	1,801.1	1,885.0	1,973.0	2,065.2	2,162.0	2,263.5	2,369.9	2,481.6	2,598.8	2,721.8	2,850.9	2,986.5	4.7%
Melamine Foam	1,250.6	1,303.6	1,359.1	1,417.2	1,478.0	1,541.5	1,608.1	1,677.7	1,750.6	1,826.9	1,906.8	1,990.5	4.3%
Others	1,472.4	1,520.0	1,568.2	1,616.9	1,666.2	1,715.8	1,765.8	1,815.9	1,866.1	1,916.3	1,966.2	2,011.1	2.8%
Total	18,698.5	19,373.0	20,071.6	20,795.2	21,544.6	22,320.7	23,124.5	23,957.0	24,819.2	25,712.2	26,636.9	27,595.0	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Polyurethane foam segment was valued at USD 5,416.5 million in 2017 and is projected to reach USD 7,124.1 million by 2025, accelerating at a CAGR of 3.5% over the forecast period. Polystyrene segment followed polyurethane segment, in terms of demand, and is witnessing increase in demand owing to improved physical and mechanical properties of polymer foam desirable from building & construction sector. Owing to its flexibility and versatility, polystyrene foam can be cut into desired sheets and slabs that meet the specific building code requirements.

6.2.1.3 North America polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 49 North America polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	608.7	626.4	644.6	663.4	682.7	702.7	723.3	744.5	766.4	788.9	812.2	836.2	2.9%
Building & construction	1,830.2	1,876.7	1,924.3	1,973.3	2,023.5	2,075.0	2,127.9	2,182.2	2,237.9	2,295.0	2,353.7	2,413.9	2.6%
Furniture & bedding	344.8	352.8	360.9	369.3	377.8	386.5	395.4	404.6	413.9	423.4	433.2	443.2	2.3%
Automotive	1,119.6	1,157.2	1,196.0	1,236.1	1,277.6	1,320.4	1,364.7	1,410.5	1,457.8	1,506.7	1,557.3	1,609.5	3.4%
Rail	322.2	330.0	338.0	346.2	354.7	363.3	372.1	381.1	390.3	399.8	409.4	419.4	2.4%
Wind	209.0	220.6	232.9	245.9	259.5	274.0	289.2	305.3	322.3	340.2	359.1	379.1	5.6%
Marine	248.0	256.0	264.2	272.8	281.6	290.6	300.0	309.6	319.6	329.9	340.5	351.4	3.2%
Others	38.9	41.2	43.3	45.2	46.9	48.3	49.5	50.3	50.8	50.9	50.6	49.9	1.2%
Total	4,721.4	4,860.8	5,004.3	5,152.1	5,304.2	5,460.8	5,622.1	5,788.1	5,959.0	6,134.9	6,316.0	6,502.5	3.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Building & construction and automotive application segments accounted for the largest share in 2017. Building & construction and automotive segments together accounted for over 62% of the market share. Polymer foam finds large-scale utilization in building & construction segment; thus, this application segment accounted for the largest market share in terms of volume. The demand for polymer foam in building & construction application segment was 1,973.3 kilotons in 2017 and is projected to reach 2,413.9 kilotons by 2025, ascending at a CAGR of 2.6% over the forecast period.

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Table 50 North America polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	2,457.7	2,546.4	2,638.5	2,733.8	2,832.6	2,934.9	3,041.0	3,150.9	3,264.7	3,382.7	3,505.0	3,631.8	3.6%
Building & construction	6,970.8	7,188.4	7,412.6	7,643.8	7,882.1	8,127.7	8,380.9	8,641.9	8,910.9	9,188.1	9,473.9	9,768.6	3.1%
Furniture & bedding	1,385.6	1,421.3	1,457.9	1,495.5	1,534.0	1,573.5	1,614.0	1,655.5	1,698.1	1,741.7	1,786.4	1,832.3	2.6%
Automotive	4,728.8	4,917.6	5,113.8	5,317.8	5,529.8	5,750.3	5,979.4	6,217.6	6,465.3	6,722.7	6,990.3	7,268.5	4.0%
Rail	1,105.1	1,151.4	1,199.7	1,250.1	1,302.5	1,357.1	1,413.9	1,473.1	1,534.8	1,599.1	1,666.0	1,735.7	4.2%
Wind	581.5	628.2	678.5	732.9	791.7	855.1	923.6	997.6	1,077.5	1,163.8	1,257.0	1,357.7	8.0%
Marine	810.8	838.9	868.0	898.1	929.2	961.3	994.5	1,028.9	1,064.4	1,101.2	1,139.2	1,178.4	3.5%
Others	540.8	560.4	579.2	597.3	614.3	630.1	644.6	657.3	668.2	676.8	682.9	686.2	1.8%
Total	18,698.5	19,373.0	20,071.6	20,795.2	21,544.6	22,320.7	23,124.5	23,957.0	24,819.2	25,712.2	26,636.9	27,595.0	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Wind energy is one of the fastest growing sources of electricity in North America. The demand for polymer foam in wind application is expected to witness highest growth on account of growing need for electricity from reliable renewable energy sources. Wind application segment was valued at USD 732.9 million and is projected to reach USD 1,357.7 million by 2025, denoting a CAGR of 8.0% over the forecast period.

6.2.2 U.S.

6.2.2.1 U.S polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 51 U.S polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	2,823.4	2,895.0	2,968.4	3,043.7	3,120.9	3,200.0	3,281.1	3,364.3	3,449.7	3,537.1	3,626.8	3,718.8	2.5%
Revenue (USD Million)	11,558.7	11,935.1	12,323.6	12,724.5	13,138.1	13,564.9	14,005.3	14,459.6	14,928.4	15,412.0	15,911.0	16,426.1	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The U.S. polymer foam market was driven by the growing demand for polyurethane and polystyrene foam in building & construction and marine application and PVC foam in wind energy applications respectively. According to the U.S. Department of Housing and Urban Development, the new residential housing completions increased from approximately 900 thousand units in 2014 to 1,200 thousand units in 2018. This steady increase in residential units had driven the demand for polyurethane foam in building & construction segmentation.

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In terms of volume, the demand for polymer foam was 3,043.7 kilotons in 2017 and is projected to reach 3,718.8 kilotons by 2025, indicating a CAGR of 2.5% over the forecast period. The U.S. polymer foam market was valued at USD 12,724.5 million in 2017 and is anticipated to reach USD 16,426.1 million by 2025, registering a CAGR of 3.2% over the forecast period.

6.2.2.2 U.S polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 52 U.S polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	685.2	700.9	716.9	733.3	750.0	767.1	784.6	802.5	820.9	839.6	858.8	878.4	2.3%
Polystyrene Foam	541.5	552.7	564.1	575.7	587.6	599.7	612.1	624.8	637.6	650.8	664.2	677.9	2.1%
PVC Foam	426.9	441.7	457.1	473.0	489.5	506.5	524.1	542.3	561.2	580.7	600.9	621.8	3.5%
Phenolic Foam	282.9	289.5	296.3	303.3	310.4	317.7	325.2	332.8	340.6	348.6	356.8	366.3	2.4%
Polyolefin Foam	339.9	353.0	366.6	380.7	395.3	410.5	426.2	442.6	459.6	477.3	495.6	514.7	3.8%
Melamine Foam	275.0	280.5	286.0	291.7	297.5	303.4	309.4	315.6	321.8	328.2	334.7	341.4	2.0%
Others	271.9	276.7	281.4	286.0	290.6	295.1	299.5	303.7	307.9	311.9	315.8	318.3	1.3%
Total	2,823.4	2,895.0	2,968.4	3,043.7	3,120.9	3,200.0	3,281.1	3,364.3	3,449.7	3,537.1	3,626.8	3,718.8	2.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Flexible polyurethane foam is used in car seats, upholstered furniture, and mattresses. The demand for flexible polyurethane foam is driven by the growth in furniture and automotive markets. As per the U.S. Census Bureau, the consumer spending on the furniture and furnishings in the U.S. increased from USD 174 billion in 2014 to USD 195 billion in 2016. The rise in consumer spending on the furniture & bedding industry is expected to drive the demand for polymer foam in the coming years.

Table 53 U.S polymer foam market revenue, by type, 2014–2025, (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	2,695.4	2,779.2	2,865.7	2,954.7	3,046.6	3,141.3	3,239.0	3,339.7	3,443.5	3,550.5	3,660.9	3,774.7	3.1%
Polystyrene Foam	3,506.8	3,609.7	3,715.6	3,824.6	3,936.8	4,052.4	4,171.2	4,293.6	4,419.6	4,549.3	4,682.7	4,820.1	2.9%
PVC Foam	952.0	992.2	1,034.0	1,077.6	1,123.0	1,170.4	1,219.7	1,271.1	1,324.7	1,380.5	1,438.7	1,499.4	4.2%
Phenolic Foam	1,158.1	1,198.2	1,239.7	1,282.6	1,326.9	1,372.8	1,420.3	1,469.5	1,520.3	1,572.9	1,627.3	1,688.8	3.5%
Polyolefin Foam	1,262.0	1,314.0	1,368.3	1,424.7	1,483.5	1,544.7	1,608.5	1,674.9	1,744.0	1,815.9	1,890.9	1,968.9	4.1%
Melamine Foam	894.0	925.0	957.2	990.5	1,025.0	1,060.6	1,097.5	1,135.7	1,175.2	1,216.1	1,258.4	1,302.1	3.5%
Others	1,090.3	1,116.7	1,143.2	1,169.7	1,196.2	1,222.7	1,249.0	1,275.2	1,301.1	1,326.8	1,352.0	1,372.0	2.0%
Total	11,558.7	11,935.1	12,323.6	12,724.5	13,138.1	13,564.9	14,005.3	14,459.6	14,928.4	15,412.0	15,911.0	16,426.1	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polyurethane foam in the U.S. is expected to be moderately driven by marine industry and rail industry. The boat & ship building industry in the U.S. is characterized by manufacturers engaged in the construction of sailboats, motorboats, yachts, and inflatable boats. According to the Cruise Lines International Association, the number of cruise passengers are expected to increase in the coming years, driving the construction of cruise liners, yachts, and recreational boats. This is expected to drive the demand for polyurethane foam over the forecast period.

6.2.2.3 U.S polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 54 U.S polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	352.6	360.3	368.2	376.2	384.4	392.8	401.3	410.1	419.0	428.1	437.5	447.0	2.2%
Building & construction	1,106.2	1,128.1	1,150.5	1,173.3	1,196.6	1,220.4	1,244.6	1,269.2	1,294.4	1,320.1	1,346.3	1,373.0	2.0%
Furniture & bedding	194.8	200.1	205.5	211.1	216.8	222.7	228.7	234.9	241.3	247.8	254.5	261.4	2.7%
Automotive	680.4	700.5	721.1	742.3	764.2	786.7	809.9	833.7	858.3	883.6	909.6	936.4	2.9%
Rail	192.3	196.4	200.6	204.8	209.2	213.7	218.2	222.9	227.6	232.5	237.4	242.5	2.1%
Wind	124.5	131.0	137.7	144.8	152.3	160.2	168.5	177.2	186.4	196.0	206.1	216.8	5.2%
Marine	149.1	153.9	158.9	164.0	169.3	174.8	180.5	186.3	192.3	198.5	205.0	211.6	3.2%
Others	23.4	24.7	25.9	27.0	28.0	28.8	29.5	30.0	30.4	30.5	30.4	30.1	1.4%
Total	2,823.4	2,895.0	2,968.4	3,043.7	3,120.9	3,200.0	3,281.1	3,364.3	3,449.7	3,537.1	3,626.8	3,718.8	2.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In the automotive applications, flexible polyurethane foams are used as lightweight foams that reduce the weight of the car thereby lowering the fuel consumption and CO_2 emissions. They are used in car door panels, seat cushioning's, airbag covers, and in various automotive applications. The growth in the automotive industry is expected to drive the demand for polymer foams over the forecast period.

The U.S. High Speed Rail Association (USHSR) aims to build 17,000 kilometers of high-speed rail network in the U.S. by 2030. As a part of the expansion plans, the U.S. invested USD 2.5 billion to expand services between Boston and Washington DC. More such investments are expected in future to meet the high-speed rail expansion project by 2030, which is likely to provide lucrative growth opportunities to polymer foam manufacturers.

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Table 55 U.S polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	1,528.1	1,576.3	1,626.0	1,677.3	1,730.1	1,784.6	1,840.8	1,898.7	1,958.3	2,019.8	2,083.2	2,148.5	3.1%
Building & construction	4,309.1	4,428.5	4,551.2	4,677.2	4,806.6	4,939.4	5,075.9	5,215.9	5,359.8	5,507.4	5,659.1	5,814.8	2.8%
Furniture & bedding	856.5	875.6	895.1	915.1	935.5	956.3	977.5	999.2	1,021.4	1,044.0	1,067.1	1,090.7	2.2%
Automotive	2,923.2	3,029.6	3,139.8	3,253.9	3,372.1	3,494.6	3,621.4	3,752.7	3,888.8	4,029.6	4,175.5	4,326.6	3.6%
Rail	683.1	709.4	736.6	764.9	794.3	824.7	856.3	889.1	923.2	958.5	995.1	1,033.2	3.8%
Wind	359.5	387.0	416.6	448.5	482.8	519.7	559.4	602.1	648.1	697.6	750.9	808.2	7.6%
Marine	492.4	508.1	524.3	541.0	558.2	576.0	594.3	613.2	632.7	652.8	673.5	694.8	3.2%
Others	406.9	420.6	433.9	446.6	458.5	469.6	479.7	488.6	496.2	502.3	506.7	509.2	1.7%
Total	11,558.7	11,935.1	12,323.6	12,724.5	13,138.1	13,564.9	14,005.3	14,459.6	14,928.4	15,412.0	15,911.0	16,426.1	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for PVC foam in the U.S. was predominantly driven by the increase in the wind turbine installations. According to the American Wind Energy Association (AWEA), the installed wind energy capacity in the U.S. increased from 61.1 GW in 2014 to 84.94 GW in 2017. According to the AWEA, the share of wind energy supply to the U.S. is expected to increase from 10% in 2017 to 20% by 2020. This trend is expected to boost the demand for PVC foam in wind application over the forecast period.

The wind turbine manufacturers in the U.S. are looking for a reliable supply and in-time delivery of quality PVC foam materials. In line with the customer requirements, PVC foam manufacturers are supplying PVC foam in various grades to adapt with the turbine blade designs. The competition among the PVC foam manufacturers is expected to get intense owing to the robust growth in wind energy industry. Wind energy application segment was valued at USD 448.5 million in 2017 and is projected to reach USD 808.2 million by 2025, rising at a CAGR of 7.6% over the forecast period.

6.2.3 Canada

6.2.3.1 Canada polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 56 Canada polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,237.5	1,282.2	1,328.6	1,376.6	1,426.4	1,478.0	1,531.5	1,586.9	1,644.2	1,703.7	1,765.3	1,829.2	3.6%
Revenue (USD Million)	4,363.5	4,532.1	4,707.3	4,889.1	5,078.0	5,274.2	5,478.0	5,689.5	5,909.2	6,137.4	6,374.3	6,620.3	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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In terms of volume, the demand for polymer foam in Canada was 1,376.6 kilotons in 2017 and is projected to reach 1,829.2 kilotons by 2025, reflecting a growth rate of 3.6% over the forecast period. Polymer foam market in Canada was valued at USD 4,889.1 million in 2017 and is anticipated to reach USD 6,620.3 million by 2025, progressing at a CAGR of 3.9% over the forecast period. In terms of revenue, polyurethane foam was estimated as the largest segment accounting for 34.26% of the market share in 2017, followed by polystyrene foam, which accounted for over 31% of the market share in the same year. Polyurethane foam is expected to continue its dominance over the forecast period, accounting for over 33.88% of the market share by 2025.

6.2.3.2 Canada polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 57 Canada polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	436.5	452.6	469.4	486.9	504.9	523.6	543.1	563.2	584.1	605.8	628.2	651.5	3.7%
Polystyrene Foam	237.3	243.9	250.5	257.4	264.5	271.7	279.1	286.8	294.7	302.7	311.0	319.6	2.7%
PVC Foam	323.2	334.1	345.3	356.9	368.9	381.3	394.1	407.4	421.1	435.2	449.9	465.0	3.4%
Phenolic Foam	86.9	89.0	91.2	93.5	95.8	98.2	100.6	103.1	105.7	108.3	111.0	113.8	2.5%
Polyolefin Foam	62.4	66.7	71.3	76.3	81.6	87.3	93.3	99.8	106.8	114.2	122.1	130.6	6.9%
Melamine Foam	58.7	61.3	64.0	66.9	69.8	72.9	76.2	79.6	83.1	86.8	90.7	94.8	4.5%
Others	32.5	34.6	36.7	38.8	40.9	42.9	44.9	46.9	48.8	50.6	52.4	54.0	4.2%
Total	1,237.5	1,282.2	1,328.6	1,376.6	1,426.4	1,478.0	1,531.5	1,586.9	1,644.2	1,703.7	1,765.3	1,829.2	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The booming construction sector growth in Toronto and Vancouver is expected to drive the demand for polyurethane foam in Canada. In March 2017, the Canada government announced to launch Canada Infrastructure Bank to boost the funding of construction projects in Canada. This is expected to propel the construction growth in Canada thereby driving the demand for polyurethane foams in the forecast period.

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Polymer foams are also expected to witness moderate demand in marine industry. According to the Canadian Marine Industries and Shipbuilding Association, Canada, as a part of its National Shipbuilding Strategy, invested USD 25 billion in 2011 in modernizing its civilian and naval fleet. In 2013, Canada invested USD 3.3 billion in the construction of various vessels including coast guard vessels, offshore patrol vessels, and multi-task vessels. Such investment plans are expected to propel shipbuilding industry in Canada, thereby providing lucrative growth opportunities to polymer foam manufacturers in Canada. The demand for polyurethane foam in Canada polymer foam market was 486.9 kilotons in 2017 and is projected to reach 651.5 kilotons by 2025, expanding at a CAGR of 3.7% over the forecast period.

Table 58 Canada polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,501.2	1,557.0	1,614.9	1,675.0	1,737.3	1,801.9	1,868.9	1,938.4	2,010.5	2,085.3	2,162.8	2,243.2	3.7%
Polystyrene Foam	1,383.2	1,429.3	1,477.0	1,526.3	1,577.2	1,629.8	1,684.2	1,740.4	1,798.5	1,858.5	1,920.5	1,984.5	3.3%
PVC Foam	648.7	671.7	695.5	720.2	745.7	772.2	799.6	827.9	857.3	887.7	919.2	951.8	3.5%
Phenolic Foam	320.0	329.8	339.8	350.2	360.9	371.9	383.2	394.9	406.9	419.3	432.1	445.2	3.0%
Polyolefin Foam	208.4	224.2	241.2	259.5	279.1	300.3	323.1	347.6	374.0	402.3	432.8	465.7	7.6%
Melamine Foam	171.6	180.4	189.6	199.3	209.6	220.3	231.6	243.4	255.9	269.0	282.8	297.3	5.1%
Others	130.5	139.8	149.2	158.7	168.3	177.9	187.5	196.9	206.3	215.4	224.2	232.6	4.9%
Total	4,363.5	4,532.1	4,707.3	4,889.1	5,078.0	5,274.2	5,478.0	5,689.5	5,909.2	6,137.4	6,374.3	6,620.3	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Canada aims to invest USD 3.4 billion in strengthening its railway network in the country. As a part of it, Canada invested USD 315 million in 2017 to expand its railway infrastructure in Ontario province. More such investments to renew its existing railway infrastructure are expected in future as the passenger traffic has increased since 2009. According to Transport Canada, the rail passenger traffic in Canada increased by 4.1% from 2015 to 2016. The increase in passenger traffic is expected to result in increase in investments in rail infrastructure, thereby providing more opportunities for polymer foam manufacturers in Canada.

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6.2.3.3 Canada polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 59 Canada polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	166.9	173.8	181.0	188.4	196.1	204.2	212.6	221.4	230.5	240.0	249.8	260.1	4.1%
Building & construction	472.5	488.3	504.7	521.6	539.1	557.1	575.8	595.1	615.0	635.7	657.0	679.0	3.4%
Furniture & bedding	97.8	99.6	101.4	103.3	105.1	107.1	109.0	111.1	113.1	115.2	117.3	119.4	1.8%
Automotive	285.9	297.4	309.5	322.0	335.0	348.6	362.7	377.4	392.7	408.5	425.1	442.3	4.0%
Rail	84.3	86.7	89.3	91.9	94.5	97.3	100.1	103.0	106.1	109.1	112.3	115.6	2.9%
Wind	54.6	58.0	61.6	65.5	69.6	74.0	78.6	83.6	88.8	94.4	100.3	106.6	6.3%
Marine	65.3	67.5	69.7	72.0	74.3	76.8	79.3	81.9	84.5	87.3	90.2	93.1	3.3%
Others	10.3	10.9	11.5	12.1	12.6	13.0	13.3	13.5	13.6	13.5	13.3	13.0	0.9%
Total	1,237.5	1,282.2	1,328.6	1,376.6	1,426.4	1,478.0	1,531.5	1,586.9	1,644.2	1,703.7	1,765.3	1,829.2	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyurethane foams enable automotive manufacturers to design and develop cars with comfort and safety. they are also recyclable and are light in weight and thus enhances the vehicle fuel efficiency. In 2018, The Strategic Innovation Fund (SIF) of Canada allocated USD 33 million for developing Canadian automotive manufacturing sector to support automotive manufacturers that develop environmental friendly and energy efficient vehicles.

Table 60 Canada polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	568.1	591.1	615.1	640.0	665.9	692.9	721.0	750.2	780.5	812.1	845.0	879.2	4.0%
Building & construction	1,626.7	1,681.6	1,738.4	1,797.1	1,857.8	1,920.5	1,985.3	2,052.4	2,121.6	2,193.2	2,267.1	2,343.6	3.4%
Furniture & bedding	323.3	332.5	341.9	351.6	361.6	371.8	382.3	393.2	404.3	415.7	427.5	439.6	2.8%
Automotive	1,103.5	1,150.4	1,199.3	1,250.3	1,303.4	1,358.7	1,416.5	1,476.6	1,539.3	1,604.7	1,672.8	1,743.8	4.2%
Rail	257.9	269.4	281.4	293.9	307.0	320.7	334.9	349.9	365.4	381.7	398.7	416.4	4.5%
Wind	135.7	147.0	159.1	172.3	186.6	202.1	218.8	236.9	256.5	277.8	300.8	325.7	8.3%
Marine	194.6	201.6	208.8	216.3	224.1	232.1	240.4	249.0	257.9	267.2	276.8	286.7	3.6%
Others	36.2	38.1	39.9	41.6	43.3	44.7	46.1	47.3	48.2	49.0	49.5	49.7	2.2%
Total	4,363.5	4,532.1	4,707.3	4,889.1	5,078.0	5,274.2	5,478.0	5,689.5	5,909.2	6,137.4	6,374.3	6,620.3	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The wind turbine manufacturers are increasing on account of increase in the capacity addition in Canada since 2015. Some of the major wind turbine manufacturers and OEMs operating in Canada are ENERCON GmbH, ACCIONA, S.A., Vestas Wind Systems A/S, Senvion S.A., General Electric, and Siemens Gamesa Renewable Energy, S.A. The increase in the competition among the wind energy turbine manufacturers is expected to result in improvement in wind turbine design with the use of high-performance PVC and other foams.

6.2.4 Mexico

6.2.4.1 Mexico polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 61 Mexico polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	660.5	683.6	707.3	731.8	756.9	782.8	809.4	836.9	865.1	894.1	923.9	954.6	3.4%
Revenue (USD Million)	2,776.3	2,905.7	3,040.7	3,181.5	3,328.4	3,481.6	3,641.3	3,807.9	3,981.6	4,162.7	4,351.6	4,548.6	4.6%

Source: ICIS, OICA, MEXICOEPA, UEIL, ILMA, ECHA, UNIDO, MEXICOITC, AIA, World Steel Association, Grand View Research

In terms of volume, the demand for polymer foam in Mexico was 731.8 kilotons in 2017 and is projected to reach 954.6 kilotons by 2025, advancing at a CAGR of 3.4% over the forecast period. The polymer foam market in Mexico was valued at USD 3,181.5 million in 2017 and is anticipated to reach USD 4,548.6 million by 2025, progressing at a CAGR of 4.6% over the forecast period. Polyurethane foam was the largest segment on account of increase in the investment in rail infrastructure and building & construction sector by Mexican government.

