NEWSLETTER

Industrials

Building Materials

Building
With continuous innovation and digital transformation

October 2019

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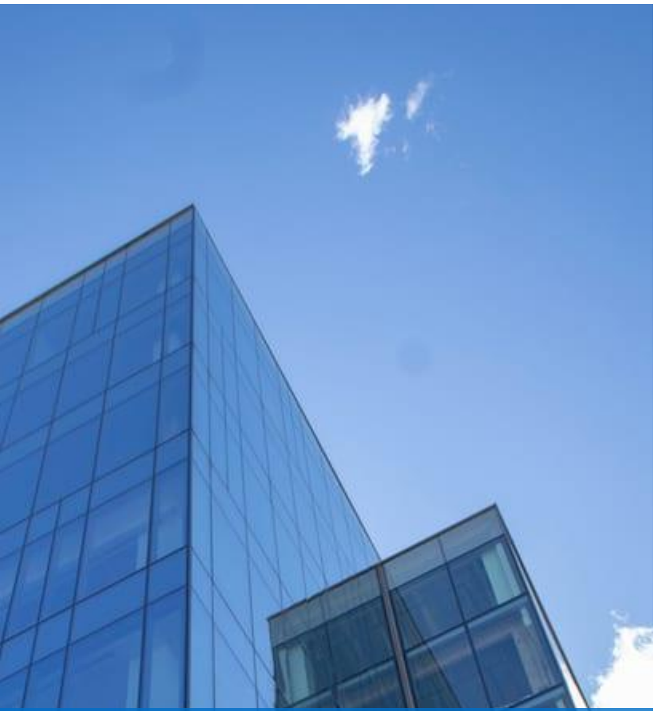


The Building Materials industry is undergoing significant transformation. Digitalization presents a long term potential for the industry. Several nations are looking beyond greener buildings and focusing to develop buildings that offer healthier environments, “smart” buildings where efficiencies are maximized through information collection and system-to-system communication, and buildings that provide resilience on account of natural and man-made risks.

Despite upward trends in sector performance, the workforce shortage in the construction industry looks like it may persist in the near term.

M&A activity is robust, fueled by multiple categories of strategic players seeking consolidation, geographical expansion and innovative products/services, while increasing penetration in faster-growing, more specialized categories. Additionally, building materials interest and investment by the private equity community continues to accelerate in pursuit of buy-and-build strategies worldwide.

Key Takeaways

The global building materials industry will be transformed on account of the rise of emerging countries, new consumer classes and resource demand. The shape of the building materials industry will depend on tri-polar interactions between people, economies and demand.

Population

The household size is anticipated to decline as growing number of developing nations are expected to develop residential and commercial sectors and progress in line with the developed countries. Such trend will improve the living standard and extend life expectancy that will increase demand for new housing development.

Economy

Countries and regions will continue to compete in the global market. The existing global economic power will be rebalanced by a new league of economies through 2030. These growing economies are brandishing their strengths during the financial crisis to be regarded as a safer place for investment and growth during 2020 – 2030. China, India and Brazil will be ranked among the five largest economies in terms of Gross Domestic Products (GDP) ranking. China alone will contribute about 20% of the global GDP.

Trade Impact

The US trade tariffs (ranging from 25-50%) to a wide range of imports including aluminum, and steel is expected to have adverse ripple effects on the targeted long-term trading partners including China, Canada, Mexico, and the EU. According to IMF, global growth is now projected to slow from 3.6% in 2018 to 3.2% in 2019, before returning to 3.5% in 2020. These regressive market developments are expected to have the potential to adversely impact economic activities and in-turn will affect the property markets worldwide.

GDP

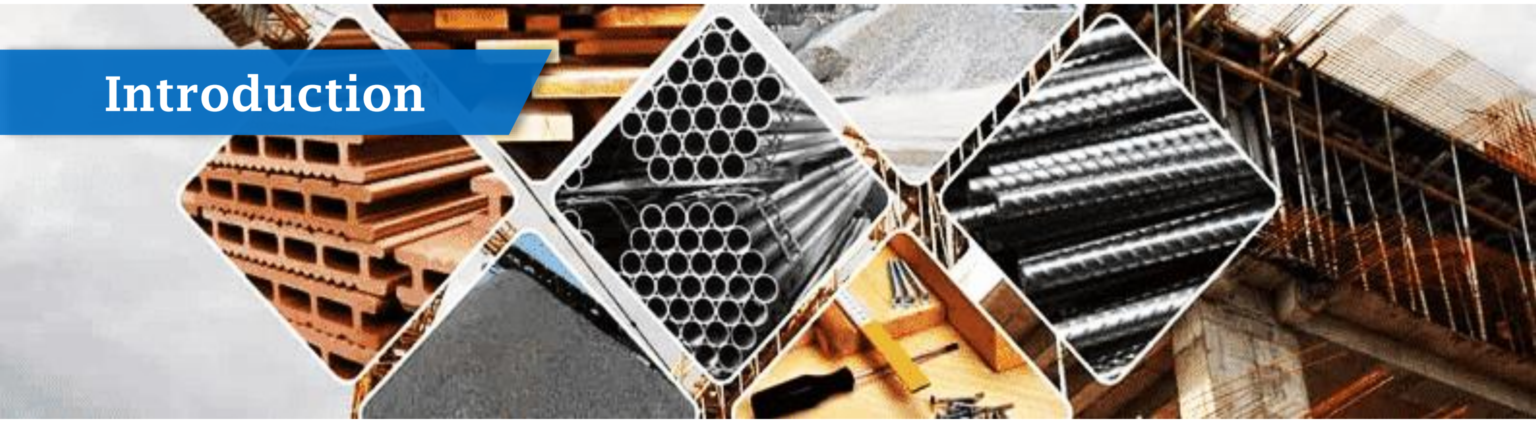
China is expected to succeed the US by GDP in the 2020s; however, India is expected to showcase significant growth in the global economic power. India will grow from ninth in 2010 to the top three in the 2020s. The country's GDP will double to that of Japan and more than half of the US by 2030. Additionally, Brazil will join the top 5 and Russia the top 10 in the 2020s.