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6.2.4.2 Mexico polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 62 Mexico polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	173.0	178.3	183.7	189.3	195.0	200.9	206.9	213.0	219.3	225.7	232.3	239.0	3.0%
Polystyrene Foam	148.5	152.6	156.9	161.2	165.7	170.2	174.8	179.5	184.4	189.3	194.3	199.4	2.7%
PVC Foam	68.2	70.5	72.8	75.2	77.7	80.2	82.8	85.5	88.2	91.0	93.9	96.9	3.2%
Phenolic Foam	64.2	66.5	69.0	71.4	74.0	76.7	79.4	82.2	85.1	88.1	91.1	94.3	3.5%
Polyolefin Foam	87.8	91.5	95.3	99.3	103.4	107.7	112.2	116.8	121.6	126.5	131.7	137.0	4.1%
Melamine Foam	56.1	58.7	61.4	64.3	67.2	70.3	73.5	76.9	80.4	84.0	87.8	91.7	4.5%
Others	62.7	65.4	68.1	71.0	73.8	76.8	79.9	83.0	86.2	89.4	92.8	96.2	3.9%
Total	660.5	683.6	707.3	731.8	756.9	782.8	809.4	836.9	865.1	894.1	923.9	954.6	3.4%

Source: ICIS, OICA, MEXICOEPA, UEIL, ILMA, ECHA, UNIDO, MEXICOITC, AIA, World Steel Association, Grand View Research

The demand for PVC foam is expected to be driven by the increase in the wind turbine blade manufacturing capabilities in Mexico. For instance, Vestas, one of the global wind turbine manufacturing companies, collaborated with TPI Composites, Inc. to increase the turbine blade production capacity in Mexico. In terms of volume, the demand for PVC foam was 75.2 kilotons in 2017 and is anticipated to reach 96.9 kilotons by 2025, advancing at a CAGR of 3.2% over the forecast period.

Table 63 Mexico polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	690.6	721.4	753.5	786.8	821.5	857.5	895.0	934.0	974.6	1,016.7	1,060.6	1,106.1	4.3%
Polystyrene Foam	897.1	932.5	969.1	1,006.9	1,046.1	1,086.6	1,128.5	1,171.9	1,216.7	1,263.1	1,311.0	1,360.5	3.8%
PVC Foam	154.4	161.6	169.0	176.7	184.8	193.2	202.0	211.1	220.6	230.4	240.7	251.5	4.5%
Phenolic Foam	266.7	281.0	295.9	311.5	328.0	345.2	363.3	382.3	402.2	423.1	445.0	468.0	5.2%
Polyolefin Foam	330.7	346.8	363.5	381.0	399.3	418.4	438.3	459.1	480.9	503.5	527.2	551.9	4.7%
Melamine Foam	185.0	198.2	212.3	227.4	243.4	260.6	279.0	298.6	319.5	341.8	365.7	391.1	7.0%
Others	251.6	264.0	276.9	290.2	304.0	318.3	333.1	348.3	364.1	380.5	397.3	414.7	4.6%
Total	2,776.3	2,905.5	3,040.2	3,180.6	3,327.1	3,479.9	3,639.2	3,805.3	3,978.5	4,159.1	4,347.4	4,543.8	4.6%

Source: ICIS, OICA, MEXICOEPA, UEIL, ILMA, ECHA, UNIDO, MEXICOITC, AIA, World Steel Association, Grand View Research

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Polyurethane foam was estimated as the largest segment in 2017 on account of the increase in the investment in boosting the infrastructure projects in Mexico. The increase in the growth of polyurethane foam segment was attributed to the National Infrastructure program announced for the period 2014-2018. The same trend is expected to continue in the coming years and the polyurethane foam segment is expected to continue its dominance over the forecast period.

6.2.4.3 Mexico polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 64 Mexico polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	89.1	92.2	95.5	98.8	102.2	105.7	109.3	113.1	116.9	120.8	124.9	129.1	3.4%
Building & construction	251.5	260.2	269.1	278.3	287.8	297.5	307.5	317.8	328.4	339.3	350.5	362.0	3.3%
Furniture & bedding	52.2	53.1	54.0	54.9	55.8	56.8	57.7	58.6	59.5	60.5	61.4	62.3	1.6%
Automotive	153.3	159.3	165.4	171.7	178.3	185.1	192.1	199.4	206.8	214.6	222.6	230.8	3.8%
Rail	45.6	46.9	48.2	49.6	50.9	52.3	53.7	55.2	56.7	58.2	59.7	61.3	2.7%
Wind	29.9	31.7	33.5	35.5	37.6	39.8	42.1	44.5	47.1	49.8	52.6	55.7	5.8%
Marine	33.6	34.6	35.7	36.8	37.9	39.1	40.3	41.5	42.7	44.0	45.3	46.7	3.0%
Others	5.2	5.5	5.8	6.1	6.3	6.6	6.7	6.8	6.9	6.9	6.9	6.8	1.3%
Total	660.5	683.6	707.3	731.8	756.9	782.8	809.4	836.9	865.1	894.1	923.9	954.6	3.4%

Source: ICIS, OICA, MEXICOEPA, UEIL, ILMA, ECHA, UNIDO, MEXICOITC, AIA, World Steel Association, Grand View Research

In addition to the urban rail passenger travel, the tourist rail passenger travel in Mexico also increased since 2015. The Mexican government announced that it is going to invest in new rail line in Yucatan Peninsula, which connects some of the popular tourist destinations in Mexico. Approximately, USD 5.2 billion is estimated to be invested in this new rail line, which is expected to commence its operations in 2019. The new rail project investments in Mexico are expected to boost the demand for polymer foam over the forecast period. The demand for polymer foam in rail application was 49.6 kilotons in 2017 and is anticipated to reach 61.3 kilotons by 2025, accelerating at a CAGR of 2.7% over the forecast period.

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Table 65 Mexico polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	361.5	379.0	397.3	416.5	436.5	457.4	479.2	502.1	525.9	550.8	576.9	604.1	4.8%
Building & construction	1,035.0	1,078.2	1,123.0	1,169.5	1,217.7	1,267.8	1,319.7	1,373.6	1,429.5	1,487.5	1,547.7	1,610.2	4.1%
Furniture & bedding	205.7	213.2	220.9	228.8	237.0	245.4	254.1	263.1	272.4	282.0	291.8	302.0	3.5%
Automotive	702.1	737.6	774.7	813.6	854.3	896.9	941.5	988.3	1,037.2	1,088.4	1,142.0	1,198.1	5.0%
Rail	164.1	172.7	181.8	191.3	201.2	211.7	222.6	234.1	246.2	258.9	272.2	286.1	5.2%
Wind	86.3	94.2	102.8	112.1	122.3	133.4	145.4	158.6	172.9	188.4	205.4	223.8	9.0%
Marine	123.8	129.2	134.9	140.8	146.9	153.2	159.8	166.7	173.8	181.2	188.9	197.0	4.3%
Others	97.7	101.6	105.4	109.1	112.6	115.8	118.8	121.4	123.7	125.5	126.7	127.4	2.0%
Total	2,776.3	2,905.7	3,040.7	3,181.5	3,328.4	3,481.6	3,641.3	3,807.9	3,981.6	4,162.7	4,351.6	4,548.6	4.6%

Source: ICIS, OICA, MEXICOEPA, UEIL, ILMA, ECHA, UNIDO, MEXICOITC, AIA, World Steel Association, Grand View Research

As of 2017, Mexico is the 4th largest exporter of automotive vehicles globally and the largest exporter of vehicles to the U.S. According to Industria Nacional de Autopartes, the exports of new light vehicles from Mexico to the U.S. increased by 16.7% in 2017 as compared to 2016. The new automotive OEMs such as Kia-Monterrey plant, Audi-San Jose Chiapa, Toyota-Celaya, BMW-San Luis Potosi are expected to further drive the production of automotive manufacturing in Mexico there by propelling the demand for polymer foams over the forecast period.

6.3 Europe

6.3.1 Europe polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 66 Europe polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	5,782.0	5,969.6	6,163.4	6,363.4	6,569.9	6,783.1	7,003.2	7,230.5	7,465.2	7,707.4	7,957.6	8,215.8	3.2%
Revenue (USD Million)	25,061.3	26,102.0	27,187.0	28,318.1	29,497.6	30,727.6	32,010.4	33,348.5	34,744.5	36,201.1	37,721.1	39,307.4	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polymer foam in Europe was 6,363.4 kilotons in 2017 and is projected to reach 8,215.8 kilotons by 2025, advancing at a CAGR of 3.2% over the forecast period. The polymer foam market in Europe was valued at USD 28,318.1 million in 2017 and is anticipated to reach USD 39,307.4 million by 2025, advancing at a CAGR of 4.2% over the forecast period. Germany dominated the demand for polymer foam in Europe, which accounted for over 22.77% of the market share in terms of revenue in 2017 and is estimated to continue its dominance till 2025, acquiring a market share of 20.90% over the forecast period. Germany is followed by Russia, which accounted for a market share of 14.93% in 2017 and is estimated to attain a share of 14.59% by 2025.

6.3.2 Europe polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 67 Europe polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,448.0	1,486.6	1,526.2	1,566.9	1,608.6	1,651.4	1,695.3	1,740.3	1,786.5	1,833.9	1,882.6	1,932.5	2.7%
Polystyrene Foam	1,314.5	1,346.1	1,378.5	1,411.7	1,445.6	1,480.4	1,516.1	1,552.6	1,590.0	1,628.3	1,667.6	1,707.8	2.4%
PVC Foam	850.5	880.3	911.2	943.2	976.4	1,010.7	1,046.2	1,083.0	1,121.2	1,160.7	1,201.6	1,243.9	3.5%
Phenolic Foam	615.4	639.2	663.9	689.7	716.4	744.2	773.1	803.2	834.4	866.9	900.7	935.8	3.9%
Polyolefin Foam	752.3	786.5	822.2	859.6	898.8	939.8	982.7	1,027.6	1,074.6	1,123.9	1,175.4	1,229.4	4.6%
Melamine Foam	483.8	504.3	525.8	548.2	571.5	595.9	621.3	647.8	675.4	704.3	734.3	765.7	4.3%
Others	317.4	326.5	335.5	344.2	352.6	360.8	368.6	376.0	383.0	389.5	395.4	400.6	1.9%
Total	5,782.0	5,969.6	6,163.4	6,363.4	6,569.9	6,783.1	7,003.2	7,230.5	7,465.2	7,707.4	7,957.6	8,215.8	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In terms of volume, PVC foam was one of the largest segment in 2017, accounting for 14.82% of the market share. It is projected to hold 15.14% of the market share by 2025. The demand for PVC foam is driven by the presence of numerous wind turbine manufacturers such as Siemens Gamesa Renewable Energy, S.A., ENERCON GmbH, ACCIONA, S.A., Vestas Wind Systems A/S, Senvion S.A., General Electric, SIVA Group, and Wind Size GmbH that are located in Europe. According to WindEurope, the investments in offshore wind energy projects in Europe increased from USD 10.03 billion in 2014 to USD 20.75 billion in 2016. The investment trend in offshore wind energy is expected to continue over the forecast period, thereby driving the demand for PVC foam in the coming years.

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Table 68 Europe polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	5,978.5	6,184.9	6,398.2	6,618.7	6,846.7	7,082.2	7,325.7	7,577.3	7,837.3	8,106.0	8,383.7	8,670.6	3.4%
Polystyrene Foam	7,828.6	8,092.8	8,365.4	8,646.7	8,937.0	9,236.6	9,545.7	9,864.6	10,193.7	10,533.1	10,883.2	11,244.4	3.3%
PVC Foam	2,095.5	2,195.0	2,299.3	2,408.6	2,523.2	2,643.4	2,769.4	2,901.5	3,040.1	3,185.4	3,337.8	3,497.7	4.8%
Phenolic Foam	2,628.1	2,760.6	2,900.1	3,047.0	3,201.7	3,364.8	3,536.6	3,717.6	3,908.3	4,109.4	4,321.3	4,544.7	5.1%
Polyolefin Foam	3,057.0	3,242.5	3,439.7	3,649.3	3,872.1	4,108.9	4,360.8	4,628.7	4,913.7	5,216.9	5,539.5	5,882.8	6.2%
Melamine Foam	1,881.0	1,988.4	2,102.1	2,222.2	2,349.1	2,483.4	2,625.2	2,775.2	2,933.8	3,101.3	3,278.5	3,465.7	5.7%
Others	1,592.5	1,637.8	1,682.3	1,725.7	1,767.8	1,808.3	1,847.0	1,883.6	1,917.7	1,949.0	1,977.1	2,001.5	1.9%
Total	25,061.3	26,102.0	27,187.0	28,318.1	29,497.6	30,727.6	32,010.4	33,348.5	34,744.5	36,201.1	37,721.1	39,307.4	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polystyrene foam is used in the production of expanded polystyrene foam blocks that can be used in the construction of railway platforms. The growth in polymer foam is attributed to increase in the investments by the Central & Eastern European countries such as Bulgaria, Czech Republic, Croatia, Hungary, Poland, Portugal, and others. The European Commission developed Connecting Europe Facility (CEF) and allocated approximately USD 27 billion for railway infrastructure development by 2020. The polystyrene foam market recorded a value of USD 8,646.7 million in 2017 and is projected to reach USD 11,244.4 million by 2025, advancing at a CAGR of 3.3% over the forecast period.

6.3.3 Europe polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 69 Europe polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	787.4	814.0	841.6	870.1	899.5	930.0	961.6	994.3	1,028.1	1,063.0	1,099.2	1,136.7	3.4%
Building & construction	1,974.4	2,036.2	2,100.0	2,165.8	2,233.7	2,303.7	2,375.9	2,450.5	2,527.4	2,606.8	2,688.7	2,773.2	3.1%
Furniture & bedding	497.8	508.9	520.2	531.8	543.7	555.8	568.2	580.9	593.8	607.0	620.6	634.4	2.2%
Automotive	1,357.0	1,403.9	1,452.3	1,502.4	1,554.3	1,607.9	1,663.4	1,720.8	1,780.2	1,841.7	1,905.2	1,970.9	3.5%
Rail	370.4	384.6	399.4	414.8	430.8	447.4	464.7	482.7	501.4	520.9	541.2	562.3	3.9%
Wind	240.2	253.3	267.1	281.7	297.0	313.3	330.4	348.5	367.6	387.7	409.0	431.5	5.5%
Marine	297.5	305.8	314.5	323.3	332.5	341.9	351.6	361.6	371.9	382.5	393.4	404.6	2.8%
Others	257.3	262.9	268.3	273.5	278.4	283.0	287.3	291.3	294.8	297.8	300.3	302.2	1.3%
Total	5,782.0	5,969.6	6,163.4	6,363.4	6,569.9	6,783.1	7,003.2	7,230.5	7,465.2	7,707.4	7,957.6	8,215.8	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polymer foam in building & construction and automotive applications dominated the market, together accounting for a market share of over 57% in 2017. The demand for polymer foam in wind applications is expected to witness the highest growth over the forecast period, growing at a CAGR of 5.5% over the forecast period, the market share of polymer foam in wind applications is expected to marginally increase from 4.66% in 2017 to 5.55% by 2025.

Table 70 Europe polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	3,376.0	3,528.9	3,689.1	3,856.7	4,032.2	4,216.1	4,408.7	4,610.4	4,821.9	5,043.4	5,275.7	5,519.3	4.6%
Building & construction	8,402.5	8,736.1	9,083.2	9,444.3	9,820.1	10,211.1	10,618.1	11,041.8	11,482.8	11,942.1	12,420.2	12,918.2	4.0%
Furniture & bedding	2,065.1	2,137.0	2,211.4	2,288.4	2,368.1	2,450.8	2,536.4	2,625.0	2,716.9	2,812.1	2,910.7	3,013.0	3.5%
Automotive	5,863.4	6,116.5	6,380.8	6,657.0	6,945.4	7,246.8	7,561.7	7,890.8	8,234.9	8,594.5	8,970.5	9,363.7	4.4%
Rail	1,704.1	1,779.4	1,858.4	1,941.1	2,027.8	2,118.7	2,214.1	2,314.1	2,419.1	2,529.3	2,644.9	2,766.5	4.5%
Wind	1,094.2	1,164.2	1,238.8	1,318.4	1,403.4	1,494.1	1,590.9	1,694.3	1,804.7	1,922.7	2,048.7	2,183.5	6.5%
Marine	1,223.5	1,268.7	1,315.8	1,365.0	1,416.3	1,469.8	1,525.8	1,584.1	1,645.1	1,708.8	1,775.4	1,845.0	3.8%
Others	1,332.4	1,371.2	1,409.5	1,447.3	1,484.3	1,520.2	1,554.8	1,587.9	1,619.2	1,648.3	1,674.8	1,698.4	2.0%
Total	25,061.3	26,102.0	27,187.0	28,318.1	29,497.6	30,727.6	32,010.4	33,348.5	34,744.5	36,201.1	37,721.1	39,307.4	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in marine applications was valued at USD 1,365.0 million in 2017 and is projected to reach USD 1,845.0 million by 2025, progressing at a CAGR of 3.8% over the forecast period. European boatbuilding industry is one of the largest industries in the world. According to the European Boating Industry, the boatbuilding sector consists of over 3,000 companies. According to The European Competitiveness and Sustainable Industrial Policy Consortium, the demand for polyurethane foam is expected to witness rise in demand on account of the increase in the construction of charter boats in Europe, particularly in Northern European countries.

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6.3.4 Germany

6.3.4.1 Germany polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 71 Germany polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,392.9	1,435.9	1,480.2	1,526.0	1,573.1	1,621.7	1,671.7	1,723.4	1,776.6	1,831.5	1,888.0	1,946.3	3.1%
Revenue (USD Million)	5,566.4	5,761.2	5,963.0	6,172.1	6,388.7	6,613.1	6,845.6	7,086.4	7,336.0	7,594.5	7,862.4	8,140.0	3.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Germany is the largest market in terms of polymer foam demand in Europe. The demand for polymer foam in Germany is dominated by the polyurethane foam as the second largest segment, which accounted for over 23.24% of the market share in terms of revenue in 2017. The demand is primarily driven by high investments in building & construction industry by German government. The demand for polymer foam in Germany was estimated at 1,526.0 kilotons in 2017 and is projected to reach 1,946.3 kilotons by 2025, advancing at a CAGR of 3.1% over the forecast period. Polymer foam market recorded a revenue of USD 6,172.1 million in 2017 and is projected to reach USD 8,140.0 million by 2025, progressing at a CAGR of 3.5% over the forecast period.

6.3.4.2 Germany polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 72 Germany polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Polyurethane Foam	336.8	345.4	354.3	363.4	372.7	382.3	392.1	402.2	412.5	423.1	434.0	445.1	2.6%
Polystyrene Foam	309.2	316.9	324.7	332.8	341.0	349.5	358.2	367.1	376.2	385.5	395.0	404.8	2.5%
PVC Foam	222.6	229.9	237.4	245.3	253.3	261.6	270.2	279.1	288.3	297.8	307.5	317.6	3.3%
Phenolic Foam	156.0	161.7	167.6	173.7	180.0	186.6	193.4	200.4	207.7	215.3	223.1	231.2	3.6%
Polyolefin Foam	183.9	191.5	199.4	207.7	216.3	225.2	234.5	244.2	254.4	264.9	275.9	287.3	4.1%
Melamine Foam	140.4	145.8	151.4	157.3	163.4	169.7	176.2	183.0	190.1	197.4	205.0	212.9	3.9%
Others	44.0	44.7	45.3	45.9	46.4	46.8	47.1	47.4	47.5	47.6	47.5	47.3	0.4%
Total	1,392.9	1,435.9	1,480.2	1,526.0	1,573.1	1,621.7	1,671.7	1,723.4	1,776.6	1,831.5	1,888.0	1,946.3	3.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polyurethane foam is expected to witness significant growth on account of the increase in the investments in the Germany building sector. According to German Trade & Invest (GTAI), USD 22 billion were allocated by the European Union for the period 2014 to 2020 to support infrastructure projects in Germany. This is expected to boost the growth of polymer foam over the forecast period.

In terms of volume, the PVC foam segment was one of the dominating segment in the market, which accounted for 16.07% of the total market share in 2017. Germany was the largest wind energy market in Europe, in terms of new installed capacity of over 5.8 GW in 2015. The shift in the approach of wind turbine manufacturers toward manufacturing turbines with large turbine blades in offshore wind energy projects is expected to drive the demand for lightweight PVC foam materials in the coming years.

Table 73 Germany polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,325.1	1,360.6	1,397.1	1,434.6	1,473.1	1,512.6	1,553.2	1,594.8	1,637.6	1,681.5	1,726.6	1,772.9	2.7%
Polystyrene Foam	1,610.3	1,657.0	1,705.0	1,754.4	1,805.3	1,857.7	1,911.5	1,966.9	2,024.0	2,082.7	2,143.1	2,205.2	2.9%
PVC Foam	466.9	483.9	501.5	519.8	538.7	558.4	578.7	599.8	621.6	644.2	667.7	692.0	3.6%
Phenolic Foam	746.4	777.8	810.6	844.7	880.3	917.4	956.0	996.3	1,038.3	1,082.0	1,127.6	1,175.1	4.2%
Polyolefin Foam	751.1	787.7	826.0	866.3	908.5	952.8	999.2	1,047.9	1,099.0	1,152.5	1,208.7	1,267.6	4.9%
Melamine Foam	490.1	513.8	538.6	564.6	591.9	620.5	650.4	681.9	714.8	749.3	785.5	823.5	4.8%
Others	176.5	180.4	184.1	187.6	190.9	193.8	196.5	198.9	200.8	202.3	203.3	203.8	1.0%
Total	5,566.4	5,761.2	5,963.0	6,172.1	6,388.7	6,613.1	6,845.6	7,086.4	7,336.0	7,594.5	7,862.4	8,140.0	3.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In Germany, the demand for polystyrene foam was estimated as the largest in terms of revenue. The polyurethane segment was valued at USD 1,754.4 million in 2017 and is projected to reach USD 2,205.2 million by 2025, advancing at a CAGR of 2.9% over the forecast period.

The demand for polyolefin foam in packaging segment has increased considerably due to the growing acceptance of variable sizes of plastic packaging, increasing distribution network of plastic manufacturers and plastic merchandises, and the growing demand for flexible plastic packaging materials in the country.

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6.3.4.3 Germany polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 74 Germany polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	198.5	205.3	212.3	219.6	227.2	235.0	243.0	251.4	260.0	268.9	278.1	287.7	3.4%
Building & construction	480.7	493.1	505.8	518.9	532.3	546.0	560.1	574.6	589.4	604.6	620.2	636.3	2.6%
Furniture & bedding	118.3	120.4	122.6	124.8	127.1	129.4	131.8	134.2	136.6	139.1	141.6	144.2	1.8%
Automotive	349.6	361.1	373.0	385.2	397.9	411.0	424.5	438.5	452.9	467.8	483.2	499.0	3.3%
Rail	76.7	80.5	84.4	88.6	92.9	97.5	102.2	107.2	112.5	118.0	123.8	129.8	4.9%
Wind	55.4	58.6	61.9	65.4	69.1	73.0	77.1	81.5	86.1	91.0	96.2	101.6	5.7%
Marine	67.7	69.6	71.6	73.6	75.7	77.8	80.1	82.3	84.7	87.1	89.5	92.1	2.8%
Others	46.0	47.3	48.6	49.8	50.9	52.0	52.9	53.7	54.4	55.0	55.4	55.7	1.4%
Total	1,392.9	1,435.9	1,480.2	1,526.0	1,573.1	1,621.7	1,671.7	1,723.4	1,776.6	1,831.5	1,888.0	1,946.3	3.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the German Association of the Automotive Industry (VDA), Germany is Europe's largest automotive market. In 2017, Germany accounted for 20% of the total new car registrations in the world. Germany is expected to continue as the dominant market in the world driving the demand for the polymer foam in the automotive segment.

Table 75 Germany polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	850.0	882.1	915.4	950.0	985.9	1,023.2	1,062.0	1,102.3	1,144.1	1,187.6	1,232.7	1,279.6	3.8%
Building & construction	1,686.0	1,747.5	1,811.3	1,877.4	1,946.0	2,017.2	2,091.0	2,167.6	2,247.1	2,329.6	2,415.1	2,503.9	3.7%
Furniture & bedding	448.1	460.7	473.8	487.2	501.0	515.2	529.8	544.9	560.4	576.3	592.8	609.7	2.8%
Automotive	1,441.1	1,491.0	1,542.6	1,596.1	1,651.5	1,708.8	1,768.2	1,829.7	1,893.4	1,959.4	2,027.7	2,098.5	3.5%
Rail	373.5	385.0	396.9	409.2	421.8	434.9	448.4	462.3	476.7	491.5	506.8	522.6	3.1%
Wind	287.2	302.4	318.3	335.1	352.8	371.5	391.1	411.8	433.6	456.6	480.8	506.3	5.3%
Marine	271.6	277.5	283.4	289.5	295.7	302.1	308.6	315.3	322.1	329.1	336.2	343.5	2.2%
Others	208.7	215.0	221.3	227.6	233.9	240.2	246.4	252.5	258.6	264.5	270.3	275.9	2.4%
Total	5,566.4	5,761.2	5,963.0	6,172.1	6,388.7	6,613.1	6,845.6	7,086.4	7,336.0	7,594.5	7,862.4	8,140.0	3.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Offshore wind energy is one of the fastest-growing industry in Germany. According to the Global Wind Energy Council, in 2017, Germany alone accounted for over 40% of the total offshore wind capacity across the globe. Germany aims to increase its offshore wind capacity from 5.35 GW in 2017 to over 25 GW by 2030. The proposed capacity additions are expected to drive the demand for polymer foam in wind energy application over the forecast period.

6.3.5 France

6.3.5.1 France polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 76 France polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	746.5	768.3	790.8	814.0	837.8	862.3	887.6	913.6	940.3	967.8	996.2	1,025.3	2.9%
Revenue (USD Million)	3,268.4	3,401.9	3,541.1	3,686.3	3,837.8	3,995.8	4,160.6	4,332.7	4,512.2	4,699.7	4,895.3	5,099.7	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In terms of volume, the demand for polymer foam in France was 814.0 kilotons in 2017 and is projected to reach 1,025.3 kilotons by 2025, growing at a CAGR of 2.9% over the forecast period. The France polymer foam market recorded a revenue of USD 3,686.3 million in 2017 and is projected to reach USD 5,099.7 million by 2025, ascending at a CAGR of 4.0% over the forecast period. In 2017, France accounted for 12.79% (in terms of volume) of the polymer foam demand in Europe and its share is expected to marginally decrease, to reach 12.48% by 2025.

6.3.5.2 France polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 77 France polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Polyurethane Foam	173.1	177.3	181.6	186.0	190.5	195.2	199.9	204.8	209.7	214.8	220.0	225.4	2.4%
Polystyrene Foam	159.3	162.8	166.5	170.2	173.9	177.8	181.8	185.8	190.0	194.2	198.5	202.9	2.2%
PVC Foam	111.6	115.1	118.7	122.4	126.2	130.2	134.2	138.4	142.8	147.2	151.8	156.6	3.1%
Phenolic Foam	93.1	95.7	98.4	101.2	104.0	107.0	110.0	113.1	116.3	119.6	123.0	126.4	2.8%
Polyolefin Foam	100.3	104.3	108.4	112.7	117.2	121.9	126.7	131.7	136.9	142.4	148.0	153.9	4.0%
Melamine Foam	74.2	77.0	79.9	82.9	86.0	89.2	92.6	96.1	99.7	103.4	107.3	111.4	3.8%
Others	34.9	36.1	37.3	38.6	39.8	41.1	42.4	43.7	44.9	46.2	47.5	48.8	3.0%
Total	746.5	768.3	790.8	814.0	837.8	862.3	887.6	913.6	940.3	967.8	996.2	1,025.3	2.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polyurethane foam in France is expected to be driven by the increase in investments in building & construction and wind energy projects. However, the wind energy capacity additions in France is expected to be slower owing to the legal challenges faced by wind energy turbine OEMs in France.

Table 78 France polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	721.3	744.8	769.1	794.1	820.0	846.7	874.3	902.8	932.2	962.5	993.9	1,026.3	3.3%
Polystyrene Foam	955.8	991.5	1,028.7	1,067.2	1,107.1	1,148.6	1,191.6	1,236.2	1,282.5	1,330.5	1,380.3	1,432.0	3.7%
PVC Foam	282.7	294.9	307.6	320.9	334.7	349.1	364.1	379.8	396.2	413.2	431.0	449.6	4.3%
Phenolic Foam	387.9	399.2	410.8	422.8	435.2	447.9	461.0	474.4	488.3	502.5	517.2	532.3	2.9%
Polyolefin Foam	418.0	442.8	469.0	496.8	526.3	557.5	590.5	625.5	662.5	701.8	743.4	787.4	5.9%
Melamine Foam	309.2	328.7	349.5	371.6	395.0	420.0	446.5	474.7	504.7	536.6	570.5	606.6	6.3%
Others	193.4	199.9	206.4	212.9	219.5	226.0	232.6	239.3	245.9	252.5	259.0	265.6	2.8%
Total	3,268.4	3,401.9	3,541.1	3,686.3	3,837.8	3,995.8	4,160.6	4,332.7	4,512.2	4,699.7	4,895.3	5,099.7	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to The Comité des Constructeurs Français d'Automobiles (CCFA), the French automotive industry is prospering with an average annual production of over 6 million vehicles. In 2015, the automotive industry registered a growth of 6.8% between the period 2014 and 2015. The upward trend is expected to continue over the coming years driving the demand for polymer foam over the forecast period.

6.3.5.3 France polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 79 France polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	108.2	111.1	114.1	117.2	120.3	123.6	126.9	130.3	133.8	137.5	141.2	145.0	2.7%
Building & construction	257.6	264.8	272.2	279.8	287.6	295.7	303.9	312.4	321.1	330.1	339.3	348.8	2.8%
Furniture & bedding	58.3	59.7	61.1	62.6	64.1	65.7	67.3	68.9	70.5	72.2	74.0	75.8	2.4%
Automotive	186.0	191.9	197.9	204.1	210.5	217.1	223.9	230.9	238.1	245.6	253.3	261.3	3.1%
Rail	46.1	47.8	49.6	51.4	53.4	55.3	57.4	59.6	61.8	64.1	66.5	69.0	3.7%
Wind	35.2	36.9	38.6	40.3	42.2	44.1	46.2	48.3	50.5	52.8	55.3	57.8	4.6%
Marine	38.3	39.2	40.1	41.0	41.9	42.8	43.8	44.8	45.8	46.9	47.9	49.0	2.3%
Others	16.8	17.1	17.3	17.6	17.8	18.0	18.2	18.4	18.5	18.6	18.6	18.7	0.7%
Total	746.5	768.3	790.8	814.0	837.8	862.3	887.6	913.6	940.3	967.8	996.2	1,025.3	2.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Polymer foam accounted for the maximum share in terms of demand in building & construction and automotive applications in 2017. In the same year, polymer foam market recorded a volume of USD 204.1 kilotons in automotive applications. The demand is anticipated to reach 261.3 kilotons by 2025, ascending at a CAGR of 3.1% over the forecast period.

Table 80 France polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	434.4	451.5	469.3	487.8	507.1	527.2	548.2	570.0	592.8	616.5	641.2	667.0	4.0%
Building & construction	1,083.5	1,130.5	1,179.7	1,231.1	1,284.8	1,341.0	1,399.8	1,461.2	1,525.6	1,592.8	1,663.3	1,737.0	4.4%
Furniture & bedding	261.8	270.1	278.6	287.5	296.6	306.1	315.9	326.0	336.5	347.3	358.6	370.2	3.2%
Automotive	827.9	864.9	903.7	944.2	986.7	1,031.2	1,077.7	1,126.5	1,177.5	1,231.0	1,287.1	1,345.8	4.5%
Rail	230.1	238.7	247.6	256.9	266.5	276.5	287.0	297.8	309.1	320.8	333.0	345.8	3.8%
Wind	120.3	128.2	136.6	145.6	155.2	165.4	176.4	188.1	200.5	213.8	228.1	243.3	6.6%
Marine	155.9	159.9	164.0	168.3	172.6	177.1	181.8	186.5	191.4	196.5	201.7	207.0	2.6%
Others	154.6	158.2	161.7	165.0	168.2	171.2	174.0	176.6	178.8	180.8	182.4	183.6	1.3%
Total	3,268.4	3,401.9	3,541.1	3,686.3	3,837.8	3,995.8	4,160.6	4,332.7	4,512.2	4,699.7	4,895.3	5,099.7	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polymer foam manufacturers are expected to witness significant growth in the building & construction segment, as more than 28 million housing units in France are 40 years old and has higher energy consumption as compared to transport and agriculture industries. As per the Energy Transition Act, the French government aims to reduce energy consumption in the buildings industry by improving energy efficiency in the old buildings. According to the Energy Transition Act, renovation and improving energy efficiency in existing buildings will be mandatory before 2030. This is expected to drive the demand for polyurethane foam in the coming years.

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6.3.6 Italy

6.3.6.1 Italy polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 81 Italy polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	569.5	583.4	597.7	612.3	627.3	642.6	658.3	674.4	690.8	707.7	725.0	742.7	2.4%
Revenue (USD Million)	2,631.2	2,761.9	2,899.2	3,043.8	3,195.9	3,355.9	3,524.4	3,701.8	3,888.5	4,085.1	4,292.1	4,510.2	5.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In terms of volume, the demand for polymer foam in Italy was 612.3 kilotons in 2017 and is projected to reach 742.7 kilotons by 2025, growing at a CAGR of 2.4% over the forecast period. The Italy polymer foam market recorded a revenue of USD 3,043.8 million in 2017 and is projected to reach USD 4,510.2 million by 2025, ascending at a CAGR of 5.0% over the forecast period. The demand for polymer foam in Italy is expected to be driven by the growth in the automotive market and robust wind energy capacity addition proposals by the government of Italy.

6.3.6.2 Italy polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 82 Italy polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Polyurethane Foam	139.5	142.2	144.9	147.7	150.6	153.5	156.5	159.5	162.6	165.8	169.0	172.2	1.9%
Polystyrene Foam	135.6	137.2	138.7	140.3	142.0	143.6	145.3	146.9	148.6	150.3	152.1	153.8	1.2%
PVC Foam	81.3	83.2	85.2	87.2	89.2	91.3	93.4	95.6	97.8	100.1	102.4	104.8	2.3%
Phenolic Foam	68.0	69.9	71.9	73.9	76.0	78.1	80.3	82.5	84.8	87.2	89.7	92.2	2.8%
Polyolefin Foam	79.1	82.1	85.3	88.6	92.0	95.6	99.3	103.2	107.2	111.3	115.6	120.1	3.9%
Melamine Foam	42.5	43.7	45.0	46.4	47.8	49.2	50.6	52.1	53.7	55.3	56.9	58.6	3.0%
Others	23.6	25.1	26.6	28.2	29.8	31.3	32.9	34.5	36.1	37.8	39.4	41.0	4.8%
Total	569.5	583.4	597.7	612.3	627.3	642.6	658.3	674.4	690.8	707.7	725.0	742.7	2.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the Italian Automatic Packaging Machinery Manufacturers' Association, the packaging industry in Italy is growing with increase in demand from European and Central & South American countries. The demand from Middle East & African countries is increasing which is anticipated to drive the demand for polyolefin foams over the forecast period.

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Table 83 Italy polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	668.2	694.6	722.0	750.5	780.2	811.0	843.0	876.3	910.9	946.8	984.2	1,023.1	3.9%
Polystyrene Foam	776.6	805.4	835.2	866.2	898.2	931.5	966.0	1,001.8	1,038.9	1,077.3	1,117.2	1,158.6	3.7%
PVC Foam	217.4	230.3	243.9	258.3	273.6	289.7	306.8	325.0	344.2	364.5	386.0	408.8	5.9%
Phenolic Foam	301.2	324.2	348.9	375.6	404.2	435.1	468.3	504.1	542.6	584.0	628.6	676.6	7.6%
Polyolefin Foam	347.6	371.4	396.8	424.0	453.0	484.0	517.1	552.5	590.3	630.7	673.8	719.9	6.8%
Melamine Foam	185.5	196.0	207.1	218.7	231.1	244.1	257.9	272.5	287.9	304.1	321.3	339.4	5.6%
Others	134.6	140.0	145.3	150.5	155.6	160.5	165.2	169.7	173.9	177.6	181.0	183.8	2.5%
Total	2,631.2	2,761.9	2,899.2	3,043.8	3,195.9	3,355.9	3,524.4	3,701.8	3,888.5	4,085.1	4,292.1	4,510.2	5.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Key application sectors for polymer foam in Italy are furniture & bedding and automotive. Several automobile manufacturers including Ducati, Ferrari and Maserati are imparting polymer foam in order to reduce the overall cost of the vehicle in the market and make them environmentally friendly.

6.3.6.3 Italy polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 84 Italy polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	70.2	72.4	74.7	77.0	79.4	81.9	84.4	87.1	89.8	92.6	95.5	98.5	3.1%
Building & construction	172.5	176.9	181.3	185.9	190.6	195.4	200.3	205.4	210.6	215.9	221.3	226.9	2.5%
Furniture & bedding	55.6	56.7	57.8	59.0	60.2	61.4	62.6	63.9	65.1	66.5	67.8	69.1	2.0%
Automotive	144.8	149.0	153.2	157.6	162.1	166.8	171.5	176.4	181.5	186.7	192.0	197.5	2.9%
Rail	38.2	38.8	39.3	39.9	40.5	41.1	41.7	42.3	42.9	43.6	44.2	44.9	1.5%
Wind	26.6	27.6	28.7	29.8	30.9	32.1	33.3	34.6	35.9	37.3	38.7	40.2	3.8%
Marine	29.2	29.4	29.6	29.9	30.1	30.4	30.6	30.9	31.1	31.4	31.6	31.9	0.8%
Others	32.4	32.7	33.0	33.2	33.4	33.6	33.7	33.8	33.9	33.9	33.9	33.8	0.2%
Total	569.5	583.4	597.7	612.3	627.3	642.6	658.3	674.4	690.8	707.7	725.0	742.7	2.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in automotive segment was estimated as the second largest segment in 2017, which accounted for a market share of 25.74% (in terms of volume). It is estimated to reach 26.59% by 2025 growing at a CAGR of 2.9% over the forecast period.

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Table 85 Italy polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	346.3	364.5	383.8	404.1	425.5	448.1	472.0	497.2	523.8	551.9	581.6	612.9	5.3%
Building & construction	822.0	862.4	904.9	949.5	996.5	1,046.0	1,097.9	1,152.7	1,210.2	1,270.8	1,334.6	1,401.8	5.0%
Furniture & bedding	234.4	242.8	251.4	260.3	269.7	279.3	289.4	299.8	310.7	322.0	333.7	345.9	3.6%
Automotive	622.8	654.3	687.4	722.2	758.9	797.5	838.3	881.1	926.3	974.0	1,024.1	1,077.0	5.1%
Rail	205.5	214.8	224.4	234.6	245.2	256.4	268.1	280.3	293.2	306.6	320.7	335.6	4.6%
Wind	118.9	127.9	137.6	148.0	159.2	171.3	184.4	198.4	213.6	229.9	247.6	266.6	7.6%
Marine	134.5	142.0	150.0	158.5	167.5	177.0	187.1	197.8	209.1	221.0	233.7	247.2	5.7%
Others	146.8	153.2	159.8	166.5	173.3	180.2	187.3	194.4	201.6	208.8	216.0	223.3	3.7%
Total	2,631.2	2,761.9	2,899.2	3,043.8	3,195.9	3,355.9	3,524.4	3,701.8	3,888.5	4,085.1	4,292.1	4,510.2	5.0%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Italy is the fourth largest automotive manufacturing market in Europe. According to the U.S. International Trade administration, the 1.82 million passenger vehicles were sold in 2016, an increase of 16% when compared to that of 2015. In 2016, the alternative automotive vehicle market in Europe attributed a considerable portion of the Italian automotive market, which represented 10.2% of the total vehicles sold in Italy. The share of the alternate vehicles manufacturing is expected to increase on account of the government policies towards manufacturing of energy efficient vehicles.

6.3.7 UK

6.3.7.1 UK polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 86 UK polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	791.6	824.0	857.8	893.0	929.6	967.7	1,007.4	1,048.7	1,091.7	1,136.4	1,183.0	1,231.6	4.1%
Revenue (USD Million)	3,223.5	3,369.1	3,521.7	3,681.8	3,849.8	4,026.2	4,211.3	4,405.7	4,609.9	4,824.5	5,050.0	5,287.2	4.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in UK is expected to be driven by the UK government target to improve energy efficiency in building & construction industry. On account of this, the number of firms in the UK construction sector reached 449,775 increasing at a rate of 7.3% during the period 2010-2016. With an aim to improve energy efficiency in construction sector, the UK government allocated USD 30 billion for the construction sector for the period 2017-2022.

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6.3.7.2 UK polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 87 UK polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	205.3	211.6	218.0	224.7	231.5	238.6	245.8	253.3	261.0	269.0	277.2	285.6	3.0%
Polystyrene Foam	177.4	183.4	189.7	196.2	202.9	209.8	217.0	224.4	232.1	240.0	248.2	256.7	3.4%
PVC Foam	120.8	125.8	131.1	136.6	142.3	148.2	154.4	160.8	167.5	174.5	181.8	189.4	4.2%
Phenolic Foam	81.8	85.5	89.3	93.4	97.6	102.0	106.7	111.5	116.6	121.8	127.4	133.1	4.5%
Polyolefin Foam	117.5	124.8	132.5	140.7	149.3	158.5	168.3	178.7	189.7	201.4	213.8	227.0	6.2%
Melamine Foam	53.2	55.7	58.4	61.2	64.2	67.3	70.5	73.9	77.4	81.2	85.1	89.2	4.8%
Others	35.5	37.1	38.7	40.3	41.8	43.3	44.7	46.1	47.4	48.6	49.7	50.6	2.9%
Total	791.6	824.0	857.8	893.0	929.6	967.7	1,007.4	1,048.7	1,091.7	1,136.4	1,183.0	1,231.6	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyolefin foam was 140.7 kilotons in 2017 and is projected to reach 227.0 kilotons by 2025, ascending at a CAGR of 6.2% over the forecast period. The demand for polyolefin foam was particularly driven by the growth of the packaging industry. The UK is the third largest exporter of processed food products in Europe. The presence of a number of small and medium-sized food enterprises is expected to provide abundant opportunities for the growth of polyolefin foam segment, which is used for a variety of food packaging purposes.

Table 88 UK polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	777.3	800.8	825.1	850.1	875.8	902.3	929.6	957.7	986.7	1,016.6	1,047.4	1,079.1	3.0%
Polystyrene Foam	1,033.5	1,068.9	1,105.6	1,143.4	1,182.6	1,223.1	1,265.0	1,308.3	1,353.1	1,399.4	1,447.4	1,497.0	3.4%
PVC Foam	290.9	304.8	319.4	334.7	350.7	367.5	385.2	403.6	423.0	443.2	464.5	486.7	4.8%
Phenolic Foam	303.0	318.7	335.2	352.6	370.9	390.1	410.3	431.6	453.9	477.5	502.2	528.2	5.2%
Polyolefin Foam	432.5	468.7	508.0	550.5	596.6	646.5	700.6	759.3	822.8	891.7	966.3	1,047.2	8.4%
Melamine Foam	194.4	205.8	218.0	230.9	244.5	259.0	274.3	290.5	307.7	325.9	345.1	365.5	5.9%
Others	191.9	201.2	210.5	219.6	228.7	237.6	246.3	254.7	262.7	270.2	277.1	283.5	3.2%
Total	3,223.5	3,369.1	3,521.7	3,681.8	3,849.8	4,026.2	4,211.3	4,405.7	4,609.9	4,824.5	5,050.0	5,287.2	4.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Polystyrene foam is expected to witness a significant growth in the coming years with the UK railways' preference for polystyrene foam blocks in the construction of modular platform systems. Polystyrene foam blocks accelerate the platform system construction process and account for a lower cost than conventional materials. The demand for polystyrene foams is projected to witness growth with increasing number of railway infrastructure development companies opting to use the foam in their platform systems.

6.3.7.3 UK polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 89 UK polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	114.9	120.3	126.0	132.0	138.3	144.9	151.8	159.0	166.6	174.5	182.8	191.5	4.8%
Building & construction	252.3	262.7	273.6	284.8	296.6	308.8	321.5	334.7	348.5	362.9	377.8	393.4	4.1%
Furniture & bedding	70.5	72.9	75.3	77.8	80.4	83.1	85.9	88.8	91.7	94.8	98.0	101.2	3.3%
Automotive	160.2	167.0	174.0	181.3	188.9	196.9	205.2	213.8	222.8	232.2	241.9	252.1	4.2%
Rail	62.4	64.6	66.8	69.2	71.6	74.2	76.8	79.5	82.3	85.2	88.2	91.3	3.5%
Wind	40.9	43.2	45.6	48.2	50.9	53.7	56.7	59.9	63.2	66.7	70.5	74.4	5.6%
Marine	49.5	51.4	53.4	55.5	57.6	59.9	62.2	64.6	67.1	69.7	72.4	75.2	3.9%
Others	40.8	41.9	43.0	44.1	45.2	46.3	47.4	48.5	49.5	50.5	51.5	52.5	2.2%
Total	791.6	824.0	857.8	893.0	929.6	967.7	1,007.4	1,048.7	1,091.7	1,136.4	1,183.0	1,231.6	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polymer foam is expected to witness significant demand in automotive applications on account of the steady and healthy growth of the UK automotive industry. According to Society of Motor Manufacturers and Traders (SMMT), the commercial vehicle manufacturing in the UK increased from 70,869 units in 2014 to 78,219 units in 2017. The presence of global automotive manufacturers such as JAGUAR LAND ROVER LIMITED, BMW AG, Toyota Motor Corporation made UK one of the automotive hub and an attractive location for investments in the industry. This factor is expected to provide lucrative growth opportunities to polymer foam manufacturers in the UK.

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Table 90 UK polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	438.7	461.7	486.0	511.6	538.7	567.3	597.5	629.5	663.2	698.9	736.7	776.7	5.4%
Building & construction	1,088.3	1,132.8	1,179.3	1,228.0	1,278.8	1,332.0	1,387.6	1,445.8	1,506.7	1,570.5	1,637.3	1,707.2	4.2%
Furniture & bedding	263.4	274.3	285.7	297.6	310.1	323.2	336.9	351.2	366.2	381.9	398.3	415.6	4.3%
Automotive	671.5	702.4	735.0	769.1	805.0	842.7	882.2	923.9	967.6	1,013.6	1,062.0	1,112.9	4.7%
Rail	230.8	241.0	251.7	262.9	274.7	287.0	299.9	313.5	327.7	342.7	358.4	374.9	4.5%
Wind	216.6	229.9	244.1	259.2	275.3	292.4	310.6	330.0	350.7	372.8	396.3	421.4	6.3%
Marine	168.9	178.2	188.1	198.5	209.6	221.3	233.7	246.8	260.7	275.5	291.1	307.7	5.6%
Others	145.4	148.6	151.8	154.8	157.6	160.3	162.8	165.0	167.0	168.6	169.9	170.8	1.2%
Total	3,223.5	3,369.1	3,521.7	3,681.8	3,849.8	4,026.2	4,211.3	4,405.7	4,609.9	4,824.5	5,050.0	5,287.2	4.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The UK Government, as a part of its Clean Growth Strategy, aims to increase its offshore wind installation capacity from 7 GW in 2017 to 30 GW by 2030. In its approach to increase the offshore wind generation, in 2018, the government allocated USD 711 million as a financial aid to support renewable projects in the UK. The continuous investment proposals by the UK government to support renewable projects in the UK are expected to drive the demand for polymer foam.

6.3.8 Spain

6.3.8.1 Spain polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 91 Spain polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	488.6	507.1	526.3	546.2	566.9	588.3	610.6	633.7	657.7	682.6	708.5	735.3	3.8%
Revenue (USD Million)	2,518.8	2,653.2	2,795.2	2,945.0	3,103.3	3,270.5	3,447.2	3,634.0	3,831.4	4,040.1	4,260.8	4,494.3	5.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In terms of volume, the demand for polymer foam in Spain was 546.2 kilotons in 2017 and is projected to reach 735.3 kilotons by 2025, growing at a CAGR of 3.8% over the forecast period. The Spain polymer foam market recorded a revenue of USD 2,945.0 million in 2017 and is projected to reach USD 4,494.3 million by 2025, ascending at a CAGR of 5.4% over the forecast period. In 2017, Spain accounted for 10.20% (in terms of revenue) of the polymer foam demand in Europe and its share is expected to marginally increase, to reach 11.48% by 2025.

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6.3.8.2 Spain polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 92 Spain polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	127.9	132.0	136.2	140.5	145.0	149.6	154.4	159.3	164.3	169.6	175.0	180.5	3.2%
Polystyrene Foam	117.5	120.7	124.1	127.5	131.0	134.6	138.3	142.1	146.0	150.0	154.1	158.4	2.8%
PVC Foam	65.1	68.0	71.0	74.2	77.5	81.0	84.6	88.4	92.3	96.4	100.7	105.2	4.5%
Phenolic Foam	49.7	51.9	54.1	56.5	58.9	61.4	64.1	66.9	69.8	72.8	75.9	79.2	4.3%
Polyolefin Foam	58.8	62.1	65.7	69.5	73.4	77.6	82.1	86.8	91.7	97.0	102.5	108.4	5.7%
Melamine Foam	38.5	40.2	42.1	44.1	46.2	48.3	50.6	52.9	55.4	58.0	60.7	63.5	4.7%
Others	31.1	32.1	33.1	34.0	34.9	35.8	36.7	37.5	38.2	38.9	39.5	40.1	2.1%
Total	488.6	507.1	526.3	546.2	566.9	588.3	610.6	633.7	657.7	682.6	708.5	735.3	3.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyurethane foam demand in Europe was 140.5 kilotons in 2017 and is anticipated to reach 180.5 kilotons by 2025, advancing at a CAGR of 3.2% over the forecast period. Spain polymer foam market is expected to experience a significant growth rate on account of rising infrastructure and industries which include automotive and packaging. Polymer foam will remain a key product for the various industries and applications owing to its superior characteristics as compared to other substitutes.

Table 93 Spain polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	613.0	641.0	670.3	701.0	733.0	766.5	801.5	838.2	876.5	916.5	958.4	1,002.2	4.6%
Polystyrene Foam	866.7	903.4	941.5	981.3	1,022.7	1,065.9	1,111.0	1,157.9	1,206.8	1,257.8	1,310.9	1,366.3	4.2%
PVC Foam	198.4	212.1	226.7	242.3	259.0	276.9	296.0	316.4	338.2	361.5	386.4	413.1	6.9%
Phenolic Foam	233.4	248.6	264.9	282.3	300.8	320.5	341.5	363.9	387.8	413.2	440.3	469.1	6.6%
Polyolefin Foam	273.8	296.2	320.4	346.6	374.9	405.6	438.7	474.6	513.4	555.3	600.7	649.8	8.2%
Melamine Foam	177.9	190.8	204.7	219.6	235.6	252.8	271.2	291.0	312.2	334.9	359.3	385.5	7.3%
Others	155.6	161.1	166.6	171.9	177.2	182.3	187.3	192.1	196.7	200.9	204.8	208.4	2.4%
Total	2,518.8	2,653.2	2,795.2	2,945.0	3,103.3	3,270.5	3,447.2	3,634.0	3,831.4	4,040.1	4,260.8	4,494.3	5.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Polyurethane foam as insulation as a sound proofing material can dampen the sound transmission and can provide thermal resistance. In 2018, as per the European Commission, European Investment Bank under the European Fund for Strategic Investments allocated USD 40 million to 524 affordable and low energy consuming housing units in Navarra, Spain. Such investments in the construction of Nearly Zero Energy Buildings is expected to trigger the demand for polyurethane foam in the coming years.