Housing Market

The global housing markets have been steadily climbing up showcasing positive sentiments; however, the near-term outlook of the market remains unpredictable due to the unstable movements in housing prices across various countries. Consequently, the market is anticipated to largely remain flat, while an expected stable growth in the long-run. Moreover, significantly high house price valuations hints to a risk of falling prices in the quarters ahead.

Segment Highlight

Flooring is expected to be the largest segment during the forecast period (2019 – 2025) driven by strong growth in the Asian sub-continent, which continues to remain the largest consumer of ceramic tiles. Lighting is expected to emerge as the fastest-growing segment during 2019 – 2025. Such strong growth will be largely driven by fast-pace Light Emitted Diode (LED) segment that will be regarded as the most-promising technology in commercial viability among several kinds of clean technologies.



Introduction

Market Definition

The building materials industry includes suppliers of the raw materials used by construction firms when building commercial and residential properties. The building materials industry has been classified as the products that require additional labor or installation including roofing materials; sanitary ware; plumbing; lighting fixtures; doors; windows, tools; hardware; and heating, ventilation, and air conditioning (HVAC) equipment.

Additionally, the building materials include other specialty products used in repair, maintenance, and remodeling of buildings. The building materials industry in the residential and commercial sectors include manufacturers of building components, home improvement products, and equipment.

Product Categories

Windows, Doors and Cabinetry	Plumbing and Hardware	PVC Pipes
HVAC	Lighting	Flooring
Roofing and Siding	Insulation	Paints and Coatings

Classification of Building Materials

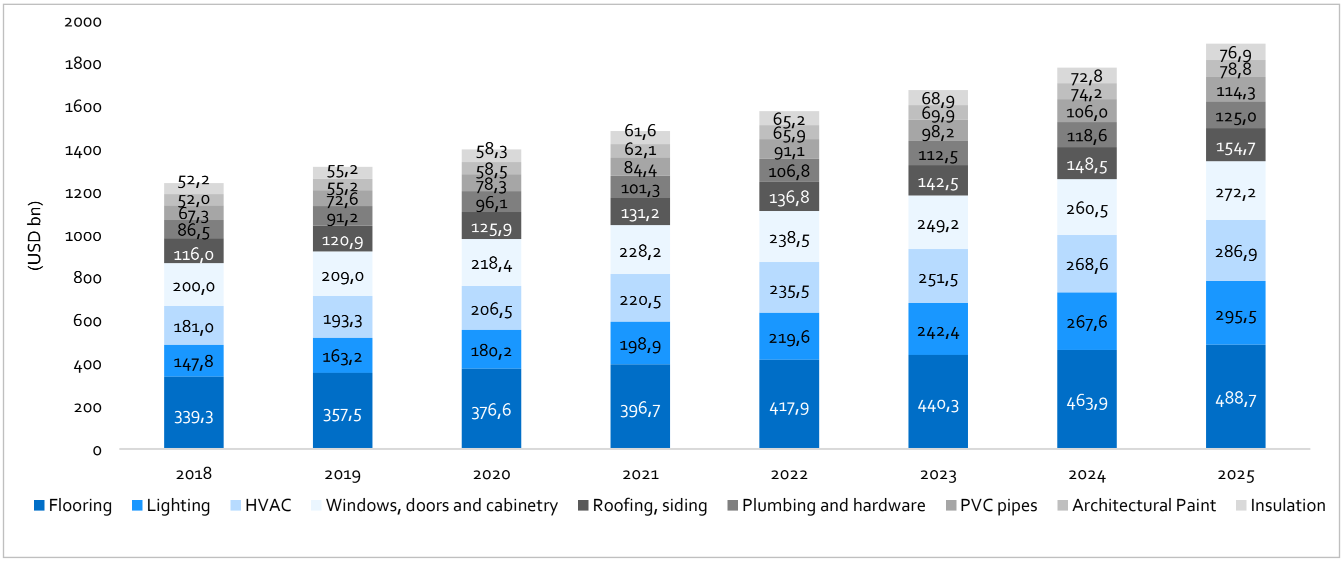
Natural Materials	Synthetic Materials

Industry Overview

Market Overview

The global building materials industry was valued at USD 1.20tn in 2018 and is expected to reach USD 1.90tn in 2025 growing at a Compound Annual Growth Rate (CAGR) of 6.30% during the forecast period (2019 – 2025). Flooring is expected to be the largest segment reaching USD 488.70bn in 2025 growing at a CAGR of 5.35% during 2019 – 2025. Flooring segment will be followed by lighting; HVAC; and windows, doors and cabinetry. However, Lighting is expected to be the fastest growing segment in value terms, growing at CAGR of 10.40% during 2019 – 2025. PVC pipes is expected to be the second fastest growing segment growing at a CAGR of 7.90% during the same period.

Figure 1: Global Building Materials Industry (2018 – 2025)



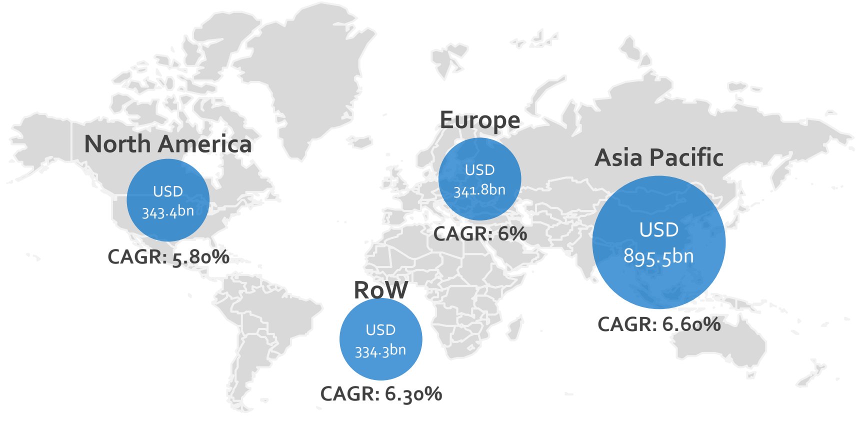
Source: Desk Research

- **Flooring** is the largest segment, which is expected to grow at a CAGR of 5.35% during 2019 – 2025 driven by strong growth in the Asian sub-continent, which continues to remain the largest consumer of ceramic tiles during 2019 – 2025
- **Lighting** is expected to emerge as the fastest-growing segment to grow at a CAGR of 10.40% during 2019 – 2025
  - Such strong growth will be largely driven by fast-pace Light Emitted Diode (LED) segment that will be regarded as the most-promising technology in terms of commercial viability among several kinds of clean technologies
- Further, **PVC pipes** is anticipated to emerge as another potential segment that is likely to grow at 7.90% during 2019 – 2025
  - PVC pipes will witness growing volumes due to an anticipated increase in demand across building, construction, and irrigation sectors, governments' increased focus on rural water management, and growing urbanization