6.3.8.3 Spain polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 94 Spain polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	54.9	57.1	59.3	61.6	64.0	66.5	69.0	71.7	74.5	77.4	80.4	83.5	3.9%
Building & construction	168.2	174.3	180.6	187.1	193.9	201.0	208.3	215.8	223.7	231.8	240.2	248.9	3.6%
Furniture & bedding	35.4	36.3	37.2	38.1	39.0	40.0	40.9	41.9	43.0	44.0	45.1	46.2	2.4%
Automotive	121.2	126.0	131.0	136.2	141.6	147.2	153.1	159.1	165.4	172.0	178.8	185.9	4.0%
Rail	40.2	41.8	43.5	45.3	47.1	49.0	51.0	53.1	55.2	57.5	59.8	62.2	4.1%
Wind	22.0	23.5	25.2	26.9	28.7	30.7	32.8	35.1	37.5	40.0	42.8	45.7	6.9%
Marine	26.5	27.3	28.2	29.1	30.0	30.9	31.8	32.8	33.8	34.9	36.0	37.1	3.1%
Others	20.1	20.8	21.4	22.0	22.6	23.1	23.7	24.2	24.7	25.1	25.5	25.8	2.0%
Total	488.6	507.1	526.3	546.2	566.9	588.3	610.6	633.7	657.7	682.6	708.5	735.3	3.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the Confederation of Housing and Renewal Cooperatives of Spain, as of 2017, energy efficiency measures were taken up in over 14,006 homes as part of the refurbishment. At the same time more than 6,000 new residential buildings are under construction which is expected to augment the demand for polymer foam in building & construction segment.

According to Global Wind Energy Council, As of 2017, the 23.12 GW of wind energy capacity was installed in Spain, the fifth largest count in terms of wind energy installations across the globe. The contribution of wind energy to the total renewable energy capacity in Spain is expected to increase thereby driving the demand for polymer foam over the forecast period.

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Table 95 Spain polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	314.3	333.5	353.9	375.7	398.7	423.3	449.4	477.2	506.8	538.3	571.9	607.6	6.2%
Building & construction	888.9	928.9	970.8	1,014.8	1,060.8	1,109.1	1,159.8	1,212.9	1,268.6	1,327.1	1,388.5	1,453.0	4.6%
Furniture & bedding	204.0	213.1	222.6	232.5	242.9	253.8	265.2	277.2	289.7	302.9	316.7	331.2	4.5%
Automotive	612.8	647.8	684.8	724.0	765.5	809.6	856.2	905.7	958.2	1,013.9	1,073.0	1,135.7	5.8%
Rail	180.8	194.1	208.4	223.8	240.3	258.1	277.2	297.8	320.0	343.9	369.6	397.3	7.4%
Wind	81.9	89.7	98.3	107.8	118.1	129.5	142.0	155.7	170.8	187.4	205.6	225.6	9.7%
Marine	128.7	134.1	139.8	145.7	151.9	158.4	165.1	172.2	179.6	187.4	195.5	204.0	4.3%
Others	107.3	112.0	116.5	120.9	125.0	128.8	132.2	135.1	137.5	139.1	139.9	139.8	1.8%
Total	2,518.8	2,653.2	2,795.2	2,945.0	3,103.3	3,270.5	3,447.2	3,634.0	3,831.4	4,040.1	4,260.8	4,494.3	5.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

As of 2017, Spain is the second largest automotive vehicles manufacturer in Europe. According to Spanish Association of Automobile Equipment and Parts Manufacturers, approximately USD 11.5 billion is invested in Spain in the last decade, at an average of USD 2 billion per year. The steady increase in the automotive sector investments in Spain had resulted in high demand for polymer foam since 2014. The same trend is expected to continue thereby driving the demand for polymer foam over the forecast period.

6.3.9 Russia

6.3.9.1 Russia polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 96 Russia polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	902.6	934.9	968.4	1,003.1	1,039.0	1,076.2	1,114.8	1,154.7	1,196.1	1,239.0	1,283.3	1,329.3	3.6%
Revenue (USD Million)	3,907.9	4,057.9	4,213.7	4,375.6	4,543.8	4,718.5	4,900.0	5,088.6	5,284.6	5,488.4	5,700.2	5,920.5	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In terms of volume, the demand for polymer foam in Russia was 1,003.1 kilotons in 2017 and is projected to reach 1,329.3 kilotons by 2025, growing at a CAGR of 3.6% over the forecast period. The Russia polymer foam market recorded a revenue of USD 4,375.6 million in 2017 and is projected to reach USD 5,920.5 million by 2025, ascending at a CAGR of 3.9% over the forecast period. In 2017, Russia accounted for 15.76% (in terms of volume) of the polymer foam demand in Europe and its share is expected to marginally increase, to reach 16.18% by 2025.

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6.3.9.2 Russia polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 97 Russia polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	245.0	251.9	259.1	266.5	274.1	282.0	290.0	298.3	306.8	315.5	324.5	333.8	2.9%
Polystyrene Foam	202.6	207.8	213.2	218.6	224.2	230.0	235.9	241.9	248.1	254.5	261.0	267.7	2.6%
PVC Foam	117.7	122.9	128.3	133.9	139.8	146.0	152.4	159.1	166.1	173.4	181.1	189.0	4.4%
Phenolic Foam	94.6	99.2	104.0	109.1	114.4	119.9	125.7	131.8	138.2	145.0	152.0	159.4	4.9%
Polyolefin Foam	102.8	107.6	112.6	117.8	123.2	128.9	134.9	141.2	147.7	154.6	161.7	169.2	4.6%
Melamine Foam	75.3	79.2	83.4	87.8	92.5	97.3	102.5	107.9	113.6	119.6	125.9	132.5	5.3%
Others	64.6	66.3	67.8	69.4	70.8	72.1	73.4	74.5	75.5	76.4	77.1	77.6	1.4%
Total	902.6	934.9	968.4	1,003.1	1,039.0	1,076.2	1,114.8	1,154.7	1,196.1	1,239.0	1,283.3	1,329.3	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polyurethane foam demand in Europe was 266.5 kilotons in 2017 and is anticipated to reach 333.8 kilotons by 2025, advancing at a CAGR of 2.9% over the forecast period. Flexible polyurethane foam recorded significant demand and the segment is driven by the steady growth in demand from automotive and furniture & bedding segments. Lack of substitutes to polyurethane foam in cushion seat and automotive interior manufacturing is expected to ensure a constant demand for polyurethane foam in the coming years.

Table 98 Russia polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	968.2	1,006.8	1,046.8	1,088.5	1,131.8	1,176.8	1,223.6	1,272.3	1,322.9	1,375.5	1,430.3	1,487.2	4.0%
Polystyrene Foam	1,240.1	1,276.8	1,314.5	1,353.3	1,393.3	1,434.5	1,476.9	1,520.5	1,565.4	1,611.7	1,659.3	1,708.3	3.0%
PVC Foam	295.9	312.3	329.5	347.7	367.0	387.3	408.7	431.3	455.1	480.3	506.8	534.8	5.5%
Phenolic Foam	366.0	385.5	405.9	427.5	450.2	474.2	499.4	525.9	553.8	583.3	614.3	646.9	5.3%
Polyolefin Foam	395.0	414.2	434.3	455.4	477.6	500.8	525.1	550.7	577.4	605.5	635.0	665.8	4.9%
Melamine Foam	287.2	301.8	317.3	333.5	350.6	368.5	387.3	407.1	427.9	449.8	472.8	497.0	5.1%
Others	355.4	360.6	365.4	369.6	373.3	376.5	379.0	380.8	382.0	382.3	381.8	380.4	0.4%
Total	3,907.9	4,057.9	4,213.7	4,375.6	4,543.8	4,718.5	4,900.0	5,088.6	5,284.6	5,488.4	5,700.2	5,920.5	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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In 2017, the demand for polystyrene foam was valued at USD 1,353.3 million in 2017 and is anticipated to reach USD 1,708.3 million by 2025, progressing at a CAGR of 3.0% over the forecast period. Russian Railways invested approximately USD 8 billion for the execution of various railway projects including Moscow-Kazan high-speed railway line, Trans-Siberian Mail Line modernization, and others. The investments to upgrade railway infrastructure are projected to continue to increase, thereby driving the demand for polystyrene foam in rail applications.

6.3.9.3 Russia polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 99 Russia polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	119.3	123.4	127.7	132.1	136.7	141.4	146.3	151.3	156.6	162.0	167.6	173.3	3.5%
Building & construction	335.2	348.2	361.6	375.6	390.1	405.2	420.8	437.1	453.9	471.5	489.7	508.6	3.9%
Furniture & bedding	68.1	69.6	71.2	72.8	74.5	76.2	77.9	79.7	81.5	83.4	85.3	87.2	2.3%
Automotive	188.8	196.5	204.4	212.7	221.3	230.3	239.6	249.3	259.4	269.9	280.8	292.2	4.0%
Rail	60.7	63.3	66.0	68.9	71.9	75.1	78.3	81.7	85.3	89.0	92.9	96.9	4.4%
Wind	29.3	30.9	32.5	34.2	36.0	38.0	40.0	42.1	44.3	46.6	49.1	51.7	5.3%
Marine	42.0	43.1	44.2	45.4	46.6	47.8	49.1	50.4	51.7	53.1	54.5	56.0	2.7%
Others	59.2	60.0	60.7	61.3	61.9	62.4	62.8	63.2	63.4	63.5	63.5	63.4	0.4%
Total	902.6	934.9	968.4	1,003.1	1,039.0	1,076.2	1,114.8	1,154.7	1,196.1	1,239.0	1,283.3	1,329.3	3.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to Association of European Businesses, the sales of passenger cars in Russia is experiencing a recovery in growth after the sales declined from 2,316 thousand units in 2014 to 1,308 thousand units in 2016. However, in 2017, the sales of passenger cars recovered and increased to 1,465 units. The growth is expected to continue over the forecast period driving the demand for polymer foam in automotive segment.

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Table 100 Russia polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	484.2	507.9	532.8	559.0	586.4	615.2	645.4	677.1	710.4	745.3	782.0	820.6	4.9%
Building & construction	1,520.6	1,572.4	1,626.1	1,681.6	1,739.0	1,798.4	1,859.9	1,923.5	1,989.4	2,057.5	2,128.1	2,201.2	3.4%
Furniture & bedding	279.4	289.9	300.8	312.1	323.9	336.1	348.7	361.9	375.5	389.7	404.5	419.8	3.8%
Automotive	792.5	826.2	861.2	897.8	936.0	975.8	1,017.3	1,060.6	1,105.7	1,152.9	1,202.0	1,253.4	4.3%
Rail	242.7	254.9	267.7	281.2	295.3	310.2	325.8	342.3	359.5	377.7	396.7	416.8	5.0%
Wind	139.9	147.3	155.2	163.4	172.1	181.2	190.9	201.0	211.8	223.0	234.9	247.5	5.3%
Marine	188.4	192.6	196.9	201.3	205.8	210.4	215.1	219.9	224.8	229.9	235.1	240.4	2.2%
Others	260.3	266.7	273.0	279.3	285.3	291.2	296.9	302.3	307.5	312.3	316.8	320.9	1.8%
Total	3,907.9	4,057.9	4,213.7	4,375.6	4,543.8	4,718.5	4,900.0	5,088.6	5,284.6	5,488.4	5,700.2	5,920.5	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polymer foam accounted for the maximum share in terms of demand in building & construction and automotive applications in 2017. The segments together accounted for a market share of over 60% of the total polymer foam demand in 2017. In the same year, polymer foam market recorded a revenue of USD 1,681.6 million in building & construction applications. The revenue is anticipated to reach USD 2,201.2 million by 2025, ascending at a CAGR of 3.4% over the forecast period.

6.4 Asia Pacific

6.4.1 Asia Pacific polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 101 Asia Pacific polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	8,348.0	8,654.6	8,972.6	9,302.2	9,643.9	9,998.2	10,365.5	10,746.3	11,141.1	11,550.3	11,974.7	12,414.6	3.7%
Revenue (USD Million)	36,379.2	37,974.7	39,642.8	41,387.1	43,211.4	45,119.8	47,116.6	49,206.2	51,393.4	53,683.4	56,081.4	58,593.2	4.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Asia Pacific polymer foam market witnessed the largest demand, accounting for over 39% (in terms of revenue) of the global demand. It is projected to continue its dominance and account for 40.64% of the global market by 2025, progressing at a CAGR of 4.4% over the forecast period. In Asia Pacific, China and India dominated polymer foam market in terms of demand, together accounting for over 45% of the market share in 2017. The increase in investments in building & construction, automotive, rail, and wind energy projects are expected to propel the market growth over the forecast period.

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6.4.2 Asia pacific polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 102 Asia Pacific polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	2,471.3	2,547.4	2,625.8	2,706.5	2,789.6	2,875.2	2,963.4	3,054.2	3,147.6	3,243.9	3,342.9	3,444.9	3.1%
Polystyrene Foam	1,997.9	2,050.7	2,105.0	2,160.8	2,218.2	2,277.1	2,337.6	2,399.7	2,463.6	2,529.3	2,596.7	2,666.0	2.7%
PVC Foam	1,224.4	1,276.8	1,331.5	1,388.5	1,448.0	1,510.1	1,574.8	1,642.3	1,712.8	1,786.2	1,862.9	1,942.8	4.3%
Phenolic Foam	791.6	830.1	870.5	912.9	957.4	1,004.0	1,053.0	1,104.4	1,158.4	1,215.0	1,274.4	1,336.8	4.9%
Polyolefin Foam	1,063.7	1,111.1	1,160.7	1,212.5	1,266.6	1,323.1	1,382.2	1,443.8	1,508.3	1,575.5	1,645.8	1,719.2	4.5%
Melamine Foam	526.4	555.0	585.3	617.2	651.0	686.7	724.4	764.3	806.4	851.0	898.1	947.9	5.5%
Others	272.8	283.5	293.8	303.7	313.2	322.0	330.1	337.5	344.0	349.5	353.8	356.8	2.0%
Total	8,348.0	8,654.6	8,972.6	9,302.2	9,643.9	9,998.2	10,365.5	10,746.3	11,141.1	11,550.3	11,974.7	12,414.6	3.7%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Growing industrialization coupled with increasing production in automobile interiors or parts and packaging industries in emerging economies such as India and China is expected to a key factor responsible for increasing demand for polymer foam. Increase in foreign direct investment in is expected to contribute towards rising investments in these sectors and will eventually be a major growth determining factor for polymer foam market.

Table 103 Asia Pacific polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	9,599.6	9,970.6	10,355.7	10,755.4	11,170.3	11,600.9	12,047.8	12,511.5	12,992.8	13,492.3	14,010.5	14,548.3	3.8%
Polystyrene Foam	12,823.7	13,253.5	13,697.8	14,157.1	14,632.0	15,122.9	15,630.4	16,155.1	16,697.6	17,258.4	17,838.3	18,437.8	3.4%
PVC Foam	3,045.3	3,220.7	3,406.5	3,603.5	3,812.3	4,033.7	4,268.4	4,517.2	4,781.1	5,061.0	5,357.9	5,672.8	5.8%
Phenolic Foam	3,079.0	3,266.0	3,464.9	3,676.6	3,901.9	4,141.7	4,396.9	4,668.7	4,958.2	5,266.5	5,594.9	5,944.9	6.2%
Polyolefin Foam	4,294.5	4,536.9	4,793.3	5,064.7	5,351.8	5,655.8	5,977.6	6,318.2	6,678.9	7,060.8	7,465.2	7,893.6	5.7%
Melamine Foam	2,141.1	2,283.2	2,434.8	2,596.6	2,769.2	2,953.4	3,149.9	3,359.6	3,583.4	3,822.2	4,077.0	4,348.9	6.7%
Others	1,396.0	1,443.9	1,489.7	1,533.2	1,573.9	1,611.5	1,645.6	1,675.8	1,701.5	1,722.3	1,737.6	1,746.9	1.6%
Total	36,379.2	37,974.7	39,642.8	41,387.1	43,211.4	45,119.8	47,116.6	49,206.2	51,393.4	53,683.4	56,081.4	58,593.2	4.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Growing demand for polymer foam is expected to result in growth in building and construction, automobile and packaging industries. Asia Pacific has also witnessed a significant rise in the number of patents filed for producing polymer foam based products over the past couple of years which will result in a positive outlook for polymer foam over the next few years.

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Asia Pacific is also one of the most attractive destinations for wind energy manufacturers on account of the ambitious wind energy capacity addition targets set by various governments in Asia Pacific including China, India, Japan, and Taiwan. The wind energy capacity additions are expected to boost the demand for PVC foam in the coming years. PVC foam segment was valued at USD 3,603.5 million in 2017 and is anticipated to reach USD 5,672.8 million by 2025, advancing at a CAGR of 5.8% over the forecast period.

6.4.3 Asia Pacific polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 104 Asia Pacific polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	900.7	929.8	959.7	990.5	1,022.4	1,055.1	1,089.0	1,123.8	1,159.7	1,196.8	1,234.9	1,274.3	3.2%
Building & construction	3,309.5	3,430.1	3,555.1	3,684.7	3,819.1	3,958.4	4,102.8	4,252.6	4,408.0	4,569.1	4,736.1	4,909.4	3.7%
Furniture & bedding	685.4	704.4	723.9	744.0	764.6	785.8	807.6	830.0	853.0	876.6	900.9	925.9	2.8%
Automotive	1,828.1	1,899.6	1,973.9	2,051.1	2,131.4	2,214.9	2,301.6	2,391.9	2,485.7	2,583.2	2,684.6	2,790.1	3.9%
Rail	596.1	623.0	651.2	680.7	711.5	743.8	777.6	813.1	850.1	888.9	929.6	972.1	4.6%
Wind	334.6	355.3	377.4	401.0	426.1	452.8	481.3	511.6	543.9	578.3	615.0	654.1	6.3%
Marine	345.5	355.9	366.7	377.9	389.5	401.5	413.9	426.8	440.1	453.8	468.1	482.9	3.1%
Others	348.0	356.5	364.6	372.2	379.4	385.8	391.6	396.6	400.6	403.6	405.4	405.8	1.1%
Total	8,348.0	8,654.6	8,972.6	9,302.2	9,643.9	9,998.2	10,365.5	10,746.3	11,141.1	11,550.3	11,974.7	12,414.6	3.7%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in automotive application is expected to ascend at one of the highest CAGR of 3.9% over the forecast period. The demand for polymer foam in automotive applications was 2,051.1 kilotons in 2017 and is anticipated to reach 2,790.1 kilotons by 2025.

Growing demand from packaging, building and construction, furniture and bedding, and automotive are expected to be critical driving factor for polymer foam based products over the forecast period. Automotive industry is expected to remain the fastest growing segment over the forecast period owing to their high demand from various applications.

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Table 105 Asia Pacific polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	3,975.5	4,152.9	4,338.5	4,532.7	4,735.9	4,948.7	5,171.6	5,405.0	5,649.5	5,905.6	6,174.1	6,455.6	4.5%
Building & construction	13,975.8	14,583.3	15,218.3	15,882.3	16,576.7	17,303.1	18,063.1	18,858.4	19,691.0	20,562.6	21,475.5	22,431.7	4.4%
Furniture & bedding	2,931.4	3,033.8	3,140.1	3,250.4	3,365.0	3,483.9	3,607.3	3,735.6	3,868.9	4,007.5	4,151.5	4,301.3	3.6%
Automotive	8,413.1	8,821.7	9,251.1	9,702.5	10,177.2	10,676.5	11,201.9	11,754.7	12,336.7	12,949.5	13,595.0	14,275.0	4.9%
Rail	2,423.0	2,521.4	2,624.0	2,731.0	2,842.5	2,959.0	3,080.5	3,207.3	3,339.7	3,477.9	3,622.4	3,773.3	4.1%
Wind	1,547.1	1,656.8	1,774.4	1,900.5	2,035.6	2,180.5	2,335.8	2,502.2	2,680.8	2,872.2	3,077.5	3,297.6	7.1%
Marine	1,595.6	1,646.6	1,699.3	1,753.7	1,810.0	1,868.2	1,928.4	1,990.7	2,055.1	2,121.8	2,190.9	2,262.4	3.2%
Others	1,517.6	1,558.2	1,597.2	1,634.1	1,668.5	1,700.0	1,728.1	1,752.2	1,771.8	1,786.2	1,794.6	1,796.3	1.2%
Total	36,379.2	37,974.7	39,642.8	41,387.1	43,211.4	45,119.8	47,116.6	49,206.2	51,393.4	53,683.4	56,081.4	58,593.2	4.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Marine application segment was valued at USD 1,753.7 million in 2017 and is anticipated to reach USD 2,262.4 million by 2025, accelerating at a CAGR of 3.2% over the forecast period. The emergence of the Philippines, Indonesia, Singapore, Malaysia, China, and Vietnam as major shipbuilding centers in Asia Pacific region is expected to drive the demand for polymer foam in marine application.

6.4.4 China

6.4.4.1 China Polymer Foam Market Estimates And Forecasts, 2014–2025 (Kilotons) (USD Million)

Table 106 China polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	2,351.6	2,442.8	2,537.6	2,636.0	2,738.3	2,844.5	2,954.8	3,069.5	3,188.5	3,312.2	3,440.7	3,574.2	3.9%
Revenue (USD Million)	9,871.1	10,277.7	10,701.2	11,142.5	11,602.3	12,081.4	12,580.6	13,100.8	13,642.9	14,207.8	14,796.5	15,410.2	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

China is one of the largest markets for a wide variety of polymer foams on account of the robust investments in developing rail, automotive, construction, and wind energy infrastructures. It accounted for over 28% of the total demand for polymer foam in Asia Pacific. In terms of volume, the demand for polymer foam in China was 2,636.0 kilotons in 2017 and is projected to reach 3,574.2 kilotons by 2025, denoting a CAGR of 3.9% over the forecast period.

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6.4.4.2 China polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 107 China polymer foam market volume, by type, 2014–2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	659.4	681.5	704.3	727.9	752.3	777.5	803.6	830.5	858.3	887.1	916.8	947.5	3.4%
Polystyrene Foam	521.1	536.4	552.1	568.3	584.9	602.0	619.7	637.8	656.5	675.7	695.5	715.9	2.9%
PVC Foam	393.0	409.8	427.4	445.7	464.8	484.8	505.6	527.2	549.9	573.4	598.0	623.7	4.3%
Phenolic Foam	216.6	227.0	237.8	249.2	261.2	273.7	286.8	300.5	314.9	330.0	345.8	362.4	4.8%
Polyolefin Foam	334.4	349.8	365.8	382.6	400.2	418.5	437.8	457.9	478.9	500.9	523.9	547.9	4.6%
Melamine Foam	167.2	176.3	185.9	196.1	206.8	218.0	229.9	242.5	255.7	269.7	284.4	299.9	5.5%
Others	60.0	62.1	64.2	66.2	68.1	69.9	71.5	73.0	74.3	75.4	76.3	76.8	1.9%
Total	2,351.6	2,442.8	2,537.6	2,636.0	2,738.3	2,844.5	2,954.8	3,069.5	3,188.5	3,312.2	3,440.7	3,574.2	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the International Trade Administration, the construction sector value in China is expected to increase from USD 782 billion in 2017 to USD 1,042 billion by 2021. In 2014, the State Council Green Building Action Plan mandated various residential and non-residential buildings having area above 20,000 square meters to meet the national green building standards. This is expected to provide significant growth opportunities to polyurethane foam manufacturers in China.

Table 108 China polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	2,572.1	2,663.2	2,757.6	2,855.3	2,956.5	3,061.3	3,169.8	3,282.1	3,398.4	3,518.9	3,643.6	3,772.7	3.5%
Polystyrene Foam	3,028.6	3,130.1	3,235.1	3,343.6	3,455.8	3,571.7	3,691.5	3,815.3	3,943.2	4,075.5	4,212.2	4,353.5	3.4%
PVC Foam	1,085.9	1,132.6	1,181.3	1,232.0	1,285.0	1,340.2	1,397.9	1,458.0	1,520.6	1,586.0	1,654.2	1,725.3	4.3%
Phenolic Foam	867.8	911.2	956.7	1,004.5	1,054.7	1,107.4	1,162.8	1,220.9	1,282.0	1,346.0	1,413.3	1,484.0	5.0%
Polyolefin Foam	1,322.1	1,384.2	1,449.3	1,517.5	1,588.9	1,663.6	1,741.8	1,823.8	1,909.5	1,999.4	2,093.4	2,191.8	4.7%
Melamine Foam	718.9	768.9	822.4	879.6	940.8	1,006.2	1,076.2	1,151.1	1,231.2	1,316.8	1,408.4	1,506.4	7.0%
Others	275.8	287.4	298.8	309.9	320.6	330.9	340.6	349.6	357.9	365.2	371.5	376.5	2.5%
Total	9,871.1	10,277.7	10,701.2	11,142.5	11,602.3	12,081.4	12,580.6	13,100.8	13,642.9	14,207.8	14,796.5	15,410.2	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Improved standard of living and the people increasingly willing to invest in home decoration is resulting in the growth of furniture & bedding market in China. As per the National Bureau of Statistics, the total revenue of furniture market in China reached USD 132.5 billion in 2017, increasing by 10.1% as compared to that of 2016. As a result, the demand for flexible polyurethane foam is expected to increase over the forecast period.