Geographic Landscape

- The **Asia-Pacific** market is expected to hold the largest share (by value) accounting for 47% of the total market in 2025
  - Further, the market is expected to grow at the highest CAGR of 6.60% during 2019 – 2025
  - Flooring is expected to be the largest market within APAC accounting for 25.70% of the market, followed by windows and doors (17.90%)
- **North America** is anticipated to be the second largest market growing at a CAGR of 5.80% during 2019 – 2025
  - Flooring is expected to be the largest market within the North American region, accounting for 24.20% of the regional market, followed by Windows and Doors accounting for 13.70% of the regional market

Geographic Landscape of Global Building Materials Industry (2025)



Source: Industry Reports

- **European** market is estimated to account for 17.80% of the total market, which is almost at par with the North American market
  - However, the European market is estimated to grow at a CAGR of 6%, slightly higher than North America but still trailing the industry's growth rate
  - HVAC is expected to be the largest market within Europe accounting for 17.80% of the regional market, followed by Lighting (17.30%)

Macro Economic Indicators

An Introduction

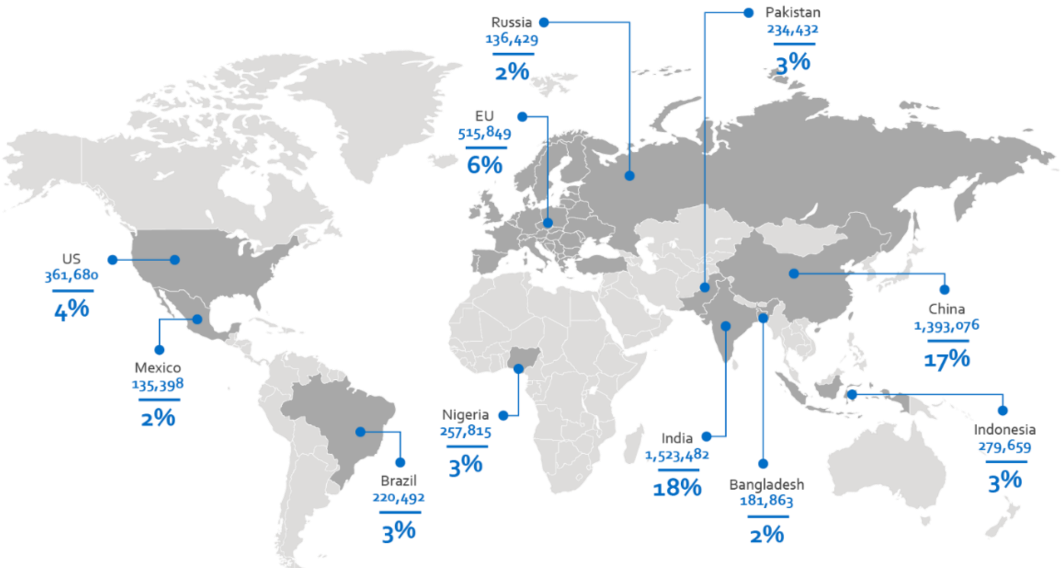
The global building materials industry will be transformed on account of the rise of emerging countries, new consumer classes and resource demand. The shape of the building materials industry will depend on tri-polar interactions between people, economies and demand.

Major industry participants in the industry are anticipated to undertake growth opportunities in the potential regions including the Asia-Pacific and Europe. The industry is expected to continue achieving consolidation in developed markets involving small and regional manufacturers, and distributors. However, factors such as overcapacity, expected sluggish volume growth, and cost pressure will limit the growth prospects in Latin America (LatAm).

Population

According to US Census Bureau, the global population was estimated at 7.60bn in June 2019. China and India were the two most populous countries worldwide collectively accounting for 37% of the world population. The global population is likely to reach 8.50bn by 2030, with 96% of growth coming from developing countries. India will overtake China with the largest population and the largest labor force in the world. Mexico will replace Japan in the top 10 countries by population in 2030. The rise in global population at 45mn annually translates into growing demand for food, water, housing, and in-turn materials industries.

The 10 Most Populous Regions in '000 (2030)



Source: Industry Reports

The Most Populous Urban Regions (2030)

Figure 2: Urban Population by % Share (2010-2030)

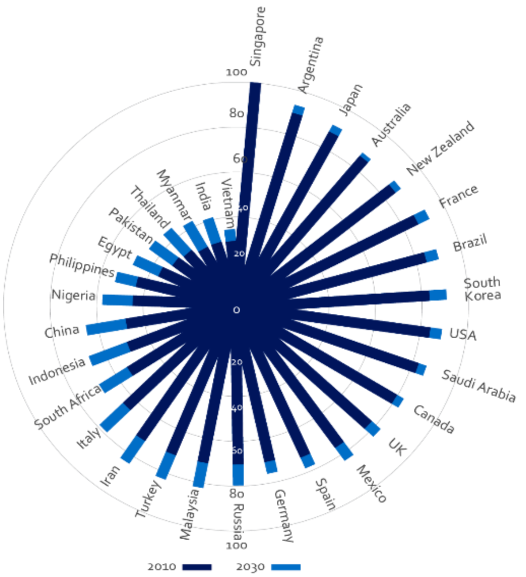
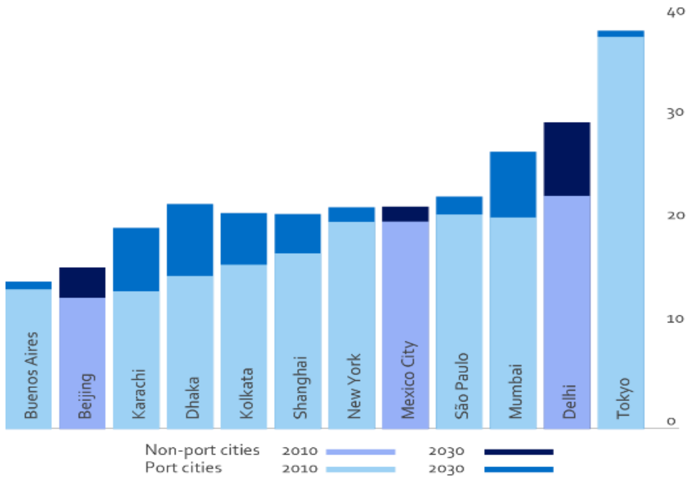


Figure 3: Population of Top Urban Regions (2020-2030)



Source: The United Nations, Lloyd's Register Group

China, Bangladesh, Nigeria, and Turkey will be among the largest countries by growth share (%) in urbanization during 2020 – 2030. The earth's urban landscape is expected to continue shifting towards the emerging nations during 2020 – 2030. Most of the populous cities are located in Asia, Latin America and Africa.

The household size is anticipated to decline as growing number of developing nations are expected to develop residential and commercial sectors and progress in line with the developed countries. Such trend will improve the living standard and extend life expectancy that will increase demand for new housing development. Consequently, the housing market will witness addition of over 800mn homes in case the difference between household demand and population growth occurs globally at ~7-8% over the next 80 years.

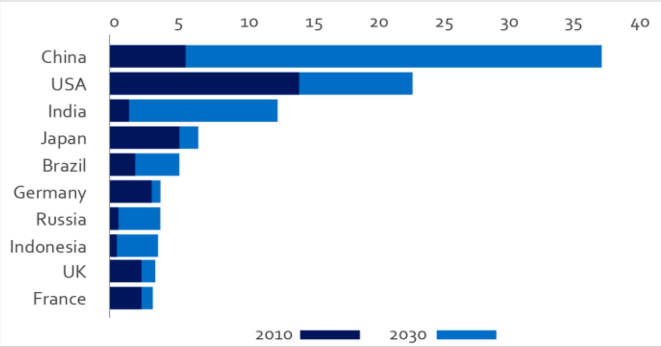
Economy

Countries and regions will continue to compete in the global market. The existing global economic power will be rebalanced by a new league of economies through 2030. These growing economies are brandishing their strengths during the financial crisis to be regarded as a safer place for investment and growth during 2020 – 2030. China, India and Brazil will be ranked among the five largest economies in terms of Gross Domestic Products (GDP) ranking. China alone will contribute about 20% of the global GDP. The traditionally-developed countries, such as the US, Japan and Western European countries, will gradually lose their economic dominance over the next decade.

GDP

In 2030, the world's economy will be led by China and the US including India that will showcase strong growth. China is expected to succeed the US by GDP in the 2020s; however, India is expected to showcase significant growth in the global economic power. India will grow from ninth in 2010 to the top three in the 2020s. The country's GDP will double to that of Japan and more than half of the US by 2030. Additionally, Brazil will join the top 5 and Russia the top 10 in the 2020s. Further, Indonesia is expected to achieve immense growth and ranked among the top 10 by 2030.

Figure 4: List of Countries Ranked by Real GDP in USD Tn (2010 – 2030)



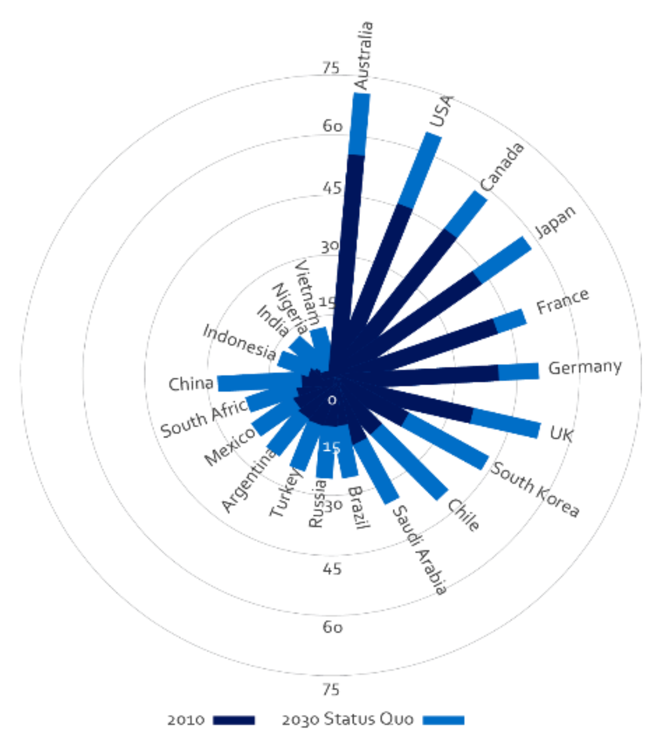
Source: International Monetary Fund, Lloyd's Register Group

GDP Per Capita

The world's GDP per capita will grow faster during 2020s than in the last 20 years. The largest per capita GDP ranks will continue to be filled with highly urbanised developed nations; however, the largest growth in per capita GDP will be taken place in the medium or low-income countries including China, India, Vietnam and Indonesia. The increased income will bolster the demand for residential space, food, consumer goods and infrastructures that will expand trade of building materials industry. Contrary to the favourable market environment, China's manufacturing sector is expected to be under pressure to transform from labour-intensive to higher productivity business; however, such pressure will force the country to develop innovative technologies.

Although many of the emerging economies are projected to overtake the developed countries in terms of overall size and rate of growth, the Emerging 7 (E7) countries still lag well behind the Group of 7 (G7) countries in terms of GDP per capita even in 2050.