6.4.4.3 China polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 109 China polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	241.7	249.7	257.8	266.3	275.0	284.0	293.3	302.9	312.8	323.1	333.6	344.5	3.3%
Building & construction	979.9	1,014.5	1,050.2	1,087.3	1,125.6	1,165.3	1,206.4	1,249.0	1,293.0	1,338.6	1,385.8	1,434.7	3.5%
Furniture & bedding	185.5	191.4	197.5	203.7	210.1	216.8	223.6	230.7	238.0	245.5	253.3	261.3	3.2%
Automotive	499.2	519.3	540.2	562.0	584.6	608.1	632.6	658.1	684.6	712.1	740.8	770.6	4.0%
Rail	174.7	184.3	194.4	205.0	216.3	228.1	240.6	253.8	267.7	282.4	297.9	314.2	5.5%
Wind	84.0	90.9	98.5	106.7	115.6	125.2	135.6	146.9	159.2	172.4	186.8	202.3	8.3%
Marine	73.8	77.2	80.7	84.4	88.2	92.2	96.4	100.8	105.4	110.2	115.2	120.4	4.5%
Others	112.6	115.5	118.2	120.6	122.8	124.7	126.2	127.3	127.9	128.0	127.4	126.2	0.6%
Total	2,351.6	2,442.8	2,537.6	2,636.0	2,738.3	2,844.5	2,954.8	3,069.5	3,188.5	3,312.2	3,440.7	3,574.2	3.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In 2017, China Railway Corporation announced that it will invest USD 112.4 billion in the development of high-speed rail network to connect major big cities in China. The company has already invested approximately USD 117 billion in 2016 for the same in China. These investments are a part of the China's targets to construct high-speed railway network line of 38,000 kilometers by 2025. Such investment plans are expected to bring in more rail traffic in the coming years, thereby providing lucrative opportunities for polymer foam manufacturers.

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Table 110 China polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	933.8	978.2	1,024.6	1,073.4	1,124.4	1,177.9	1,234.1	1,292.9	1,354.5	1,419.2	1,486.9	1,558.0	4.8%
Building & construction	3,976.1	4,131.3	4,292.8	4,460.6	4,635.2	4,816.6	5,005.4	5,201.7	5,405.8	5,618.1	5,838.9	6,068.5	3.9%
Furniture & bedding	801.5	823.7	846.5	869.9	894.0	918.8	944.3	970.5	997.5	1,025.3	1,053.9	1,083.3	2.8%
Automotive	2,318.7	2,426.4	2,539.2	2,657.3	2,780.9	2,910.4	3,046.0	3,188.0	3,336.7	3,492.4	3,655.5	3,826.3	4.7%
Rail	620.9	645.4	671.0	697.5	725.1	753.8	783.7	814.8	847.2	880.9	915.9	952.3	4.0%
Wind	456.0	488.2	522.6	559.5	599.0	641.3	686.6	735.1	787.0	842.7	902.3	966.2	7.1%
Marine	342.5	353.1	364.0	375.3	386.9	398.9	411.2	424.0	437.2	450.8	464.8	479.3	3.1%
Others	421.5	431.3	440.6	449.1	456.8	463.6	469.3	473.8	477.0	478.5	478.3	476.2	0.7%
Total	9,871.1	10,277.7	10,701.2	11,142.5	11,602.3	12,081.4	12,580.6	13,100.8	13,642.9	14,207.8	14,796.5	15,410.2	4.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to International Trade Administration, the sales of automotive vehicles in 2016 reached 28 million units, making it the largest automotive market in the world. The Chinese Central Government expects that the automobile output is expected to reach 35 million units by 2025. The steady growth in the automotive sector is expected to drive the demand for polymer foam in automotive segment.

6.4.5 India

6.4.5.1 India polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 111 India polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,415.0	1,478.2	1,544.2	1,613.1	1,685.2	1,760.4	1,839.0	1,921.2	2,007.0	2,096.6	2,190.2	2,288.0	4.5%
Revenue (USD Million)	6,112.9	6,410.5	6,722.9	7,050.6	7,394.6	7,755.7	8,134.9	8,533.0	8,951.2	9,390.4	9,852.0	10,337.1	4.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in India is driven by the rising preference for rigid polyurethane foam as an insulation material and a dampener for noise and vibration control in building & construction, automotive, rail, and marine applications. The demand is also augmented by the increase in wind energy capacity additions. In terms of volume, the demand for polymer foam was 1,613.1 kilotons in 2017 and is projected to reach 2,288.0 kilotons by 2025, registering a CAGR of 4.5% over the forecast period. In terms of revenue, the market was valued at USD 7,050.6 million in 2017 and is anticipated to reach USD 10,337.1 million by 2025, rising at a CAGR of 4.9% from 2017 and 2025.

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6.4.5.2 India polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 112 India polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	426.9	442.7	459.0	476.0	493.6	511.8	530.7	550.3	570.7	591.8	613.6	636.3	3.7%
Polystyrene Foam	344.3	355.7	367.6	379.8	392.4	405.5	419.0	432.9	447.4	462.2	477.6	493.5	3.3%
PVC Foam	205.3	216.3	227.9	240.1	252.9	266.4	280.7	295.7	311.5	328.2	345.8	364.3	5.4%
Phenolic Foam	153.9	162.9	172.5	182.5	193.2	204.5	216.4	229.0	242.4	256.5	271.5	287.4	5.8%
Polyolefin Foam	180.1	189.3	198.9	209.0	219.6	230.8	242.5	254.8	267.8	281.4	295.7	310.7	5.1%
Melamine Foam	58.2	62.7	67.6	72.9	78.6	84.7	91.4	98.5	106.2	114.5	123.5	133.2	7.8%
Others	46.3	48.6	50.8	52.9	54.9	56.7	58.3	59.8	61.0	61.9	62.5	62.7	2.2%
Total	1,415.0	1,478.2	1,544.2	1,613.1	1,685.2	1,760.4	1,839.0	1,921.2	2,007.0	2,096.6	2,190.2	2,288.0	4.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the Make in India Initiative, India is expected to be third largest construction market by 2030 and the market size of the construction industry in India is expected to reach USD 1 trillion by 2025. This provides robust growth opportunities to polymer foam manufacturers in India.

As per the Green Rating for Integrated Habitat Assessment, the green building market size in India is expected to grow from 4.5 billion sq.ft in 2016 to 10 billion sq.ft by 2022. As a result, polyurethane foam segment, in terms of demand, is expected to continue its dominance over the forecast period.

Table 113 India polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,807.2	1,876.1	1,947.6	2,021.9	2,098.9	2,178.9	2,262.0	2,348.2	2,437.7	2,530.6	2,627.1	2,727.2	3.8%
Polystyrene Foam	1,852.6	1,930.8	2,012.3	2,097.2	2,185.7	2,277.9	2,374.0	2,474.2	2,578.6	2,687.4	2,800.8	2,918.9	4.2%
PVC Foam	642.3	680.6	721.2	764.1	809.7	857.9	909.1	963.2	1,020.6	1,081.5	1,145.9	1,214.2	6.0%
Phenolic Foam	539.7	581.8	627.2	676.2	729.0	785.9	847.2	913.3	984.6	1,061.4	1,144.3	1,233.6	7.8%
Polyolefin Foam	772.9	813.7	856.6	901.8	949.3	999.4	1,052.1	1,107.6	1,166.1	1,227.6	1,292.3	1,360.5	5.3%
Melamine Foam	271.4	292.0	314.1	338.0	363.6	391.2	420.9	452.9	487.2	524.2	564.0	606.8	7.6%
Others	226.7	235.6	243.9	251.5	258.5	264.5	269.6	273.6	276.4	277.8	277.7	275.8	1.2%
Total	6,112.9	6,410.5	6,722.9	7,050.6	7,394.6	7,755.7	8,134.9	8,533.0	8,951.2	9,390.4	9,852.0	10,337.1	4.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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According to the Society of Indian Automobile Manufacturers, the production of passenger vehicles increased from 32,21,419 units in 2014 to 40,10,373 units in 2018. The significant growth in the automotive industry is expected to continue thus thriving the demand for polymer foam in automotive segment over the forecast period.

6.4.5.3 India polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 114 India polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	146.0	150.8	155.7	160.8	166.0	171.4	177.0	182.8	188.7	194.9	201.2	207.8	3.3%
Building & construction	555.8	581.1	607.5	635.1	664.0	694.2	725.8	758.8	793.3	829.4	867.1	906.5	4.5%
Furniture & bedding	116.2	119.9	123.7	127.7	131.8	136.0	140.3	144.8	149.5	154.2	159.2	164.3	3.2%
Automotive	286.8	300.6	315.0	330.1	345.9	362.5	379.8	398.0	417.1	437.1	458.1	480.0	4.8%
Rail	102.7	108.7	114.9	121.5	128.6	136.0	143.8	152.1	160.9	170.2	180.0	190.4	5.8%
Wind	88.3	93.8	99.6	105.8	112.4	119.4	126.8	134.7	143.0	151.9	161.3	171.4	6.2%
Marine	73.0	75.3	77.6	80.0	82.5	85.1	87.7	90.5	93.3	96.2	99.2	102.3	3.1%
Others	46.1	48.1	50.1	52.1	54.0	55.9	57.8	59.5	61.2	62.7	64.2	65.4	2.9%
Total	1,415.0	1,478.2	1,544.2	1,613.1	1,685.2	1,760.4	1,839.0	1,921.2	2,007.0	2,096.6	2,190.2	2,288.0	4.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In 2018, the MNRE announced offshore wind capacity addition of 5 GW by 2022 and 30 GW by 2030. One of the challenges faced to meet these capacity addition targets is the difficulty in installing large and heavier wind turbine blades in offshore areas. As a result, to offset the installation and maintenance problems caused due to large wind turbine blade, wind turbine manufacturers are increasingly preferring lightweight materials such as PVC foam, which significantly reduces the weight of the turbine blade. Thus, the demand for polymer foam in wind energy application is expected to significantly increase over the forecast period.

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Table 115 India polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	685.3	714.3	744.6	776.2	809.2	843.6	879.5	917.0	956.1	997.0	1,039.7	1,084.4	4.3%
Building & construction	2,286.2	2,397.0	2,513.3	2,635.2	2,763.2	2,897.5	3,038.4	3,186.5	3,341.9	3,505.1	3,676.6	3,856.8	4.9%
Furniture & bedding	438.9	459.1	480.2	502.4	525.5	549.8	575.2	601.8	629.6	658.8	689.4	721.5	4.6%
Automotive	1,301.4	1,373.6	1,449.7	1,530.1	1,615.1	1,704.8	1,799.6	1,899.8	2,005.6	2,117.5	2,235.9	2,361.0	5.6%
Rail	445.6	467.6	490.7	515.0	540.4	567.2	595.2	624.8	655.8	688.4	722.7	758.7	5.0%
Wind	410.8	436.6	464.1	493.3	524.3	557.4	592.5	629.9	669.8	712.1	757.2	805.3	6.3%
Marine	285.5	296.3	307.6	319.3	331.4	344.0	357.1	370.8	385.0	399.7	415.1	431.1	3.8%
Others	259.2	266.0	272.7	279.3	285.6	291.6	297.3	302.5	307.4	311.7	315.4	318.4	1.7%
Total	6,112.9	6,410.5	6,722.9	7,050.6	7,394.6	7,755.7	8,134.9	8,533.0	8,951.2	9,390.4	9,852.0	10,337.1	4.9%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyurethane foam is driven by the increase in the rail infrastructure spending by the Indian government. According to the Ministry of Railways of India, the government in 2018 proposed the conversion of 10,000 kilometers of trunk routes to high-speed corridors and upgrade of infrastructure. The proposed investment of approximately USD 300 billion in high-speed corridor projects by the Indian government is expected to propel the demand for polystyrene and polyurethane foam over the forecast period.

6.4.6 Japan

6.4.6.1 Japan polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 116 Japan polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,133.7	1,162.2	1,191.6	1,221.6	1,252.4	1,284.0	1,316.4	1,349.6	1,383.6	1,418.5	1,454.3	1,491.0	2.5%
Revenue (USD Million)	4,663.3	4,854.3	5,053.5	5,261.3	5,478.1	5,704.5	5,940.8	6,187.6	6,445.5	6,715.1	6,996.9	7,291.7	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in Japan was 1,221.6 kilotons in 2017 and is anticipated to reach 1,491.0 kilotons by 2025, progressing at a CAGR of 2.5% over the forecast period. Japan has an advantage of numerous industries in the automotive and packaging which can bring significant growth over the forecast period. However, the Japanese manufacturers also aim to increase their profit margins by increasing their exports and cater to the global needs by manufacturing quality polymer foam products.

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6.4.6.2 Japan polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 117 Japan polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	330.2	336.7	343.3	350.0	356.8	363.8	370.9	378.2	385.6	393.1	400.8	408.7	2.0%
Polystyrene Foam	285.2	289.0	292.9	296.8	300.8	304.8	308.9	313.0	317.2	321.5	325.7	330.1	1.3%
PVC Foam	153.8	158.8	163.9	169.2	174.6	180.2	186.0	192.0	198.2	204.6	211.2	218.0	3.2%
Phenolic Foam	116.7	121.3	126.0	131.0	136.2	141.6	147.2	153.0	159.0	165.3	171.8	178.6	3.9%
Polyolefin Foam	141.0	145.9	150.9	156.1	161.4	166.9	172.7	178.6	184.7	191.1	197.6	204.4	3.4%
Melamine Foam	76.2	78.9	81.7	84.6	87.6	90.8	94.0	97.3	100.8	104.4	108.1	112.0	3.6%
Others	30.5	31.7	32.8	33.9	34.9	35.8	36.7	37.4	38.0	38.6	39.0	39.2	1.8%
Total	1,133.7	1,162.2	1,191.6	1,221.6	1,252.4	1,284.0	1,316.4	1,349.6	1,383.6	1,418.5	1,454.3	1,491.0	2.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the Japan Automobile Manufacturers Association, the production of standard passenger cars increased from 4,657,765 units in 2014 to 5,147,256 units in 2017. Some of the well-established Japan based automotive manufacturers such as Hino Motors, Ltd, Honda Motor Co., Ltd, Isuzu Motors Limited are shifting their production strategies for the production of energy efficient vehicles. This shift in trend is anticipated to provide demand for polymer foam manufacturers in Japan.

Table 118 Japan polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,139.0	1,182.7	1,228.0	1,275.1	1,323.9	1,374.7	1,427.3	1,482.0	1,538.8	1,597.8	1,659.0	1,722.6	3.8%
Polystyrene Foam	1,862.6	1,915.8	1,970.4	2,026.6	2,084.4	2,143.9	2,205.0	2,268.0	2,332.6	2,399.2	2,467.6	2,538.0	2.9%
PVC Foam	301.7	322.9	345.5	369.8	395.8	423.6	453.4	485.2	519.3	555.8	594.8	636.6	7.0%
Phenolic Foam	410.1	433.9	459.2	485.9	514.2	544.1	575.7	609.2	644.6	682.1	721.8	763.8	5.8%
Polyolefin Foam	513.7	542.2	572.2	604.0	637.5	672.8	710.1	749.5	791.0	834.9	881.2	930.0	5.5%
Melamine Foam	268.5	284.7	301.9	320.2	339.6	360.2	382.0	405.1	429.6	455.6	483.2	512.5	6.1%
Others	167.7	172.2	176.2	179.7	182.8	185.3	187.3	188.7	189.5	189.7	189.3	188.2	0.6%
Total	4,663.3	4,854.3	5,053.5	5,261.3	5,478.1	5,704.5	5,940.8	6,187.6	6,445.5	6,715.1	6,996.9	7,291.7	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Polyurethane foam segment was estimated as the largest on account of the robust investment made in the construction sector in during the period 2014-2017. According to Research Institute Of Construction And Economy (RICE), the investment in the construction sector in 2016 was USD 472 billion and the investment slightly increased in 2017 and reached USD 478 billion in 2017. Construction sector in Japan, is one of the highly energy intensive industries in Japan and it is rapidly adopting energy conservation measures by mandating energy efficiency in buildings. This is expected to propel the demand for rigid polyurethane foam manufacturers.

6.4.6.3 Japan polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 119 Japan polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	128.0	131.3	134.7	138.2	141.8	145.4	149.2	153.1	157.0	161.1	165.2	169.5	2.6%
Building & construction	403.7	413.2	422.9	432.9	443.1	453.5	464.2	475.2	486.4	497.8	509.5	521.5	2.4%
Furniture & bedding	85.4	87.3	89.2	91.2	93.3	95.4	97.5	99.7	102.0	104.3	106.6	109.0	2.2%
Automotive	277.9	286.0	294.3	302.9	311.7	320.8	330.1	339.7	349.6	359.8	370.3	381.1	2.9%
Rail	89.4	92.3	95.3	98.3	101.4	104.7	108.0	111.5	115.0	118.7	122.5	126.4	3.2%
Wind	35.7	37.1	38.6	40.1	41.6	43.2	44.9	46.7	48.5	50.4	52.4	54.4	3.9%
Marine	52.9	53.7	54.5	55.4	56.2	57.0	57.9	58.7	59.6	60.5	61.4	62.3	1.5%
Others	60.7	61.4	62.0	62.7	63.3	63.9	64.5	65.0	65.5	65.9	66.3	66.6	0.8%
Total	1,133.7	1,162.2	1,191.6	1,221.6	1,252.4	1,284.0	1,316.4	1,349.6	1,383.6	1,418.5	1,454.3	1,491.0	2.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to the Japan Wind Power Association, Japan aims to increase its installed wind energy capacity from 4 GW in 2016 to 74 GW by 2050. Offshore wind power installations are expected to account for over 50% of the total wind energy capacity addition by 2050. This is expected to drive the demand for polymer foam in wind energy application in the coming years.

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Table 120 Japan polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	589.4	611.8	635.0	659.2	684.4	710.6	737.9	766.3	795.9	826.7	858.9	892.5	3.9%
Building & construction	1,594.4	1,659.6	1,727.5	1,798.4	1,872.4	1,949.6	2,030.2	2,114.4	2,202.3	2,294.2	2,390.3	2,490.8	4.2%
Furniture & bedding	388.5	402.1	416.3	431.1	446.4	462.3	478.8	495.9	513.8	532.3	551.6	571.7	3.6%
Automotive	1,197.1	1,249.2	1,303.6	1,360.5	1,420.1	1,482.4	1,547.5	1,615.8	1,687.3	1,762.1	1,840.6	1,922.8	4.4%
Rail	328.3	342.1	356.4	371.4	387.1	403.4	420.5	438.4	457.0	476.6	497.0	518.4	4.3%
Wind	163.7	176.0	189.2	203.5	218.8	235.4	253.2	272.4	293.1	315.4	339.4	365.3	7.6%
Marine	217.8	224.4	231.3	238.4	245.7	253.3	261.2	269.3	277.7	286.4	295.4	304.8	3.1%
Others	184.2	189.2	194.1	198.8	203.3	207.6	211.6	215.3	218.5	221.3	223.6	225.3	1.6%
Total	4,663.3	4,854.3	5,053.5	5,261.3	5,478.1	5,704.5	5,940.8	6,187.6	6,445.5	6,715.1	6,996.9	7,291.7	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

With an ageing population, the demand for polymer foam in Japan packaging industry is expected to increase on account of the old consumers looking for safe and lighter packaging material which can be easily opened and provides safety during transit. The demand for polymer foam in packaging segment was valued at USD 659.2 million in 2017 and is projected to reach USD 892.5 million by 2025 advancing at a CAGR of 3.9% over the forecast period.

6.4.7 South Korea

6.4.7.1 South Korea polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 121 South Korea polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	990.1	1,011.0	1,032.4	1,054.2	1,076.5	1,099.3	1,122.6	1,146.3	1,170.6	1,195.3	1,220.6	1,246.4	2.1%
Revenue (USD Million)	4,478.4	4,714.9	4,965.0	5,229.5	5,509.5	5,806.0	6,120.1	6,453.1	6,806.1	7,180.6	7,578.1	8,000.2	5.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in South Korea was driven by the growth in the residential construction, rail infrastructure and automotive markets. In 2016, the South Korean government allocated USD 43.2 billion to improve its railway infrastructure by 2020. The strong growth in the construction markets has also led to the increase in the demand for polymer foam since 2014. According to Bank of Korea, the construction sector registered a growth of 10.7% in 2017, driven by the increase in residential and non-residential construction activities.

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6.4.7.2 South Korea polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 122 South Korea polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	278.9	282.8	286.8	290.8	294.9	299.0	303.2	307.5	311.8	316.1	320.6	325.1	1.4%
Polystyrene Foam	243.7	246.1	248.5	251.0	253.5	256.0	258.5	261.1	263.7	266.3	268.9	271.6	1.0%
PVC Foam	135.5	139.2	142.9	146.7	150.7	154.7	158.9	163.1	167.5	172.0	176.6	181.4	2.7%
Phenolic Foam	102.8	106.1	109.6	113.2	116.9	120.8	124.7	128.8	133.1	137.4	141.9	146.6	3.3%
Polyolefin Foam	127.1	130.9	134.7	138.7	142.8	147.0	151.3	155.7	160.3	165.0	169.9	174.9	2.9%
Melamine Foam	77.4	80.4	83.6	86.8	90.2	93.7	97.4	101.2	105.1	109.2	113.5	117.9	3.9%
Others	24.7	25.5	26.3	27.0	27.6	28.1	28.6	28.9	29.1	29.2	29.2	29.0	0.9%
Total	990.1	1,011.0	1,032.4	1,054.2	1,076.5	1,099.3	1,122.6	1,146.3	1,170.6	1,195.3	1,220.6	1,246.4	2.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

In 2018, the South Korean government announced a five-year plan to increase the revenue of its marine sector to USD 48 billion by 2022. Initiatives such as creating investment fund and providing incentives for the shipbuilders are part of the five-year plan to boost the growth of its marine sector. This is expected to provide lucrative growth opportunities to polystyrene and polyurethane foam manufacturers in South Korea.

Table 123 South Korea polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,042.4	1,093.8	1,147.9	1,204.6	1,264.1	1,326.5	1,392.0	1,460.8	1,533.0	1,608.7	1,688.1	1,771.5	4.9%
Polystyrene Foam	1,777.2	1,839.3	1,903.6	1,970.2	2,039.0	2,110.3	2,184.1	2,260.5	2,339.5	2,421.3	2,505.9	2,593.5	3.5%
PVC Foam	304.3	327.4	352.2	379.0	407.7	438.6	471.9	507.7	546.2	587.7	632.3	680.2	7.6%
Phenolic Foam	424.4	458.5	495.3	535.1	578.0	624.4	674.6	728.7	787.2	850.4	918.7	992.4	8.0%
Polyolefin Foam	519.2	561.6	607.5	657.2	710.9	769.1	831.9	899.9	973.5	1,053.1	1,139.2	1,232.3	8.2%
Melamine Foam	268.0	287.0	307.4	329.3	352.7	377.8	404.6	433.4	464.2	497.3	532.6	570.5	7.1%
Others	143.0	147.2	151.0	154.3	157.0	159.3	161.0	162.0	162.5	162.3	161.4	159.7	0.4%
Total	4,478.4	4,714.9	4,965.0	5,229.5	5,509.5	5,806.0	6,120.1	6,453.1	6,806.1	7,180.6	7,578.1	8,000.2	5.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polystyrene foam in terms of revenue was estimated as the largest segment followed by polyurethane foam segment. The demand for polystyrene segment was valued at USD 1,970.2 million in 2017 and is projected to reach USD 2,593.5 million by 2025 progressing at a CAGR of 3.5% over the forecast period.

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6.4.7.3 South Korea polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 124 South Korea polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	101.9	103.9	106.0	108.1	110.3	112.5	114.8	117.1	119.4	121.8	124.3	126.8	2.0%
Building & construction	407.8	417.6	427.7	438.0	448.5	459.3	470.4	481.7	493.3	505.2	517.4	529.9	2.4%
Furniture & bedding	88.2	89.5	90.8	92.1	93.4	94.8	96.2	97.6	99.0	100.4	101.9	103.3	1.4%
Automotive	211.9	215.8	219.8	223.9	228.0	232.3	236.6	241.0	245.5	250.0	254.7	259.4	1.9%
Rail	77.4	79.1	80.7	82.4	84.1	85.9	87.7	89.6	91.5	93.4	95.3	97.3	2.1%
Wind	30.8	31.7	32.7	33.7	34.8	35.8	36.9	38.1	39.3	40.5	41.7	43.0	3.1%
Marine	44.7	45.5	46.3	47.2	48.0	48.9	49.8	50.7	51.7	52.6	53.6	54.6	1.8%
Others	27.4	27.9	28.4	28.8	29.3	29.7	30.1	30.6	31.0	31.4	31.8	32.2	1.4%
Total	990.1	1,011.0	1,032.4	1,054.2	1,076.5	1,099.3	1,122.6	1,146.3	1,170.6	1,195.3	1,220.6	1,246.4	2.1%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

According to The International Organization of Motor Vehicle Manufacturers, over 3.9 million units of passenger cars were manufactured in South Korea, making it the sixth largest automotive manufacturing industry in the world. The growth in the sales of fuel-cell electric vehicles, plug-in hybrid electric vehicles, hybrid electric vehicles, and electric vehicles is expected to drive the demand for polymer foam, which results in significantly reducing the weight of the automotive vehicle.

Table 125 South Korea polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	514.6	543.3	573.7	606.0	640.2	676.5	715.1	756.2	799.8	846.1	895.5	948.0	5.8%
Building & construction	1,800.8	1,897.0	1,998.8	2,106.5	2,220.6	2,341.5	2,469.6	2,605.4	2,749.6	2,902.6	3,065.1	3,237.7	5.5%
Furniture & bedding	324.2	337.0	350.3	364.2	378.8	394.0	410.0	426.8	444.3	462.8	482.1	502.4	4.1%
Automotive	1,055.1	1,117.8	1,184.5	1,255.4	1,331.0	1,411.4	1,497.1	1,588.5	1,685.9	1,789.8	1,900.8	2,019.2	6.1%
Rail	276.8	290.6	305.3	320.7	337.1	354.3	372.5	391.8	412.2	433.7	456.6	480.8	5.2%
Wind	139.3	150.2	162.0	174.8	188.6	203.6	219.8	237.4	256.5	277.2	299.6	324.0	8.0%
Marine	213.2	221.0	229.1	237.6	246.4	255.6	265.3	275.4	286.0	297.1	308.7	320.8	3.8%
Others	154.5	158.1	161.4	164.4	166.9	169.1	170.7	171.6	171.9	171.3	169.8	167.2	0.2%
Total	4,478.4	4,714.9	4,965.0	5,229.5	5,509.5	5,806.0	6,120.1	6,453.1	6,806.1	7,180.6	7,578.1	8,000.2	5.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Building & construction and rail segment witnessed significant growth owing to the increased spending on building & construction sector and rail infrastructure sector on account of the Winter Olympics in 2018. According to Global Infrastructure Hub, South Korea is expected to invest USD 1.4 trillion on infrastructure development by 2040. As a result, polymer foam manufacturers are expected to witness significant growth in the coming years.

6.4.8 Singapore

6.4.8.1 Singapore polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 126 Singapore polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	678.7	714.9	753.0	793.1	835.4	880.0	926.9	976.3	1,028.3	1,083.2	1,140.9	1,201.7	5.3%
Revenue (USD Million)	2,940.9	3,120.7	3,311.8	3,514.9	3,730.9	3,960.4	4,204.4	4,463.8	4,739.6	5,032.7	5,344.4	5,675.8	6.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in Singapore was 793.1 kilotons in 2017 and is anticipated to reach 1,201.7 kilotons by 2025, progressing at a CAGR of 5.3% over the forecast period. According to the Building & Construction Authority of Singapore, the construction demand increased from USD 5.1 billion in 2016 to USD 7.9 billion in 2017 and construction demand is expected to reach USD 26 billion by 2018. The increase in investment in marine industry by Singapore government, coupled with major marine companies and shipyards investing in training and development activities to support the marine industrial growth, is expected to drive the demand for polymer foam over the forecast period. Also, the proposed USD 5 billion rail infrastructure fund by Singapore government to finance Mass Rapid Transit Cross Island line and Jurong Region Line by 2020 is expected to fuel the demand for polymer foam in rail segment.

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6.4.8.2 Singapore polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 127 Singapore polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	189.6	197.8	206.4	215.4	224.7	234.4	244.6	255.2	266.2	277.8	289.8	302.4	4.3%
Polystyrene Foam	170.8	178.7	186.9	195.4	204.4	213.8	223.6	233.9	244.6	255.9	267.6	279.9	4.6%
PVC Foam	93.4	99.1	105.1	111.5	118.3	125.5	133.1	141.2	149.8	158.9	168.6	178.8	6.1%
Phenolic Foam	62.0	66.2	70.6	75.4	80.4	85.8	91.6	97.8	104.3	111.3	118.8	126.8	6.7%
Polyolefin Foam	74.9	79.7	84.9	90.3	96.1	102.3	108.8	115.8	123.2	131.2	139.6	148.5	6.4%
Melamine Foam	48.7	52.2	56.0	60.0	64.2	68.8	73.8	79.0	84.7	90.7	97.2	104.2	7.2%
Others	39.2	41.1	43.2	45.2	47.3	49.3	51.4	53.4	55.4	57.4	59.3	61.2	3.9%
Total	678.7	714.9	753.0	793.1	835.4	880.0	926.9	976.3	1,028.3	1,083.2	1,140.9	1,201.7	5.3%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyurethane foam in Singapore was 215.4 kilotons in 2017 and is anticipated to reach 302.4 kilotons by 2025, expanding at a CAGR of 4.3% over the forecast period.

Table 128 Singapore polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	677.2	716.8	758.6	802.9	849.8	899.4	951.9	1,007.4	1,066.3	1,128.5	1,194.4	1,264.1	5.8%
Polystyrene Foam	1,109.6	1,167.5	1,228.5	1,292.7	1,360.2	1,431.2	1,506.0	1,584.7	1,667.4	1,754.5	1,846.2	1,942.6	5.2%
PVC Foam	180.8	196.9	214.4	233.5	254.2	276.8	301.5	328.3	357.5	389.3	423.9	461.6	8.9%
Phenolic Foam	257.5	275.6	294.9	315.6	337.8	361.5	386.9	414.0	443.1	474.2	507.5	543.2	7.0%
Polyolefin Foam	348.6	375.3	404.1	435.2	468.6	504.5	543.2	584.9	629.8	678.2	730.2	786.2	7.7%
Melamine Foam	185.8	199.3	213.8	229.3	245.9	263.8	282.9	303.5	325.5	349.1	374.5	401.7	7.3%
Others	181.4	189.3	197.5	205.8	214.4	223.1	232.0	241.0	249.9	258.9	267.8	276.4	3.8%
Total	2,940.9	3,120.7	3,311.8	3,514.9	3,730.9	3,960.4	4,204.4	4,463.8	4,739.6	5,032.7	5,344.4	5,675.8	6.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polystyrene foam segment was valued at USD 1,292.7 million in 2017 and is projected to reach USD 1,942.6 million by 2025, advancing at a CAGR of 5.2% over the forecast period.

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6.4.8.3 Singapore polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 129 Singapore polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	69.1	72.7	76.4	80.4	84.5	88.9	93.5	98.3	103.4	108.8	114.4	120.3	5.2%
Building & construction	264.1	279.0	294.7	311.3	328.9	347.5	367.1	387.8	409.7	432.8	457.2	483.0	5.6%
Furniture & bedding	60.5	63.3	66.1	69.1	72.2	75.5	78.9	82.5	86.2	90.1	94.2	98.4	4.5%
Automotive	158.2	167.4	177.2	187.6	198.5	210.1	222.3	235.3	249.1	263.6	279.0	295.3	5.8%
Rail	38.1	39.8	41.6	43.5	45.5	47.6	49.8	52.1	54.4	56.9	59.5	62.2	4.6%
Wind	23.3	24.8	26.3	28.0	29.7	31.5	33.5	35.5	37.7	40.1	42.6	45.2	6.2%
Marine	38.8	40.7	42.7	44.8	47.0	49.3	51.7	54.2	56.9	59.7	62.7	65.7	4.9%
Others	26.6	27.3	27.9	28.5	29.1	29.6	30.1	30.5	30.9	31.2	31.5	31.6	1.3%
Total	678.7	714.9	753.0	793.1	835.4	880.0	926.9	976.3	1,028.3	1,083.2	1,140.9	1,201.7	5.3%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Wind and automotive industry will be the fastest and the second largest growing application respectively and is expected to grow at CAGR of 6.2% and CAGR of 5.8% from 2017 to 2025. The demand for polymer foam in building & construction and packaging segments are growing at a significant growth rate and is projected to have a growth rate of 5.6% and 5.2% respectively. The government is investing heavily on the industries which include building & construction industry.

Table 130 Singapore polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	332.0	353.1	375.6	399.6	425.1	452.3	481.3	512.2	545.1	580.1	617.5	657.3	6.4%
Building & construction	1,149.9	1,220.5	1,295.6	1,375.4	1,460.3	1,550.5	1,646.4	1,748.5	1,857.0	1,972.3	2,095.0	2,225.5	6.2%
Furniture & bedding	235.0	249.0	263.9	279.8	296.6	314.4	333.4	353.5	374.9	397.6	421.7	447.3	6.0%
Automotive	618.8	664.1	712.8	765.1	821.3	881.8	946.8	1,016.6	1,091.7	1,172.5	1,259.2	1,352.5	7.4%
Rail	140.6	147.3	154.4	161.8	169.5	177.7	186.3	195.3	204.8	214.7	225.2	236.1	4.8%
Wind	123.2	131.7	140.9	150.6	161.1	172.3	184.3	197.1	210.9	225.6	241.4	258.3	7.0%
Marine	182.9	190.6	198.5	206.9	215.6	224.7	234.2	244.1	254.4	265.2	276.5	288.3	4.2%
Others	158.5	164.3	170.1	175.8	181.3	186.7	191.8	196.5	200.9	204.7	208.0	210.6	2.3%
Total	2,940.9	3,120.7	3,311.8	3,514.9	3,730.9	3,960.4	4,204.4	4,463.8	4,739.6	5,032.7	5,344.4	5,675.8	6.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Packaging application segment was valued at USD 399.6 million in 2017 and is anticipated to reach USD 657.3 million by 2025, ascending at a CAGR of 6.4% over the forecast period. Building & construction application segment was valued at USD 1,375.4 million in 2017 and is projected to reach USD 2,225.5 million by 2025. Building & construction application accounted for the largest share of 39.13%% in terms of the total demand in 2017.

6.4.9 Indonesia

6.4.9.1 Indonesia polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 131 Indonesia polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	541.8	564.7	588.7	613.6	639.7	666.8	695.0	724.5	755.2	787.2	820.6	855.4	4.2%
Revenue (USD Million)	2,780.5	2,908.0	3,041.5	3,181.3	3,327.8	3,481.3	3,642.1	3,810.5	3,987.1	4,172.2	4,366.2	4,569.5	4.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in Indonesia was 164.3 kilotons in 2017 and is anticipated to reach 212.7 kilotons by 2025, progressing at a CAGR of 3.3% over the forecast period. The demand for polymer foam is expected to be driven by the robust growth in the construction industry. According to The Indonesian Iron & Steel Industry Association, the construction sector output increased from approximately USD 260 billion in 2014 to USD 320 billion by 2017. This is on account of the increase in the government spending on the construction sector. Also, the wind capacity energy capacity addition targets is also expected to drive the demand for polymer foam in wind energy segment. According to Indonesian Ministry of Energy and Mineral Resources, the government aims to meet 23% of its power mix through renewable energy by 2025.

In addition, the robust growth in the automotive sector is expected to drive the demand further. According to Association of Indonesian Automotive Industries (GAIKINDO), vehicle production increased by 15.7% in 2018 as compared to that of 2017. The upward trend in automotive vehicles production is expected to continue over the forecast period further thriving the demand for polymer foam over the forecast period.

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6.4.9.2 INDONESIA POLYMER FOAM MARKET ESTIMATES AND FORECASTS, BY TYPE, 2014–2025 (KILOTONS) (USD MILLION)

Table 132 Indonesia polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	163.4	169.5	175.8	182.3	189.1	196.1	203.4	210.9	218.7	226.9	235.3	244.0	3.7%
Polystyrene Foam	139.1	143.8	148.7	153.8	159.0	164.4	170.0	175.8	181.7	187.9	194.3	200.9	3.4%
PVC Foam	73.1	76.5	80.0	83.7	87.5	91.5	95.8	100.2	104.8	109.6	114.6	119.9	4.6%
Phenolic Foam	55.3	58.2	61.3	64.5	67.8	71.4	75.1	79.1	83.2	87.6	92.2	97.0	5.2%
Polyolefin Foam	64.1	67.2	70.5	73.9	77.4	81.2	85.1	89.2	93.4	97.9	102.7	107.6	4.8%
Melamine Foam	30.6	32.7	34.9	37.3	39.8	42.6	45.5	48.6	51.9	55.5	59.3	63.4	6.9%
Others	16.2	16.9	17.6	18.3	19.0	19.6	20.2	20.8	21.3	21.8	22.2	22.5	2.6%
Total	541.8	564.7	588.7	613.6	639.7	666.8	695.0	724.5	755.2	787.2	820.6	855.4	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polyurethane foam in Indonesia was 182.3 kilotons in 2017 and is anticipated to reach 244.0 kilotons by 2025, expanding at a CAGR of 3.7% over the forecast period.

Table 133 Indonesia polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	702.3	731.2	761.2	792.6	825.2	859.1	894.4	931.2	969.5	1,009.4	1,050.9	1,094.1	4.1%
Polystyrene Foam	1,134.3	1,174.8	1,216.7	1,260.1	1,305.0	1,351.5	1,399.7	1,449.6	1,501.3	1,554.8	1,610.3	1,667.7	3.6%
PVC Foam	166.9	177.7	189.2	201.5	214.5	228.4	243.2	259.0	275.7	293.6	312.6	332.9	6.5%
Phenolic Foam	232.3	246.9	262.5	279.0	296.5	315.2	335.0	356.1	378.5	402.3	427.6	454.5	6.3%
Polyolefin Foam	298.3	316.3	335.3	355.5	376.9	399.6	423.6	449.1	476.2	504.8	535.2	567.4	6.0%
Melamine Foam	158.9	170.1	182.1	194.9	208.6	223.3	239.0	255.9	273.9	293.2	313.8	335.9	7.0%
Others	87.5	91.0	94.5	97.9	101.1	104.2	107.1	109.7	112.0	114.1	115.7	117.0	2.3%
Total	2,780.5	2,908.0	3,041.5	3,181.3	3,327.8	3,481.3	3,642.1	3,810.5	3,987.1	4,172.2	4,366.2	4,569.5	4.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Polystyrene foam segment was valued at USD 1,260.1 million in 2017 and is projected to reach USD 1,667.7 million by 2025, advancing at a CAGR of 3.6% over the forecast period.

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6.4.9.3 INDONESIA POLYMER FOAM MARKET ESTIMATES AND FORECASTS, BY APPLICATION, 2014–2025 (KILOTONS) (USD MILLION)

Table 134 Indonesia polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	59.9	62.4	65.0	67.7	70.5	73.4	76.5	79.6	83.0	86.4	90.0	93.7	4.2%
Building & construction	225.8	236.2	247.2	258.7	270.7	283.3	296.5	310.2	324.6	339.7	355.5	372.0	4.6%
Furniture & bedding	39.3	40.7	42.2	43.7	45.3	46.9	48.6	50.3	52.1	54.0	55.9	57.9	3.6%
Automotive	103.5	108.5	113.6	119.1	124.8	130.7	136.9	143.5	150.3	157.5	165.0	172.9	4.8%
Rail	28.6	29.7	30.9	32.0	33.3	34.6	35.9	37.3	38.7	40.2	41.8	43.4	3.9%
Wind	20.4	21.5	22.7	23.9	25.2	26.6	28.0	29.6	31.2	32.9	34.7	36.6	5.5%
Marine	22.5	23.3	24.1	25.0	25.8	26.7	27.7	28.6	29.6	30.7	31.7	32.8	3.5%
Others	41.8	42.4	43.0	43.6	44.1	44.6	45.0	45.3	45.6	45.8	46.0	46.0	0.7%
Total	541.8	564.7	588.7	613.6	639.7	666.8	695.0	724.5	755.2	787.2	820.6	855.4	4.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in automotive application is expected to witness significant demand. The demand was estimated at 119.1 kilotons in 2017 and is projected to reach 172.9 kilotons by 2025 growing at a CAGR of 4.8% over the forecast period.

Table 135 Indonesia polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	301.4	313.4	325.9	338.9	352.5	366.6	381.3	396.6	412.6	429.3	446.6	464.7	4.0%
Building & construction	1,118.3	1,171.0	1,226.2	1,284.1	1,344.8	1,408.5	1,475.3	1,545.4	1,619.0	1,696.1	1,777.1	1,862.1	4.8%
Furniture & bedding	217.2	225.2	233.6	242.3	251.3	260.7	270.4	280.6	291.1	302.1	313.5	325.4	3.8%
Automotive	563.9	592.7	622.9	654.8	688.3	723.6	760.8	799.9	841.1	884.5	930.2	978.3	5.1%
Rail	178.8	187.5	196.6	206.1	216.1	226.7	237.7	249.4	261.6	274.4	287.9	302.0	4.9%
Wind	135.7	146.1	157.3	169.3	182.3	196.3	211.4	227.7	245.3	264.2	284.6	306.6	7.7%
Marine	102.0	105.1	108.3	111.6	115.0	118.5	122.1	125.9	129.7	133.7	137.8	142.1	3.1%
Others	163.2	167.1	170.8	174.2	177.4	180.3	182.9	185.0	186.7	187.9	188.4	188.3	1.0%
Total	2,780.5	2,908.0	3,041.5	3,181.3	3,327.8	3,481.3	3,642.1	3,810.5	3,987.1	4,172.2	4,366.2	4,569.5	4.6%

Source: GREA, EUROPUR, PFA, AWEA, GWEC,EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Packaging application segment was valued at USD 338.9 million in 2017 and is anticipated to reach USD 464.7 million by 2025, ascending at a CAGR of 4.0% over the forecast period. Building & construction application segment was valued at USD 1,284.1 million in 2017 and is projected to reach USD 1,862.1 million by 2025.

6.5 Central & South America

6.5.1 Central & South America Polymer Foam Market Estimates And Forecasts, 2014–2025 (Kilotons) (USD Million)

Table 136 Central & South America polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	870.3	894.3	918.9	944.3	970.3	997.0	1,024.5	1,052.7	1,081.8	1,111.6	1,142.2	1,173.7	2.8%
Revenue (USD Million)	4,460.8	4,604.4	4,753.0	4,906.9	5,066.3	5,231.4	5,402.4	5,579.5	5,763.1	5,953.2	6,150.2	6,354.4	3.3%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in Central & South America was 944.3 kilotons in 2017 and is projected to reach 1,173.7 kilotons by 2025, accelerating at a CAGR of 2.8% over the forecast period. Polyurethane foam dominated the polymer foam market in Central & South America in 2017, accounting for over 28% of the total polymer foam demand. The demand for polyurethane foam is expected to slightly decrease from 28.44% in 2017 to 28.19% by 2025, making it the dominant segment over the forecast period.

6.5.2 Central & South America polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 137 Central & South America polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Polyurethane Foam	248.5	255.0	261.7	268.6	275.6	282.9	290.4	298.0	305.9	314.0	322.3	330.8	2.6%
Polystyrene Foam	194.8	199.2	203.6	208.1	212.7	217.4	222.2	227.2	232.2	237.4	242.7	248.1	2.2%
PVC Foam	123.7	127.2	130.8	134.5	138.4	142.3	146.3	150.5	154.8	159.1	163.7	168.3	2.8%
Phenolic Foam	78.1	80.5	83.1	85.7	88.5	91.3	94.2	97.2	100.2	103.4	106.7	110.1	3.2%
Polyolefin Foam	117.4	122.0	126.8	131.7	136.9	142.3	147.9	153.7	159.7	166.0	172.5	179.3	3.9%
Melamine Foam	58.9	60.3	61.7	63.2	64.7	66.2	67.8	69.4	71.1	72.9	74.6	76.5	2.4%
Others	48.9	50.1	51.3	52.4	53.5	54.6	55.7	56.8	57.8	58.8	59.7	60.6	1.8%
Total	870.3	894.3	918.9	944.3	970.3	997.0	1,024.5	1,052.7	1,081.8	1,111.6	1,142.2	1,173.7	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polymer foam in Central & South America was driven by the growth in the automotive industry driven by the sales in Argentina, Brazil, Ecuador, Chile, and Puerto Rico. According to the Colombian Association of Motor Vehicles, the sales of passenger cars increased Chile, Ecuador, Brazil, and Argentina. The growth in the sales of sports utility vehicles and luxury vehicles is expected to drive the demand for polymer foam.

Table 138 Central & South America polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	880.3	906.4	933.3	961.0	989.6	1,019.1	1,049.5	1,080.8	1,113.1	1,146.4	1,180.7	1,216.1	3.0%
Polystyrene Foam	1,539.0	1,572.2	1,606.3	1,641.1	1,676.7	1,713.1	1,750.3	1,788.4	1,827.3	1,867.1	1,907.8	1,949.5	2.2%
PVC Foam	391.5	404.2	417.4	431.0	445.1	459.6	474.6	490.0	506.0	522.5	539.5	557.1	3.3%
Phenolic Foam	359.6	377.0	395.3	414.4	434.4	455.4	477.4	500.5	524.7	550.0	576.6	604.4	4.8%
Polyolefin Foam	1,020.1	1,062.4	1,106.4	1,152.3	1,200.1	1,249.8	1,301.6	1,355.5	1,411.7	1,470.2	1,531.1	1,594.5	4.1%
Melamine Foam	270.4	282.1	294.3	307.0	320.4	334.4	349.0	364.3	380.3	397.0	414.6	432.9	4.4%
Others	268.1	273.7	279.2	284.6	289.8	294.9	299.8	304.6	309.1	313.4	317.5	321.4	1.5%
Total	4,460.8	4,604.4	4,753.0	4,906.9	5,066.3	5,231.4	5,402.4	5,579.5	5,763.1	5,953.2	6,150.2	6,354.4	3.3%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polystyrene foam was valued as the largest in 2017, which accounted for a market share of 33.44% in 2017 and is anticipated to reach USD 1,949.5 million by 2025. It is expected to comprise a market share of 30.68% by 2025 making it the largest segment over the forecast period.

6.5.3 Central & South America polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 139 Central & South America polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	88.6	90.5	92.4	94.3	96.3	98.3	100.4	102.5	104.6	106.8	109.1	111.4	2.1%
Building & construction	305.9	315.0	324.3	334.0	343.9	354.1	364.7	375.5	386.7	398.2	410.1	422.3	3.0%
Furniture & bedding	69.2	70.2	71.3	72.3	73.4	74.5	75.6	76.7	77.9	79.1	80.2	81.4	1.5%
Automotive	194.6	201.0	207.6	214.4	221.4	228.7	236.2	244.0	252.1	260.4	269.0	277.9	3.3%
Rail	51.6	53.5	55.6	57.6	59.8	62.0	64.4	66.8	69.3	71.9	74.6	77.4	3.8%
Wind	28.4	29.8	31.3	32.9	34.6	36.3	38.2	40.1	42.2	44.3	46.6	48.9	5.1%
Marine	40.9	41.1	41.3	41.5	41.7	41.9	42.2	42.4	42.6	42.8	43.1	43.3	0.5%
Others	91.1	93.2	95.2	97.2	99.2	101.1	102.9	104.7	106.4	108.1	109.6	111.1	1.7%
Total	870.3	894.3	918.9	944.3	970.3	997.0	1,024.5	1,052.7	1,081.8	1,111.6	1,142.2	1,173.7	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The demand for polymer foam in rail application is expected to be driven by the investments from various regional governments in developing their respective railway networks. According to Argentina's Ministry of Transport, the number of new rail vehicles is expected to reach 1,748 by 2019 and 2,798 by 2023. As a part of expanding its railway network, the Government of Argentina is expected to invest USD 16.6 billion by 2023, which, in turn, is likely to boost the demand for polymer foam over the forecast period.

Table 140 Central & South America polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	512.2	526.6	541.4	556.8	572.7	589.1	606.1	623.7	641.8	660.6	680.1	700.3	2.9%
Building & construction	1,731.1	1,788.8	1,848.4	1,910.2	1,974.1	2,040.3	2,108.8	2,179.7	2,253.2	2,329.3	2,408.1	2,489.7	3.4%
Furniture & bedding	422.2	431.8	441.6	451.7	462.0	472.6	483.4	494.5	505.9	517.6	529.6	541.9	2.3%
Automotive	1,075.4	1,114.2	1,154.6	1,196.5	1,240.0	1,285.2	1,332.1	1,380.8	1,431.4	1,483.9	1,538.4	1,595.1	3.7%
Rail	313.5	321.1	329.0	337.0	345.3	353.9	362.7	371.7	381.1	390.7	400.6	410.8	2.5%
Wind	172.6	181.9	191.7	202.1	213.0	224.5	236.6	249.4	262.9	277.2	292.2	308.1	5.4%
Marine	197.2	204.0	211.0	218.2	225.7	233.5	241.6	250.0	258.6	267.6	276.9	286.5	3.5%
Others	304.6	309.6	314.4	319.0	323.3	327.3	331.0	334.3	337.3	339.8	341.8	343.2	0.9%
Total	4,728.9	4,878.1	5,032.2	5,191.5	5,356.1	5,526.3	5,702.2	5,884.1	6,072.2	6,266.6	6,467.7	6,675.7	3.2%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The growth opportunities in Central & South America are untapped, and numerous shipbuilding manufacturers are looking to expand their operations in Brazil, Peru, Panama, and Chile. The strengthening shipbuilding industry in this region is expected to drive the demand for polymer foam in the coming years.