Figure 5: Real GDP Per Capita in '000 USD (2010 – 2030)



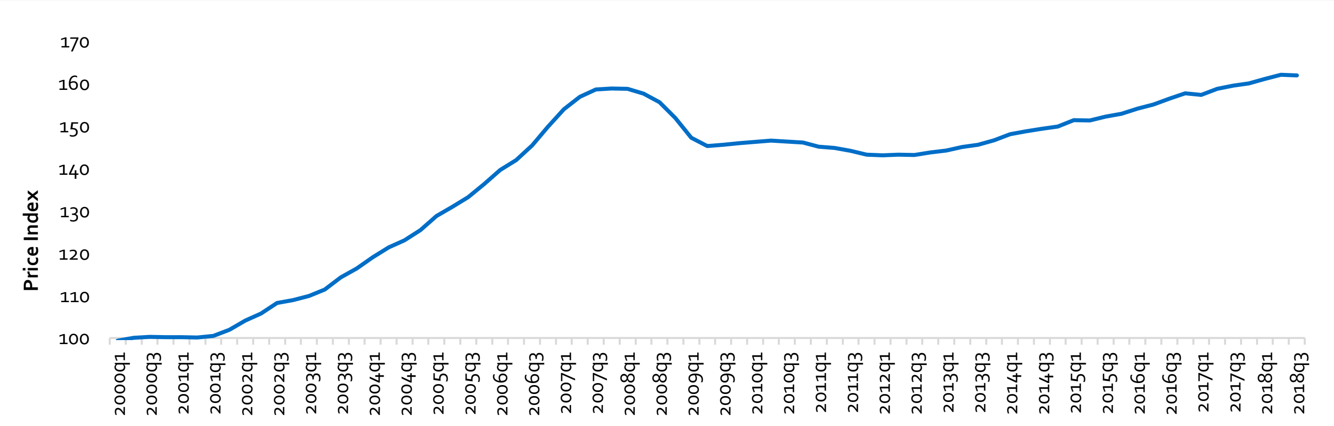
Source: The United Nations, Lloyd's Register Group

Housing Market

Housing prices in the global marketplace have been showcasing unstable movement with the onset of emerging global real estate crisis due to the ongoing trade war and a protracted tariff squabble between the US and China. Such negative market sentiments have compelled central bankers worldwide to entertain the idea of lowering benchmark borrowing costs for stimulating or maintaining economic expansion. In China, the real estate values have gone down significantly due to a decade long housing boom, with buying in the region underpinned by some USD 6.80tn in household debt.

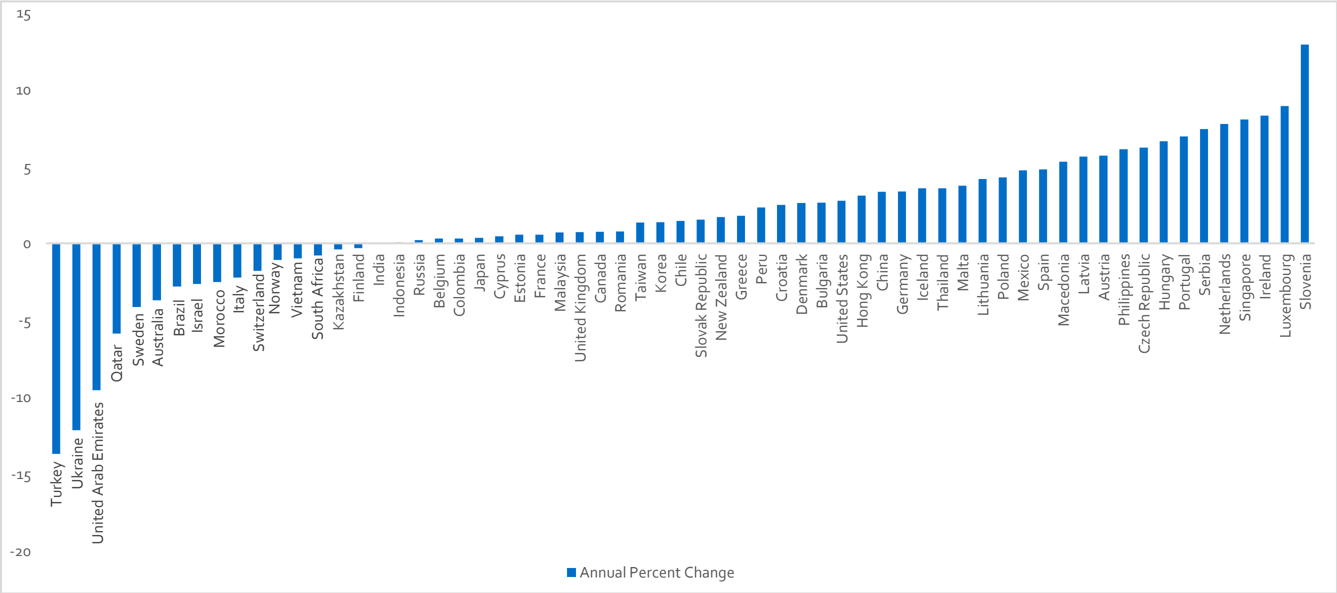
The global housing markets have been steadily climbing up showcasing positive sentiments; however, the near-term outlook of the market remains unpredictable due to the unstable movements in housing prices across various countries. Consequently, the market is anticipated to largely remain flat, while an expected stable growth in the long-run. Moreover, significantly high house price valuations hints to a risk of falling prices in the quarters ahead.

Figure 6: Global Real House Price Index



Source: IMF

Figure 7: Real House Prices Over the Past Year (2018)



Source: IMF

The global real estate sector has experienced an average growth and real house prices have increased over the past year in most countries; however, the near-term outlook remains unpredictable in line with instability in the housing prices across various countries.

International Trade

Intra-regional trade is expected to nearly double by 2030. Currently, the intra-regional merchandise trade is greater than trade between different regions. Contrary to such trends, Latin America, Commonwealth of Independent States (CIS) and the Middle East regions have comparatively lesser intra-trade activities. The intra-regional trade is likely to be promoted on the back of rising trade blocks within more regions for the next 10 years. Global seaborne trade will be dominated by Intra-Far East between – Oceania and Far East, Far East and Latin America, and Far East and the Middle East. Asia will witness the strongest growth within these trade routes transforming into the center stage in the global seaborne trade.

Regional Trade Blocks

The global economies are experiencing the requirement of lesser regional trade blocks. These regional trade blocks are expected to perform a positive role in stimulating trade activities and prosper growth. Regional trade blocks operate efficiently and showcase potential where companies are allowed to integrate with other companies in the region for production, and distribution networks. Such trends create a built-in pressure helpful in forming better coordination at multinational level. The companies find it easier in going global and defining rules of exchange for the future.

Regional Overview

The global real estate sector is showcasing flat growth with regional market corrections. In 2018, the global housing market showcased its underlying potential with growing investments in properties. Such trends are expected to continue further during 2019 – 2020; however, sluggish growth in some regions have offset the positive impact of growing real estate investments worldwide. As a part of global market outlook, investors are likely to explore opportunities to invest in assets overseas that include offices and co-working spaces. Further, residential properties in the potential markets such as Lisbon, and Portugal are anticipated to fetch better yields. During 2019, such trends are likely to continue in the global real estate market and attract investors looking for a safe haven.

Asia-Pacific

Growing Popularity of Co-Living in the Asian Markets Supports Further Growth

The real estate prices in Hong Kong have significantly escalated during 2017 – 2018. High real estate prices have forced young natives in Hong Kong with enough capital to encourage co-living concept as against settling in compact homes. Rooms in such developments are very small as per the American Standards (nearly 100 sq. ft.); however, they are accompanied with modern interiors and modern furnishing. Additionally, presence of communal kitchen and living areas similar to the regular housing pattern make these developments attractive for younger, middle-class renters.

Investing in such complexes are expected to generate better short-term gains and far-fetched results in a rapidly maturing market where these development setups typically include 70 to 160 rooms and rents ranging from USD 900 to USD 1,750 USD per month.

Decline in India's Residential Market

Investments in residential market have continued to decline at an alarming rate between 2016 and 2019 due to a slowdown in the sector, according to Federation of Indian Chambers of Commerce & Industry (FICCI). Liquidity crunch, delayed projects and reduced buyer interest have been the main reasons for decline in the residential market. However, commercial real estate market has remained the most preferred segment for investors during the period of 2015-2019. Availability of grade A commercial space and reasonable rentals coupled with lower vacancy levels in major cities in the country.

North America

US Trade War may Dampen the Potential Demand in the Real Estate Worldwide

The US trade tariffs (ranging from 25-50%) to a wide range of imports including aluminum, and steel is expected to have adverse ripple effects on the targeted long-term trading partners including China, Canada, Mexico, and the EU. The IMF reduces its growth forecast for mid-year 2019 from 3.90% to 3.70%. These regressive market developments are expected to have the potential to adversely impact economic activities and in-turn will affect the property markets worldwide. Consequently, such global trade war is likely to demotivate exporters to ship lesser products to America and discourage importers to buy as they will pay more for their goods. The trade war will reduce the disposable income of buyers worldwide going forward during 2019 that will create a slowdown in sales and stagnate or decline the prices in the vulnerable markets.

Stagnating Property Prices and Rental Boom in America

In 2018, the US housing market witnessed double digit year-on-year price increase due to low interest rates, employment growth, and declining unemployment. Such year-on-year price increase was witnessed in Seattle (13%), Orlando (11%), and Denver (10%).

However, such price growth is likely to slow down on account of the Federal Reserve's plan to increase interest rates twice a year and the Congressional Budget Office's projected decline in GDP to 2.40% in 2019. However, the rental market in the American region showcases a bright future with vacancy rates hovering around 7-7.50% range over the past several years. Further, the affordability crisis will be the main driver behind an expected surge in rental construction. It is estimated that nearly 50% of renters shell out over 30% of their income on housing. Further, the immigrants, and cash-strapped millennials are exerting upward price pressure on the existing market. Such trends are creating a favorable market environment for rental construction during 2019.

Higher US Interest Rates will Diminish Other Property Markets

Higher interest rates kept by the Fed in the US is expected to decline the demand in the real estate sector in the global economy. The homeowners and buyers experience the additional burden of increased interest rates in the US and the international markets. it's not just homeowners and buyers that feel the squeeze. Several jurisdictions worldwide have adopted the US dollar or peg their currency to US dollar. Consequently, it increases the cost of borrowing money in these places every time the Federal Reserve increases interest rates. For instance, Hong Kong is considered as significantly expensive real estate market due to its significant exposure towards US dollar.

Europe

European Construction Growth is Estimated to Slow Down during 2019 – 2020

Broadly, the European markets continue to gradually recover; however, keeping slow-pace growth pattern and lower GDP growth of ~2.30% in 2018 that may further decline to 1.70% during 2019 – 2020 as against 2.80% in 2017. Such declining GDP growth is expected to negatively impact the construction market and construction sector may no longer be the growth engine in the European region. Additionally, an expected growth deceleration of new housing construction will shift to civil engineering construction, reflecting some infrastructure renovation programs announced in continental Europe.

The broader regional growth forecast of the European construction sector is positive; however, significant differences at the country level is anticipated to considerably offset such positive trends. Collectively, the Eastern Europe is expected to post comparatively higher growth than the Western Europe on average.

Impact of No-Deal Brexit

The aftermaths of Brexit deal are expected to become decisive for the fate of the real estate industry during 2019. Long-trailing Brexit deal is anticipated to transpire as revolutionary development creating significant impact in the global real estate markets worldwide. A no-deal Brexit may disrupt the supply chains that may lead to major lay-offs across businesses. According to Capital Economics, the real estate prices are likely to plummet by nearly 47% with a bleak residential price outlook. However, no-deal Brexit will also create an opportunity for foreign investors, which may increase investments from the global markets.

An Early Departure by EU Nationals and Firms during Pre-Brexit may Spur Property Uptick

Certain real estate markets in the EU are expected to foresee a short-term benefit due to their pre-Brexit departure from the UK market. According to the Guardian, over 132,000 EU workers left their jobs in the UK during 2017 and settled down in their home countries in the Central and Eastern Europe. The sudden movement of EU nationals in their home countries will enhance the demand pattern and encourage increasing investments in Warsaw, Bucharest, or Budapest.

Lisbon May Prosper as the Property Investment Capital of Europe in 2019

According to PwC, Lisbon has been considered as the real estate capital of Lisbon and the entire Europe in 2019 due to the surging economy, increased tourism, and prices, which are comparatively lower than other wealthier European countries. Cheaper land prices in outlying areas will translate into increased investment activities in the real estate sector in the country. Going forward, 2019 is considered as an apt time for investments since the rental yields are ranging between 5.40 – 6.70% in the country; however, prices are expected to escalate dramatically in the coming years.