6.5.4 Brazil

6.5.4.1 BRAZIL POLYMER FOAM MARKET ESTIMATES AND FORECASTS, 2014–2025 (KILOTONS) (USD MILLION)

Table 141 Brazil polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	402.2	411.7	421.5	431.6	441.8	452.3	463.1	474.1	485.4	497.0	508.8	520.9	2.4%
Revenue (USD Million)	2,216.7	2,278.1	2,341.3	2,406.4	2,473.5	2,542.5	2,613.7	2,687.0	2,762.6	2,840.5	2,920.7	3,003.5	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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In Brazil, the demand for polymer foam is driven by the increase in the green buildings projects. According to International Finance Corporation, Brazil is the largest green-certified building market in Central & South America as of 2017. According to Green Building Information Gateway, over 1,400 green building activities are carried out in Brazil as of 2017 and it is expected to increase as Brazil aims to reduce its greenhouse gas emissions to 75% by 2030.

6.5.4.2 BRAZIL POLYMER FOAM MARKET ESTIMATES AND FORECASTS, BY TYPE, 2014–2025 (KILOTONS) (USD MILLION)

Table 142 Brazil polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	107.4	109.4	111.4	113.5	115.6	117.8	119.9	122.2	124.4	126.7	129.1	131.5	1.9%
Polystyrene Foam	93.0	94.5	96.0	97.6	99.1	100.7	102.4	104.0	105.7	107.4	109.1	110.9	1.6%
PVC Foam	59.2	61.1	62.9	64.9	66.9	68.9	71.1	73.3	75.5	77.8	80.2	82.7	3.1%
Phenolic Foam	36.4	37.6	38.8	40.1	41.5	42.9	44.3	45.8	47.4	49.0	50.6	52.3	3.4%
Polyolefin Foam	59.0	61.2	63.4	65.8	68.2	70.7	73.3	76.1	78.9	81.8	84.8	87.9	3.7%
Melamine Foam	27.5	27.8	28.1	28.5	28.8	29.1	29.5	29.9	30.2	30.6	30.9	31.3	1.2%
Others	19.7	20.2	20.7	21.2	21.7	22.1	22.6	23.0	23.3	23.7	24.0	24.3	1.7%
Total	402.2	411.7	421.5	431.6	441.8	452.3	463.1	474.1	485.4	497.0	508.8	520.9	2.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Packaging industry is growing at a steady rate and is driving the polymer foam growth in Brazil. According to Brazilian Packaging Association, the packaging industry in Brazil increased from USD 14 billion in 2014 to USD 17 billion in 2017. Plastics accounted for the major portion of various materials used in packaging and held a market share of over 38% in 2017. The recovery of the Brazilian economy is expected to boost the growth of packaging industry in Brazil.

Table 143 Brazil polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	380.5	388.9	397.4	406.1	415.1	424.2	433.5	443.0	452.7	462.7	472.9	483.2	2.2%
Polystyrene Foam	734.4	745.9	757.6	769.4	781.5	793.7	806.2	818.8	831.6	844.7	857.9	871.3	1.6%
PVC Foam	187.5	194.0	200.8	207.9	215.1	222.7	230.5	238.6	246.9	255.6	264.5	273.8	3.5%
Phenolic Foam	167.5	175.9	184.7	194.0	203.8	214.0	224.8	236.0	247.9	260.4	273.4	287.2	5.0%
Polyolefin Foam	512.7	532.8	553.7	575.3	597.8	621.2	645.5	670.8	697.0	724.3	752.7	782.1	3.9%
Melamine Foam	126.1	130.1	134.2	138.4	142.7	147.2	151.8	156.6	161.5	166.6	171.8	177.2	3.1%
Others	108.0	110.5	112.9	115.2	117.4	119.5	121.4	123.2	124.9	126.3	127.6	128.6	1.4%
Total	2,216.7	2,278.1	2,341.3	2,406.4	2,473.5	2,542.5	2,613.7	2,687.0	2,762.6	2,840.5	2,920.7	3,003.5	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The increase in the purchasing power of the Brazilian population is attributing to the growth of furniture industry in Brazil. The tax reduction by the Federal Government in 2012, had resulted in the growth of the furniture market. The trend is expected to continue driving the demand for polymer foam over the forecast period.

6.5.4.3 BRAZIL POLYMER FOAM MARKET ESTIMATES AND FORECASTS, BY APPLICATION, 2014–2025 (KILOTONS) (USD MILLION)

Table 144 Brazil polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	41.5	42.4	43.2	44.1	45.0	45.9	46.8	47.7	48.7	49.6	50.6	51.6	2.0%
Building & construction	143.6	147.1	150.6	154.2	158.0	161.8	165.7	169.6	173.7	177.9	182.2	186.6	2.4%
Furniture & bedding	33.3	33.7	34.0	34.4	34.7	35.1	35.4	35.8	36.1	36.5	36.9	37.2	1.0%
Automotive	91.7	94.0	96.4	98.8	101.2	103.8	106.4	109.0	111.7	114.5	117.4	120.3	2.5%
Rail	24.7	25.4	26.2	27.0	27.9	28.8	29.7	30.6	31.6	32.6	33.6	34.6	3.1%
Wind	18.3	19.3	20.3	21.3	22.5	23.6	24.9	26.2	27.6	29.0	30.5	32.1	5.3%
Marine	23.2	23.2	23.3	23.3	23.4	23.4	23.4	23.5	23.5	23.6	23.6	23.6	0.2%
Others	25.8	26.7	27.5	28.4	29.2	30.1	30.9	31.7	32.5	33.3	34.0	34.7	2.5%
Total	402.2	411.7	421.5	431.6	441.8	452.3	463.1	474.1	485.4	497.0	508.8	520.9	2.4%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

Brazil has the largest installed wind capacity in Central & South America as of 2017. According to Brazil's National Electric Energy Agency (ANEEL), the installed wind energy capacity in Brazil as of 2016 was 8.7 GW. The energy policy makers in Brazil have set a target of 24 GW wind energy capacity addition by 2024. This is expected to drive the demand for polymer foam in wind energy application..

Table 145 Brazil polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	252.9	257.3	261.8	266.4	271.1	275.9	280.8	285.8	290.9	296.2	301.5	307.0	1.8%
Building & construction	759.7	782.0	804.9	828.7	853.1	878.3	904.4	931.2	959.0	987.6	1,017.1	1,047.6	3.0%
Furniture & bedding	198.4	202.4	206.5	210.6	214.9	219.3	223.8	228.3	233.0	237.8	242.8	247.8	2.1%
Automotive	519.2	535.6	552.6	570.2	588.4	607.2	626.7	646.8	667.6	689.1	711.3	734.3	3.2%
Rail	160.0	162.5	165.0	167.6	170.2	172.9	175.6	178.4	181.3	184.2	187.1	190.1	1.6%
Wind	114.6	120.8	127.3	134.1	141.4	149.0	157.0	165.5	174.5	184.0	194.0	204.5	5.4%
Marine	105.5	109.3	113.3	117.3	121.6	126.0	130.6	135.3	140.2	145.3	150.7	156.2	3.6%
Others	106.4	108.2	109.8	111.4	112.7	113.9	114.8	115.6	116.1	116.3	116.3	115.9	0.5%
Total	2,216.7	2,278.1	2,341.3	2,406.4	2,473.5	2,542.5	2,613.7	2,687.0	2,762.6	2,840.5	2,920.7	3,003.5	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Building & construction was the largest application segment in terms of revenue, accounting for 34.44% of the total revenue in 2017 in the country, and the trend is likely to continue over the forecast period. Building & construction segment is expected to account for 34.88% of the total market revenue by 2025. The segment is followed by automotive application segment, which accounted for 23.70% in 2017.

6.6 Middle East & Africa

6.6.1 Middle East & Africa polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Table 146 Middle East & Africa polymer foam market estimates and forecasts, 2014–2025 (Kilotons) (USD Million)

Region	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Volume (Kilotons)	1,661.5	1,704.4	1,748.1	1,792.7	1,838.1	1,884.4	1,931.4	1,979.3	2,028.0	2,077.4	2,127.7	2,178.8	2.5%
Revenue (USD Million)	9,016.1	9,279.2	9,549.0	9,825.5	10,109.0	10,399.5	10,697.0	11,001.8	11,314.0	11,633.5	11,960.5	12,295.0	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The demand for polymer foam in the Middle East & Africa region is expected to be driven by the construction industry in the UAE and South Africa. Investments in construction industry in the Middle East & Africa are also likely to boost the demand for polymer foam. The demand for polymer foam was 1,792.7 kilotons in 2017 and is projected to reach 2,178.8 kilotons by 2025. The market was valued at USD 9,825.5 million in 2017 and is projected to reach USD 12,295.0 million by 2025, reflecting a CAGR of 2.8% over the forecast period.

6.6.2 Middle East & Africa polymer foam market estimates and forecasts, by type, 2014–2025 (Kilotons) (USD Million)

Table 147 Middle East & Africa polymer foam market volume, by type, 2014– 2025 (Kilotons)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Polyurethane Foam	494.6	507.8	521.2	534.9	548.8	563.0	577.5	592.2	607.3	622.5	638.1	653.9	2.5%
Polystyrene Foam	388.9	395.9	402.9	409.9	417.0	424.1	431.3	438.5	445.8	453.1	460.4	467.8	1.7%
PVC Foam	242.9	249.7	256.7	263.8	271.1	278.5	286.0	293.8	301.6	309.7	317.8	326.2	2.7%
Phenolic Foam	130.9	135.0	139.2	143.4	147.8	152.3	156.9	161.6	166.4	171.3	176.3	181.5	3.0%
Polyolefin Foam	219.5	227.8	236.5	245.4	254.7	264.2	274.0	284.2	294.7	305.5	316.6	328.1	3.7%
Melamine Foam	111.5	113.4	115.4	117.3	119.3	121.3	123.3	125.3	127.3	129.3	131.3	133.3	1.6%
Others	73.1	74.8	76.4	78.0	79.5	81.0	82.4	83.7	84.9	86.1	87.1	88.0	1.5%
Total	1,661.5	1,704.4	1,748.1	1,792.7	1,838.1	1,884.4	1,931.4	1,979.3	2,028.0	2,077.4	2,127.7	2,178.8	2.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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Gauteng in South Africa is home to many wealthy individuals and the young population in South Africa keen to spend on the purchase of homes is expected to drive the growth of the residential housing market in South Africa. While in Middle East, Abu Dhabi, Dubai, and Sharjah remain the attractive destinations for construction investment. As a result, polymer foam manufacturers are expected to witness growth in the aforementioned areas.

Table 148 Middle East & Africa polymer foam market revenue, by type, 2014–2025 (USD Million)

Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Polyurethane Foam	1,752.1	1,804.7	1,858.6	1,913.8	1,970.4	2,028.2	2,087.4	2,147.9	2,209.7	2,272.9	2,337.5	2,403.4	2.9%
Polystyrene Foam	3,072.1	3,125.3	3,178.9	3,232.9	3,287.2	3,341.9	3,396.9	3,452.1	3,507.7	3,563.4	3,619.4	3,675.4	1.6%
PVC Foam	768.7	793.5	819.0	845.1	871.9	899.4	927.7	956.6	986.2	1,016.6	1,047.7	1,079.6	3.1%
Phenolic Foam	603.2	631.9	661.9	693.2	725.8	759.8	795.4	832.4	871.0	911.1	953.0	996.6	4.6%
Polyolefin Foam	1,907.5	1,984.4	2,064.1	2,146.6	2,232.1	2,320.6	2,412.1	2,506.8	2,604.7	2,706.0	2,810.6	2,918.7	3.9%
Melamine Foam	511.9	530.8	550.3	570.3	591.0	612.4	634.4	657.1	680.4	704.5	729.3	754.8	3.6%
Others	400.6	408.6	416.3	423.6	430.6	437.2	443.3	449.0	454.2	458.9	463.0	466.5	1.2%
Total	9,016.1	9,279.2	9,549.0	9,825.5	10,109.0	10,399.5	10,697.0	11,001.8	11,314.0	11,633.5	11,960.5	12,295.0	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The South African government under its National Development Plan, is committed to spend USD 52 billion to develop pubic infrastructure in South Africa. This is expected to moderately drive the demand for polymer foam in construction segment.

6.6.3 Middle East & Africa polymer foam market estimates and forecasts, by application, 2014–2025 (Kilotons) (USD Million)

Table 149 Middle East & Africa polymer foam market volume, by application, 2014–2025 (Kilotons)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017 –25)
Packaging	193.1	196.9	200.7	204.6	208.5	212.4	216.4	220.4	224.5	228.6	232.7	236.8	1.8%
Building & construction	750.5	770.8	791.6	812.7	834.3	856.4	878.8	901.7	925.0	948.7	972.9	997.5	2.6%
Furniture & bedding	154.2	157.6	161.1	164.6	168.2	171.8	175.5	179.2	183.0	186.8	190.7	194.6	2.1%
Automotive	175.1	180.8	186.6	192.6	198.8	205.1	211.6	218.2	225.0	232.0	239.1	246.4	3.1%
Rail	113.1	116.7	120.3	124.0	127.9	131.8	135.8	139.9	144.1	148.4	152.8	157.3	3.0%
Wind	62.5	64.8	67.3	69.8	72.4	75.1	77.8	80.7	83.6	86.7	89.8	93.0	3.7%
Marine	86.7	88.8	90.9	93.0	95.2	97.4	99.7	101.9	104.2	106.6	108.9	111.3	2.3%
Others	126.3	128.0	129.7	131.3	132.9	134.4	135.8	137.2	138.5	139.7	140.8	141.8	1.0%
Total	1,661.5	1,704.4	1,748.1	1,792.7	1,838.1	1,884.4	1,931.4	1,979.3	2,028.0	2,077.4	2,127.7	2,178.8	2.5%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

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The existing rail networks in Africa are currently in poor condition and require high investment to manufacture new rolling stocks and upgrade infrastructure. Several financial institutions such as the African Development Bank, Asian Development Bank, and Inter-American Development Bank (IDB) are expected to invest in new rail projects in Africa. This is likely to provide lucrative growth opportunities to polymer foam manufacturers in rail application.

Table 150 Middle East & Africa polymer foam market revenue, by application, 2014–2025 (USD Million)

Application	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	CAGR (2017–25)
Packaging	974.6	999.7	1,025.4	1,051.5	1,078.3	1,105.6	1,133.4	1,161.8	1,190.8	1,220.3	1,250.5	1,281.1	2.5%
Building & construction	4,167.2	4,294.2	4,424.6	4,558.4	4,695.8	4,836.8	4,981.4	5,129.7	5,281.9	5,437.8	5,597.7	5,761.5	3.0%
Furniture & bedding	803.3	820.3	837.5	855.0	872.8	890.8	909.1	927.6	946.5	965.6	984.9	1,004.5	2.0%
Automotive	983.7	1,011.3	1,039.5	1,068.5	1,098.1	1,128.4	1,159.4	1,191.2	1,223.6	1,256.8	1,290.7	1,325.4	2.7%
Rail	580.6	593.8	607.3	620.9	634.9	649.0	663.4	678.0	692.9	708.0	723.4	738.9	2.2%
Wind	385.9	406.0	427.2	449.4	472.7	497.2	522.9	549.8	578.1	607.7	638.7	671.3	5.1%
Marine	467.0	486.5	506.6	527.6	549.4	572.0	595.4	619.8	645.0	671.3	698.4	726.6	4.1%
Others	653.7	667.4	680.9	694.1	707.1	719.8	732.0	743.9	755.2	766.0	776.2	785.7	1.6%
Total	9,016.1	9,279.2	9,549.0	9,825.5	10,109.0	10,399.5	10,697.0	11,001.8	11,314.0	11,633.5	11,960.5	12,295.0	2.8%

Source: GREA, EUROPUR, PFA, AWEA, GWEC, EBA, EEA, ICIS, AMI, CUFCA, Primary Interviews, Grand View Research

The overall demand for polymer foam in automotive segment in Middle East & Africa segment region is expected to be driven by the substantial growth opportunities in South African automotive market. The rising consumer demand coupled with South African government offers to incentivize the tax is expected to attract more foreign investments thereby driving the demand for polymer foam over the forecast period.

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CHAPTER 07 Competitive Landscape

7.1 Vendor landscape

Company Name	Presence in the value chain
LyondellBasell Industries Holdings B.V.	Raw material supplier
Mitsui Chemicals, Inc.	Raw material supplier
Bayer AG	Raw material supplier
Sumitomo Chemical Co., Ltd.	Raw material supplier
Arkema Group	Raw material supplier, manufacturer
BASF SE	Raw material supplier, manufacturer
DowDuPont	Raw material supplier, manufacturer
Borealis AG	Raw material supplier, manufacturer
Synthos	Manufacturer
Armacell International S.A.	Manufacturer
Fritz Nauer AG	Manufacturer
JSP Corporation	Manufacturer & end user
Polymer Technologies, Inc.	Manufacturer
Recticel NV	Manufacturer
SEKISUI ALVEO AG	Manufacturer
Trelleborg AB	Manufacturer
Zotefoams Plc	Manufacturer
General Plastics	Manufacturer
Huntsman Corporation	Manufacturer
Alpha Foam Ltd.	Distributor
Sign Arts Products, Inc.	Distributor
Ramfoam Ltd	Distributor
Reklein Plastics, Inc.	Distributor
POLYMÈRES TECHNOLOGIES	Distributor
Voith GmbH	End user
SAINT-GOBAIN	End user
ATLANTIC MARINE	End user
Siemens Gamesa Renewable Energy, S.A.,	End user
WELLPACK EUROPE	End user

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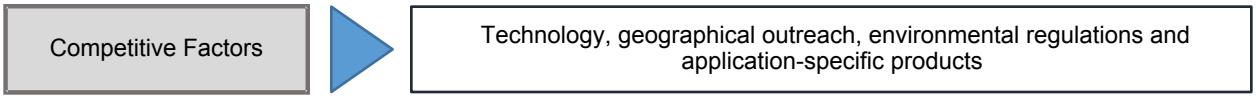
7.2 Competitive environment

The polymer foam market is fragmented in nature with various regional players such as CIRES SpA, Sealed Air, Vulcan Corporation, Premier Foam and global manufacturers such as DowDuPont Inc., BASF SE, Armacell International S.A. are well-established in the market. Majority of the manufacturers are based in North America and Europe and as a result, these regions witness high competition among the market players. The market players offer wide variety of polymer foams based on polyurethane foams, polyethylene foams, polyether foams, expanded polystyrene and serve a broad range of markets such as construction, wind energy, automotive, mass transportation, marine, and oil & gas.



The competition in Europe is intense as the market is characterized with the presence of global players such as the Recticel NV, Sekisui Alveo AG, Zotefoams Plc and others. In order to increase their profit margins to sustain in the competitive environment, manufacturers such as Armacell International S.A., Sekisui Alveo AG are expanding their geographical presence and increasing production capacities of polyolefin foams in Asia Pacific countries to cater to the growing demand from end use industries such as wind energy and railway infrastructure construction.

In the last five years, the growth in the automotive and furniture markets in Europe spurred the growth of polyurethane foam production. The growing demand for insulation materials that enhance the energy efficiency of new and refurbished buildings, particularly in Northern Europe, is also stimulating the market players to develop application specific products in line with the changing regulatory requirements. To meet the surge in the demand, Recticel has developed flexible foams that enhance the insulation system performance of residential and commercial infrastructure.

The robust growth in the construction markets in Middle East and Asia Pacific countries also led to high competition among polymeric foam manufacturers. To meet the growing demand for insulation materials in Asia Pacific region, manufacturers such as Sekisui have expanded their production capabilities in this region.

In the food packaging applications, manufacturers such as Zotefoams, Armacell, Sulzer are replacing expensive polystyrene with economical and light weight yet high strength polyethylene terephthalate. In order to meet the growing demand for sustainable materials in the packaging sector, polymer foam manufacturers are also adopting manufacturing of polymer foam products from biomaterials.

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In order to meet the wet insulation requirements, Trelleborg and General Plastics have developed syntactic polymer foams to meet the more demanding deep sea buoyancy applications. On the whole, polymeric foam manufacturers are developing application specific products to sustain the competition from industry rivals.

7.3 Company market positioning

Recticel, Armacell, JSP Corporation, Zotefoams, FoamPartner are among the leading manufacturers of polymer foams. Manufacturers such as Armacell, Recticel, Zotefoams, BASF, DowDuPont, Trelleborg have well established presence in North America and Europe with respect to the consumers in the marine, rail, renewable energy, and construction markets. While manufacturers such as Sekisui, JSP Corporation predominantly have presence in Asia and cater to the consumers in Asia Pacific region.

The aforementioned manufacturers produce a broad range of polymer foams based on polyolefins, polystyrene, and polyurethane. Geographical expansion and production capacity additions are part of the growth strategies employed by these manufacturers to increase their outreach in terms of geography and gain a competitive edge over their industry rivals. For instance, Recticel announced its plans to invest in a greenfield production site in Finland to cater to the growing demand for polymer foams in Nordic countries while Armacell expanded its foot print in North America by starting a new production line of PET foams in Canada.

Standards and regulations of polymer foams vary across region. For instance, in Europe all materials used in rail vehicles must adhere to the EN 45545-2 standard in order to ensure maximum level of safety in case of fire. Manufacturers such as BASF, Rogers Corporation are developing melamine based foam and silicone based foam respectively which comply with the stringent European Union regulatory requirements. This translates to the continuous investment in the research & development activities by the global manufacturers to develop new products that meet the changing requirements and thus retain their position in the market.

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7.4 Strategy Framework

In June 2016, BASF SE as part of its strategy to expand its high performance foam product portfolio, the company intr compostable particle foam with high bio-based content. The product is formulated using biodegradable polymers, polylact granulescharged withpentaneblowingagent

In April 2017,Armacell International S.A. expanded itsmanufacturing footprint inCanadabystarting an core foams inOntario, Canada. Theinitiativewas part of thecompany'sbusiness strategy toenhanceitsi

In June 2017, BASF SE launched'Elastospray' a low warming potential and ecofri system to meet the rising demand from construction industry for sustaina insulationperformance and increase theenergy efficiency

In June 2017, Recticel NV announced its plan to invest USD production site in Finland, as part of its production expans growing demand from Nordic countries. This initiative was demand for insulation materials in Northern Europe, on ac standards and regulationsfor efficient insulation

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CHAPTER 08 # Company Profiles

8.1 Arkema Group

8.1.1 Company overview

Arkema Group was established in 2004 and is headquartered in Colombes, France. The company is engaged in the manufacturing of specialty chemicals and advanced materials. It operates through three business segments, namely Coating Solutions, Industrial Specialties, and High-Performance Materials. The company's product portfolio includes specialty adhesives, specialty polyamides, fluoropolymers, fluorochemicals, polymethyl methacrylate (PMMA), hydrogen peroxides, acrylics, coating resins, and plastic additives.

Industrial Specialties segment comprises four sub-segments: hydrogen peroxide, flourogases, PMMA, and thiochemicals. Fluorogases business line manufactures and sells a wide range of hydro chlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs), which are served as blowing agents in the production of polyurethane foam. It offers HCFC and HFC products to cater to the demands of manufacturers operating in the refrigeration & air-conditioning and fluoropolymers markets. Flourogases business line also develops low global warming and zero ozone depletion potential hydro-fluoro-olefin blowing agent. In 2017, flourogases business line accounted for over 9% of the Industrial Specialties segment revenue. The business line has production sites in the U.S, China, and France. As of 2017, the company employed over 19,800 employees in more than 55 countries. It is listed on the Euronext Paris Stock Exchange.

8.1.2 Financial performance

2016	2017
USD 2.71 Billion (Sales of Industrial Specialties Segment)	USD 2.98 Billion (Sales of Industrial Specialties Segment)

Note: 1 USD = 0.85 EUR

8.1.3 Product benchmarking

Products/Brands	Application
Forane	It is a series of low global warming potential liquid blowing agents used in the manufacturing of polymer foams for transportation applications

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8.2 Armacell International S.A.

8.2.1 Company overview

Armacell International S.A. was founded in 2000 and is headquartered in Munster, Germany. The company is engaged in the production of various types of insulation materials and engineered foams. It operates its business through two segments: Advanced Insulation and Engineered Foams. The Engineered Foams segment produces polyethylene terephthalate foams, cross-linked polyolefin foams, engineered plastic, and polyethylene foams. Its products serve the requirements of a broad range of industries such as rail transportation, marine, construction, and wind energy, where performance, tensile strength, and lightweight are of high importance. In 2017, Engineered Foams segment accounted for 21% of the overall revenue of the company and on the regional front, Europe accounted for the largest market share.

Advanced Insulation segment of the company produces flexible foam for insulation of technical equipment used in oil & gas; construction & residential applications such as refrigeration, heating, ventilation, and air conditioning (HVAC); heating and plumbing; and solar equipment and accessories. As of 2017, the company had 2,990 employees working in 15 countries.