Persistently low oil prices to weigh on Russian markets

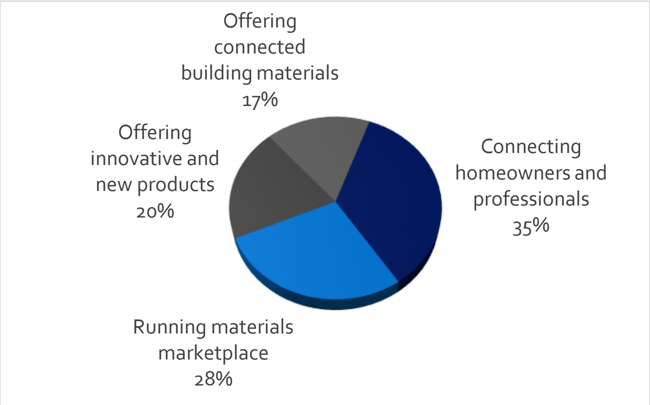
Continuous decline in the oil prices worldwide is anticipated to negatively impact real estate sectors across the countries dependent on the oil and gas activities. The governments worldwide are focusing on gradually phasing out from Internal Combustion Engine (ICE) vehicles and developing alternative energy industries. Such developments are expected to have adverse ripple effects on the countries relying heavily on the conventional energy sources such as oil and gas. For instance, Venezuela is likely to be severely impacted due to its excessive dependency on oil and gas. Further, Russia is anticipated to witness similar pain since oil makes up nearly 16% of its GDP. Over dependence on oil has stagnated the real estate prices in the country, which is likely to swell further during 2019 in the Russian Federation.

Industry Trends and Growth Drivers

Digitalization: Building Materials Industry are Forging a Digital Path to Homeowners

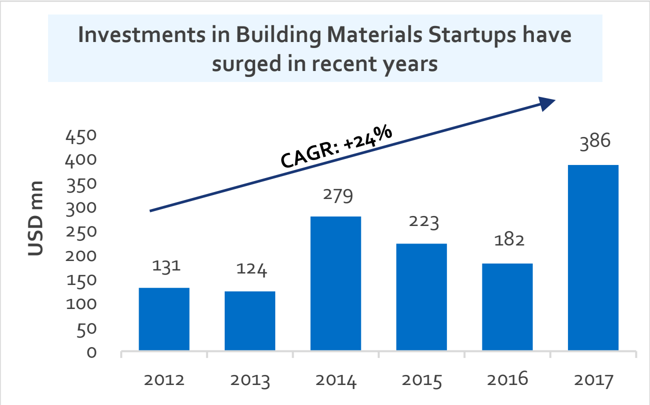
Digitalization is keeping pace in the lighter building materials manufacturing industry. Such changes, in addition to growing competition and opportunities, is encouraging building materials manufacturers worldwide transform their business model. Digitalization is helping market participants to directly connect with end customers, and leverage on the growing opportunities to sell to wholesalers and merchants through online platforms. Fast-pace growth and acceptance of digitalization is allowing material manufacturers to introduce a customer-facing online presence.

Figure 8: Startups' Main Business



Source: IMF

Figure 9: Global Investments in End-Customer-Oriented Building Materials Startups



Source: IMF

Building Materials Manufacturers have Initiated Creating an End-Customer-Focused Online Presence

Braas has Monier built an online platform to connect end customers with roofers through an online platform, MeinDach ("My Roof")

- In 2017, MeinDach supported the sale of roofs to more than 100 homeowners, about five times the yearly average for a typical German roofer
- During the same time, the company's customer acquisition costs—expenses related to promoting the service and converting shoppers into buyers—significantly dropped per homeowner

Thermondo, a venture-backed startup operating in the home-heating-systems service business in Germany, captured a substantial share of the German market. In 2017, the company introduced a heating-as-a-service offering called Thermondo 365, which is coordinated through its website and has grown to account for ~30% of its business

For Xella's first B2C digital initiative, the European wall-building materials producer created a free virtual companion for private homebuilders to drive traffic and awareness and sell products directly to consumers

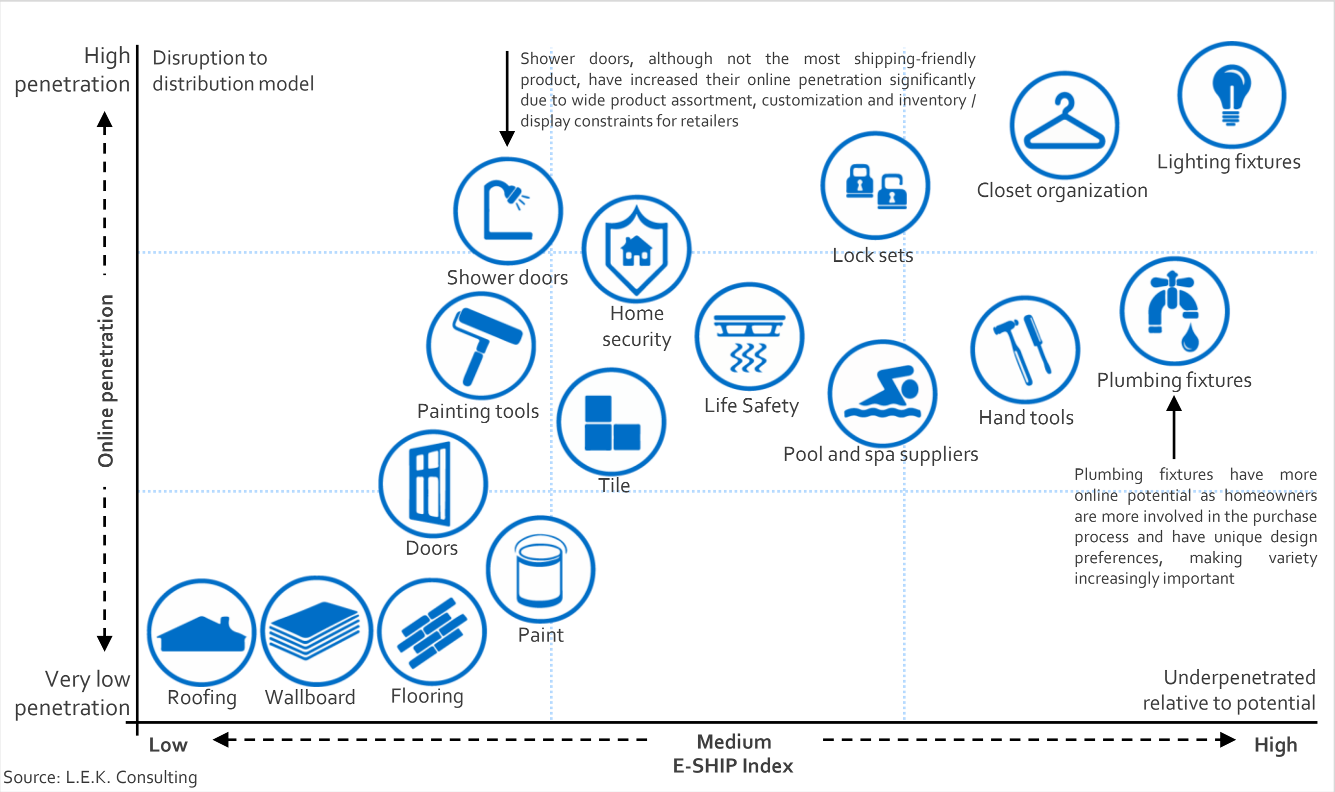
- Xella has created a Building Companion website as an online project management center for people interested in remodeling or building their own homes in Poland, as ~50% Polish homeowners act as their own general contractors for new home projects
- The introduction of website supported the company's growth objectives through working with ~60 architects, ~30 contractors, and ~50 merchants in the region of Poland where it was initially available and registered a steady increase in traffic to the site