8.2.2 Financial performance

2016	2017
USD 147.85 Million (Sales of Engineered Foams Segment)	USD 148.08 Million (Sales of Engineered Foams Segment)

Note 1 USD = 0.85 EUR

8.2.3 Product benchmarking

Products/Brands	Application
ArmaForm	It is a lightweight PET core foam suitable for use in weight-sensitive products like wind turbine blades
ArmaFlex	It is a series of elastomeric foam insulation products used in fire safety and acoustic applications for all types of marine vessels, HVAC, and plumbing systems in buildings

8.2.4 Strategic initiative

- In April 2017, the company expanded its manufacturing footprint in Canada by starting a new production line of PET core foams in Ontario. The initiative was a part of the company's business strategy to enhance its international presence.

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8.3 BASF SE

8.3.1 Company overview

BASF SE was established in 1865 and is headquartered in Ludwigshafen, Germany. It is engaged in the production of a broad range of products such as petrochemicals, catalysts, nutrition products, coatings, monomers, intermediates, construction chemicals, performance materials & chemicals, dispersions & pigments, crop protection products, and personal care chemicals. It caters its products to various industries including agriculture, automotive & transportation, pharmaceuticals, oil & gas, food & beverages, and construction. The company has segregated its business into five segments, namely Functional Materials & Solutions, Chemicals, Agricultural Solutions, Performance Products, and Oil & Gas.

Functional Materials & Solutions segment comprises four divisions: catalysts, construction chemicals, performance materials, and coatings. Its performance materials division produces polyurethanes, thermoplastics, standard foams, and specialty foams to cater to the demands of automotive, electrical engineering, packaging, household, renewable energy, construction, and pharmaceutical markets. In 2017, performance materials division accounted for more than 37% of the total revenue of Functional Materials & Solutions segment. In terms of sales, Europe accounted for more than 48% of the total sales of performance materials division. As per the company's annual report, the significant rise in sales prices of styrene foams and polyurethane systems boosted the growth of performance materials division. As of 2017, the company had an employee strength of 115,490 and is traded on London Stock Exchange plc, Swiss Exchange Ltd, and Deutsche Börse.

8.3.2 Financial performance

2016	2017
USD 21.93 Billion (Sales of Functional Materials & Solutions Segment)	USD 24.29 Billion (Sales of Functional Materials & Solutions Segment)

Note: 1 USD = 0.85 EUR

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8.3.3 Product benchmarking

Products/Brands	Application
Elastoflex	It is a polyurethane foam used in manufacturing seats for boats and is resistant to ultraviolet rays and water
Elastopor	It is used to create cost-effective, lightweight, and durable surfboard blanks
Walltite	It is a closed cell spray polyurethane foam system used for insulation and air barrier system applications in commercial construction
Spraytite	It is a closed cell spray polyurethane foam system used for insulation and air barrier system applications in residential construction
Enertite	It is an open cell spray polyurethane foam system used as insulation material in residential and commercial construction

8.3.4 Strategic Initiatives

- In June 2017, the company launched 'Elastospray', a low warming potential and ecofriendly spray foam insulation system, to meet the rising demand from construction industry for sustainable products that maximize insulation performance and increase energy efficiency
- In June 2016, the company introduced 'Ecovio', a compostable particle foam with high bio-based content as a part of its strategy to expand its high-performance foam product portfolio. The product is formulated using biodegradable polymers, polylactic acid, and expandable granules charged with pentane blowing agent.

8.4 Borealis AG

8.4.1 Company overview

Borealis AG was established in 1994 and is headquartered in Vienna, Austria. The company is a manufacturer of various base chemicals, fertilizers, and polyolefins. It produces polyolefins and base chemicals that form the raw materials of various plastics used in automotive, energy, and pipes & fittings markets. The company has divided its business into two segments: Polyolefins and Base Chemicals.

Polyolefins segment of the company manufactures, markets, and distributes various polyolefin products such as polypropylene, polyethylene, and recycled polymer materials for energy, pipe, consumer products, and automotive industries. The segment produces environment-friendly, high melt strength polypropylene for use in polymer foam extrusion process. Base Chemicals segment offers a wide range of base chemicals such as phenol, propylene, melamine, acetone, and ethylene. Polyolefins segment accounted for more than 67% of the company's total revenue. As of 2017, the company had over 6,600 employees and has a geographical presence in over 120 countries. It is listed on the Vienna Stock Exchange.

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8.4.2 Financial performance

2016	2017
USD 5.62 Billion (Sales of Polyolefins Segment)	USD 5.94 Billion (Sales of Polyolefins Segment)

Note: 1 USD = 0.85 EUR

8.4.3 Product benchmarking

Products/Brands	Description
Daploy	It is a long chain branched polypropylene polymer having a high melt strength used in a wide range of industries such as food packaging, building & construction, and automotive

8.5 Fritz Nauer AG

8.5.1 Company overview

Fritz Nauer AG was established in 1937 and became a part of Conzzeta in 1980. The company is a business unit of chemical specialties segment of Conzzeta and is headquartered in Wolfhausen, Switzerland. It is a manufacturer of foam materials and offers a diverse product portfolio of over 200 types of foam based on polyurethane foam technology.

The company's products are used as filters, insulation components, seals, polishing pads, and acoustic components and systems. Its products are used in various applications such as sheet metal processing, sporting goods, graphic coatings, and glass processing. The company operates in various locations in Europe, Asia Pacific, and the Americas and has a widespread distribution network in over 58 countries. As of 2017, it had more than 1,100 employees.

8.5.2 Financial performance

2016	2017
USD 222.19 Million (Overall Sales)	USD 281.22 Million (Overall Sales)

Note: 1 USD = 0.99 CHF

8.5.3 Product benchmarking

Products/Brands	Application
OBoSonic	They are polyurethane-based foams used in automotive, construction, and furniture industries
ConstruPUR	
Bolasto	

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8.6 Koepp Schaum GmbH

8.6.1 Company overview

Koepp Schaum GmbH was established in 1954 and is headquartered in Oestrich-Winkel, Germany. Since 1985, the company operates as a subsidiary of Vita (Lux III) S.à r.l., which is also engaged in the production of flexible polyurethane foam and impregnated foams. The parent organization, Vita, has a geographical presence in the UK, the Netherlands, France, Germany, Slovakia, Poland, Lithuania, Romania, Bulgaria, Hungary, Croatia, and China.

Koepp Schaum is a manufacturer of a broad range of foams including composite foams, polyether foams, polyester foams, and reticulated foams. It offers its foam products in various forms such as block foams, shaped cuts & compression cuts, blanks, sheet goods, and in customized forms. The company produces environment-friendly foams using carbon dioxide as a blowing agent. It caters its products to various markets such as furniture, packaging, and automotive. The company has production plants in Elchingen and Aschau, Germany.

8.6.2 Financial performance

2016	2017
N/A	N/A

Note: Koepp Schaum GmbH did not disclose its financial data for the years 2016 and 2017.

8.6.3 Product benchmarking

Products/Brands	Description
Hilo	It is a series of foams based on polyester and polyether, used in various applications such as automotive, furniture, and packaging

8.7 JSP Corporation

8.7.1 Company overview

JSP Corporation was established in 1962 and is headquartered in Tokyo, Japan. The company is engaged in the production of foam plastic materials that serve the needs of construction, automotive, and packaging industries. The company classified its business operations into Extrusion Business and Bead Business. Extrusion Business segment produces polyethylene, polystyrene, and polypropylene sheets and boards.

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Bead Business segment is engaged in the manufacturing and sales of foamed polystyrene, foamed polyethylene, and foamed polypropylene products under the brand names ARPRO, SYTRODIA, and FOAMCORE, respectively. Its products are used in various applications including multi-use transport packaging, safety components for automotive, and HVAC systems. In 2017, the sales of Bead Business segment accounted for 59.9% of the total company sales. The company has manufacturing plants located in China, Singapore, India, South Korea, Taiwan, France, and the Czech Republic.

8.7.2 Financial performance

2016	2017
USD 637.16 Million (Sales of Bead Business Segment)	USD 587.61 Million (Sales of Bead Business Segment)

Note: 1 USD = 111.21 JPY

8.7.3 Product benchmarking

Products/Brands	Description
Foamcore	It consists of a solid outer layer and expanded foam core that is used as a ceiling material in prefabricated bathroom and automotive components
Arpro	It is an expanded polypropylene bead used in marine and packaging industries

8.8 Polymer Technologies, Inc.

8.8.1 Company overview

Polymer Technologies, Inc. was established in 1989 and is headquartered in Delaware, U.S. It is engaged in the production of various products such as adhesive materials, foam gaskets, film facings, vibration and thermal insulation materials, and acoustic barriers that are used in applications such as air & fluid transfer, temperature control, noise reduction, and vibration control. Its products cater to various markets including marine, energy, agriculture, medical, defense, and transportation.

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The company has divided its business activities into two divisions: Molded Products division and Elastomeric Solutions division. Its Molded Products division is engaged in the development of hoses & molded rubber parts, molded foam, adhesive materials, and others. The division offers its products to various consumers engaged in the production of power generation equipment, rail equipment, and mass transportation equipment. Its production facility is located in northern New Jersey, U.S. The company's Elastomeric Solutions division is engaged in the production of shock and vibration isolation materials used in aerospace, defense, medical equipment, and transportation. Its manufacturing facility is located in Massachusetts, U.S.

8.8.2 Product benchmarking

Products/Brands	Description
Polyform	It is a series of low-density and high-density polyurethane-based foam products used for vibration control and noise & temperature controlling applications in industrial machinery, medical, and transportation equipment
Polydamp	It is a melamine foam having thermal and acoustical insulation properties and used in power generation, construction, bus, and rail applications.

8.9 Recticel NV

8.9.1 Company overview

Recticel NV was established in 1778 and is headquartered in Brussels, Belgium. The company is a manufacturer of polyurethane-based thermal insulation and lightweight seating and mattresses for residential construction projects and building refurbishments. Its products also serve various automotive and industrial applications. The company has classified its overall business into four segments, namely Flexible Foams, Bedding Segment, Automotive, and Insulation.

Its Flexible Foams division produces polyurethane foam for use in various industrial applications in transportation, building & construction, consumer goods, and medical devices industries. Insulation segment offers a broad range of insulation products for residential, industrial, and commercial applications. Its Bedding business segment is engaged in the development and production of slats, bed bases, and finished mattresses. Under Automotive business segment, the company produces door panels, instrument panels, foam pads, interior trims, and other automotive components. In 2017, Flexible Foams segment accounted for more than 42% of the total sales of the company. It is listed on Euronext Brussels, and as of 2017, the company had more than 8,411 employees working in 28 countries.

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8.9.2 Financial performance

2016	2017
USD 709.70 Million (Sales of Flexible Foams Segment)	USD 731.79 Million (Sales of Flexible Foams Segment)

Note: 1 USD = 0.85 EUR

8.9.3 Product benchmarking

Products/Brands	Application
Flexible Foams	These are polyurethane-based flexible foams that are used in automotive, residential construction, and industrial applications
Colo-Fast	These are a series of polyurethane foam products used in automotive applications
Colo-Sense	
CompoLite	

8.9.4 Strategic initiative

- In June 2017, the company announced its plan to invest USD 27.7 million in a Greenfield production site in Finland, as a part of its production expansion activity to meet the growing demand from Nordic countries. This initiative was aimed at catering to the rising demand for insulation materials in Northern Europe, on account of stringent insulation standards and regulations for better insulation.

8.10 Rogers Corporation

8.10.1 Company overview

Rogers Corporation was founded in 1832 and is headquartered in Arizona, U.S. It manufactures and sells engineered materials, advanced foams, high-frequency printed circuit materials and components for electronics, automotive, industrial, and aerospace sectors. Its business operations are categorized into three segments: Elastomeric Material Solutions, Advanced Connectivity Solutions, and Power Electronic Solutions.

Elastomeric Material Solutions segment of the company manufactures and sells elastomers such as polyurethane and silicone foam products for sealing, cushioning, impact protection, and vibration management applications in automotive & transportation, consumer goods, electronics, construction, and printing markets. In 2017, Elastomeric Material Solutions segment accounted for the highest market share and contributed more than 38% of the overall sales of the company.

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The segment has manufacturing facilities in the U.S, China, and Japan. Advanced Connectivity Solutions segment manufactures circuit materials, wireless communication infrastructure, automotive driver assistance systems, and wired infrastructure. Power Electronics Solutions segment manufactures ceramic substrate materials, laminated busbars, and micro-channel coolers. As of 2017, the company had over 24,500 employees and is listed on the Toronto Stock Exchange and New York Stock Exchange.

8.10.2 Financial performance

2016	2017
USD 203.18 Million (Sales of Elastomeric Material Solutions Segment)	USD 312.66 Million (Sales of Elastomeric Material Solutions Segment)

8.10.3 Product benchmarking

Products/Brands	Application
Poron	It is a series of polyurethane foam products used in gasketing, cushioning, and sealing applications in automotive and electronic industries
Bisco	It is a series of silicone foam products used in bun, circular, and solid shapes for marine and electronic applications
Poron	It is a series of polyurethane foams used in automotive and electronics industries

8.11 SEKISUI ALVEO AG

8.11.1 Company overview

SEKISUI ALVEO AG was founded in 1971 and is headquartered in Lucerne, Switzerland. It is a subsidiary of a Japanese company Sekisui Chemical Co., Ltd. and operating as a separate entity since 1973. It produces and sells polyolefin foams and serves consumers primarily in Europe and South America.

The product portfolio of the company includes roll foams and block foams and are marketed under the brand names Alveolit, Alveolen, Aleveocel, and Alveosoft. It caters its products to various industries such as coating, automotive, construction, industrial, and consumer goods. The company has production facilities located in Roermond (the Netherlands) and Bad Sobernheim (Germany) and sales offices spread across Europe and South America.

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8.11.2 Financial performance

2016	2017
N/A	N/A

Note: SEKISUI ALVEO AG did not disclose its financial data for the years 2016 and 2017.

8.11.3 Product benchmarking

Products/Brands	Description
Thermobreak	It is a closed cell cross-linked polyolefin foam insulation material, which meets fire and smoke safety requirements in railway vehicles
Softlon	It is a cross-linked closed cell polyolefin foam used for thermal insulation in rail, road, and building & construction applications
Alveolen	
Alveolit	It is a cross-linked polyolefin foam used as an adhesive tape and an insulating material in automotive applications
Alveobloc	It is a cross-linked polyolefin foam used in packaging industry

8.11.4 Strategic initiative

- In March 2017, SEKISUI ALVEO AG's parent company Sekisui Chemical Co., Ltd. announced its plans to open a new polyolefin foam manufacturing plant in Hebei Province, China with an investment of USD 24 million, on account of the growing demand for interior trims in automobiles

8.12 Synthos S.A.

8.12.1 Company overview

Synthos S.A. was established in 1945 and is headquartered in Oswiecim, Poland. The company is a producer of various chemical raw materials such as chemical rubber and expanded and extruded polystyrene. The company's business activities are divided into four segments: Synthetic Rubber, Styrene Plastics, Dispersion Adhesives and Latex, and Agro.

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Using emulsion polymerization technology, Synthetic Rubber segment produces four different types of synthetic rubbers such as nitrile butadiene rubber, high styrene rubbers, polybutadiene rubber, and styrene butadiene rubber. The segment caters these products to tire manufacturers. Styrene Plastics segment offers four main products produced from styrene polymerization process, such as expanded polystyrene, extruded polystyrene, general-purpose polystyrene resins, high-impact polystyrene. The segment's products find use in building & construction, electronics, and packaging industries. This segment has manufacturing facilities in Poland and the Czech Republic. As of 2016, the company had 2,643 employees and is listed on the Warsaw Stock Exchange (WSE).

8.12.2 Financial performance

2016	2017
USD 459.52 Million (Sales of Styrene Plastics Segment)	N/A

Note: 1 USD = 3.68 PLN, the company did not disclose its financial data for the year 2017.

8.12.3 Product benchmarking

Products/Brands	Description
InSphere	It is a self-extinguishing expandable polystyrene with a reduced content of hydrocarbon foaming agent and reduced water absorption. It is used for thermal and acoustic insulation in building & construction industry
InVento	It is a self-extinguishing expandable polystyrene, which exhibits properties such as flame retardancy, low thermal conductivity, low water absorption, external lubricants to facilitate processing operations, and coloring agent. It is used in decoration items, packaging, and building & construction industry
Synthos XPS	It is an expanded polystyrene foam. It is primarily used in building & construction sector owing to its high resistance to moisture, good thermal insulation, and outstanding durability

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8.13 DowDuPont, Inc.

8.13.1 Company overview

DowDuPont, Inc. is formed by the merger of The Dow Chemical Company and E.I. du Pont de Nemours & Company in 2017. The company is headquartered in Michigan, U.S., and operates its business through eight segments: Safety & Construction, Performance Materials & Coatings, Agriculture, Electronics & Imaging, Packaging & Specialty Plastics, Transportation & Advanced Polymers, Nutrition & Biosciences, and Industrial Intermediates & Infrastructure. The company, through its subsidiaries, manufactures a wide range of products including specialty chemicals, agricultural products, and performance materials and delivers its products and solutions to industries such as energy, electronics, packaging, automotive, aerospace, and agriculture.

Safety & Construction segment of the company produces a broad range of engineered products such as barriers, polymer foams, insulation materials, reverse osmosis elements, and high-strength materials. These products are marketed under the brand names such as Styrofoam, Filmtec, Kevlar, and Tyvek, serving the needs of building & construction, marine, and transportation industries. As stated in its 2017 annual report, the segment is planning to invest in various initiatives such as the development of new roofing products, safety equipment for fire fighters, and flame resistant cargo containers. In 2017, North America accounted for the largest share in terms of sales of the safety & construction segment. As of 2017, the company had over 98,000 employees working across the globe and is listed on the New York Stock Exchange.

8.13.2 Financial performance

2016	2017
USD 4.98 Billion (Sales of Safety & Construction Segment)	USD 5.14 Billion (Sales of Safety & Construction Segment)

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8.13.3 Product benchmarking

Products/Brands	Application
Styrofoam	It is a series of extruded polystyrene foam insulation products used in residential, commercial, agriculture, building, and transportation applications
Froth Pak	It is a polyurethane foam insulation material used in marine applications including sound damping, vibration control, and flotation & buoyancy
Specflex	It is a polyurethane foam used for cushioning and seating applications in automotive & transportation industry
Betafoam	It is a polyurethane foam used in automotive applications for noise absorption and insulation

8.14 Trelleborg AB

8.14.1 Company overview

Trelleborg AB was established in 1905 and is headquartered in Scania, Sweden. The company is engaged in manufacturing various types of pharmaceutical grade silicone tubing, sealing products, and bearings & bushings and offers automotive damping solutions. It caters its products to various industries including aerospace, construction & mining, manufacturing, marine, building & construction, oil & gas, healthcare, and energy.

The company classified its business areas into various segments, namely Trelleborg Sealing Solutions, Trelleborg Coated Systems, Trelleborg Industrial Solutions, Trelleborg Wheel Systems, Trelleborg Offshore & Construction, and Rubena Savatech. Trelleborg Offshore & Construction segment manufactures a broad range of syntactic foams used in oil & gas and marine applications and markets them under the brand name 'Eccofloat'. In 2017, the segment accounted for over 9% of the overall sales of the company. Accounting for more than 40% of the sales, Asia Pacific region emerged as the largest market contributing to the sales of the offshore & construction segment. Trelleborg Industrial Solutions segment offers various polymer products, which are used as sealing and anti-vibrating materials in rail, marine vessels, and industrial equipment. As of 2017, the company had 23,152 employees and is listed on the Stockholm Stock Exchange.

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8.14.2 Financial performance

2016	2017
USD 955.42 Million (Sales of Offshore & Construction Segment & Industrial Solutions Segment)	USD 977.94 Million (Sales of Offshore & Construction Segment & Industrial Solutions Segment)

1 USD = 8.79 SEK

8.14.3 Product benchmarking

Products/Brands	Application
Eccofloat	It is a series of syntactic foams used in manned and unmanned vehicles, acoustic windows, hydroplanes, rudders, and trim adjustment modules for submarines.
Vector	It is made using microcellular polyurethane technology and is used in various rail track applications such as floating slab track, rail pads, under sleeper mats, slab track bearings, ballast mats, and low-vibration track elements
Intek	It is a lightweight, non-flammable rail foam insulation product used in applications such as sidewall & roof insulation in passenger carriages, engine compartments, window & door enclosures, and underfloor insulation in trains

8.14.4 Strategic initiative

- In February 2017, the Applied Technologies division of the company introduced two syntactic foams Eccofloat TG30 and TG32 as a part of its Eccofloat product portfolio to meet the customer requirements for deep-sea buoyancy applications in North America

8.15 Zotefoams plc

8.15.1 Company overview

Zotefoams plc was established in 1940 and is headquartered in London, UK. The company is engaged in the manufacturing of cellular materials and lightweight, cross-linked polyolefin block foams that are used in various applications in marine, automotive, aerospace, construction, industrial machinery, and medical industries.

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The company divided its business operations into three reportable segments: Polyolefin Foams, MuCell Extrusion LLC (MEL), and High Performance Products (HPP). Under Polyolefin Foams segment, the company manufactures polyolefin foams using nitrogen gas and autoclave process. Its polyolefin foams are marketed under the brand name AZOTE. It caters its products to various industries including packaging, aircraft, medical equipment, construction, automotive & transportation. In 2017, the sales of Polyolefin Foam segment represented over 75% of the company's total revenues. The company has its presence in North America, Europe, and Asia. The product portfolio of HPP segment includes nylon foams and fluoropolymer foams and are marketed under the brand name ZOTEK. MEL segment licenses microcellular foam technology and sells related machinery.

8.15.2 Financial performance

2016	2017
USD 69.51 Million (Sales of Polyolefin Foams Segment)	USD 69.51 Million (Sales of Polyolefin Foams Segment)

Note: 1 USD = 0.75 GBP

8.15.3 Product benchmarking

Products/Brands	Description
Azote	It is a series of closed cell and cross-linked polyolefin foams based on various ethylene copolymers and used in marine applications such as the production of man overboard, fenders, buoys, and floats for umbilical, ropes, and cables
Zotek	It is a series of high-performance foams formulated from engineering polymers, specialty elastomers, and fluoropolymers used as insulation materials in trams, buses, trains, and aircraft

8.15.4 Strategic initiatives

- In May 2018, the company announced its plans to invest USD 30 million in a new foam manufacturing plant in Poland with an annual production capacity of 45,000–50,000 m^3, and scheduled to commence its production by 2020
- In December 2017, the company invested USD 9.24 million in its existing facility in Kentucky, U.S., to expand its block foams production capacity by 20% and commenced sales of its block foams in February 2018.

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8.16 Woodbridge Foam Corporation

8.16.1 Company overview

Woodbridge Foam Corporation was established in 1978 and is headquartered in Mississauga, Canada. It offers chemical conversion technologies to support several sectors across the globe. The Woodbridge Foam Corporation offers modern particle foams and urethane in order to serve military, automotive, commercial, and recreational vehicle sectors along with other sectors such as building products, healthcare, and protective packing. The company's polyurethane foam line is used in armrests, rear seat bolsters, head restraints, and carpet padding.

The company is a bulk supplier of consoles, steering wheels, and side mirrors, as well as supply foam products that offer safety, comfort, insulation, and energy absorption to the packaging and building & construction industries. The processes of Woodbridge are designed, commercialized, and built in-house, which consists of automated production lines that produce a wide range of high-quality products. The company had 62 manufacturing facilities located in 17 countries across Europe, Asia Pacific, and Americas. As of 2018, the company had 9,000 employees working worldwide.

8.16.2 Financial performance

2016	2017
N/A	N/A

Note- Woodbridge Foam Corporation is a privately held company and did not disclose its financial information in 2016 and 2017.

8.16.3 Product Benchmarking

Products/Brands	Description
Polyester foam	It is a series of filter foams, shock absorbing foams, and sponge foams based on polyester
Polyether foam	It is a series of polyether foams and hydrolysis resistant polyether filer foams
Polyurethane foam	It is a series of explosion suppression foams, non-absorbent outdoor foams, surge/noise mitigation foams, sealing foams, and biocompatible foams based on polyurethane
Hydrophilic foam	It is a biocompatible and non-swelling hydrophilic foam for wound care therapy applications

8.16.4 Strategic Initiative

- In July 2018, Woodbridge Alabama, a part of the Woodbridge Foam Corporation, opened a new manufacturing plant in Huntsville, Alabama, U.S. It manufactures and supplies automotive parts and polyurethane seating foam to automotive manufacturers in the U.S.

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8.17 Sealed Air Corporation

8.17.1 Company overview

Sealed Air Corporation was established in 1960 and is headquartered in North Carolina, U.S. The company offers packaging solutions such as sealed wraps and bubble wraps for e-commerce, electronics, food, and manufacturing industries. The company divided its business operations into two segments: food care and product care.

The product care segment offers various solutions such as automated packaging systems; protective solutions including shrink packaging systems, shrink films, cellular packaging systems, polyurethane foam packaging systems, and suspension & retention packaging systems; and fabricated foam solutions to safeguard substances or goods from damage or temperature fluctuations during transit. Its packaging and protective solutions are marketed under the brand names Bubble Wrap, AirCap, Shanklin FloWrap, Cryovac, Instapak, Jiffy, Korrvu, Instapak, and Ethafoam.

8.17.2 Financial performance

2016	2017
USD 1.52 Billion (Sales of Product Care segment)	USD 1.64 Billion (Sales of Product Care segment)

8.17.3 Product benchmarking

Products/Brands	Application
Instapak foam packaging	It is used to provide cushioning effect for the protection of products during shipping and stocking

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