E-commerce is Poised to Disrupt Building Products Market in the Home Improvement Industry

E-commerce in the home improvement industry is showcasing significant potential to disrupt the entire value chain. So far, the e-commerce is not witnessing the similar penetration in residential building products as it is in consumer products. However, the e-commerce penetration among contractors is showcasing continuous growth where the actual penetration is significantly higher as compared to the historical market trends. The incumbent players including manufacturers and retailers/distributors are capitalizing on the underlying opportunities.

According to L.E.K. Consulting's annual contractor survey, millennial contractors reported 50% higher purchasing online versus non-millennial contractors in 2017 indicating growth in the millennial contractor generation. Additionally, homeowners are increasingly "empowered" in their decision-making and prefer internet platform for product choices, design advice, feedback and installation support. Such favorable market trends are encouraging industry leaders in the residential building materials to get in front of the opportunity and challenge. The major manufacturers are investing in downstream demand-generation ecommerce tools while paving the way for direct-shipment. Further, distributors including pro and big box, are investing in capabilities to become multi-/omni-channel.

E-SHIP E-Commerce Framework for Building Materials



Source: L.E.K. Consulting

Key Example of E-Commerce Disrupting Building Materials

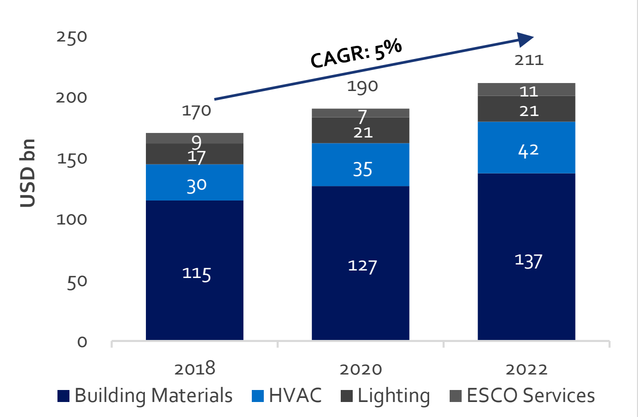
Since launching its B2B ecommerce unit, Amazon has realized a fivefold increase in home improvement revenues, from USD 1bn in 2011 to ~USD 6bn-plus in 2018, with some 13mn stock keeping units (SKUs) across 15 home improvement categories, including ~3mn building material SKUs. Sales of small tools, lighting fixtures and other DIY-oriented products have grown most rapidly.

- Amazon's rapid ascent underscores the growing receptivity to online merchandising

Smart Buildings will Drive Demand for Energy Efficient Building Materials

Continuous growth in smart buildings is creating opportunities for energy-efficient building materials across three segments: energy-efficiency, building automation, and connected home. Growing emergence of these segments is expected to expand the smart buildings market, which in-turn will benefit the building materials industry. In 2018, these three segments generated global annual revenue of USD 250bn, and are expected to collectively reach about USD 339bn by 2022, divided fairly evenly among the US, Europe, and the rest of the world. Any convergence of the energy efficiency, building automation, and connected homes market segments is bound to positively affect the building materials industry. Although the full extent of the impact remains unclear, it will certainly be significant enough to drive the market further.

Figure 10: Energy Efficient Building Materials Industry



Source: Boston Consulting Group (BCG)

Energy-efficient building materials—including windows, roof tiles, insulation, and facades—already make up about 70% of the energy efficiency segment.

Building Materials Manufacturers are Focusing on Energy-Efficient Building Products and Systems

- In Jul'19, Energy Efficiency Services (EESL), an Indian government enterprise, introduced India's most energy-efficient air conditioner that have been developed by Voltas, in a bid to reduce emissions and keep the country's electricity demand in check
- The company anticipated the deployment is expected to save 145.50mn kilowatt-hours of electricity per year and will be helpful in migrating nearly 120,000 tonnes of carbon dioxide annually.

In Oct'18, Signify, formerly Philips Lighting, announced the launch of Interact Pro, a multi-tasking, smart lighting system and software for commercial offices. Interact Pro is an intuitive app and dashboard that lets users select the right light to suit their eyesight, task and the time of day to improve productivity and well-being while reducing energy cost.

Synavax launched Healthy House Paint which provides the multiple benefits including lower energy bills, protection against mold growth, zero volatile organic compounds (VOCs), fade resistance and stain resistance. The paint uses nano-engineering technology to reduce heat transfer, insulating interior and exterior walls, ceilings and attics to lower heating and cooling costs and make homes more energy efficient in all seasons and climates.

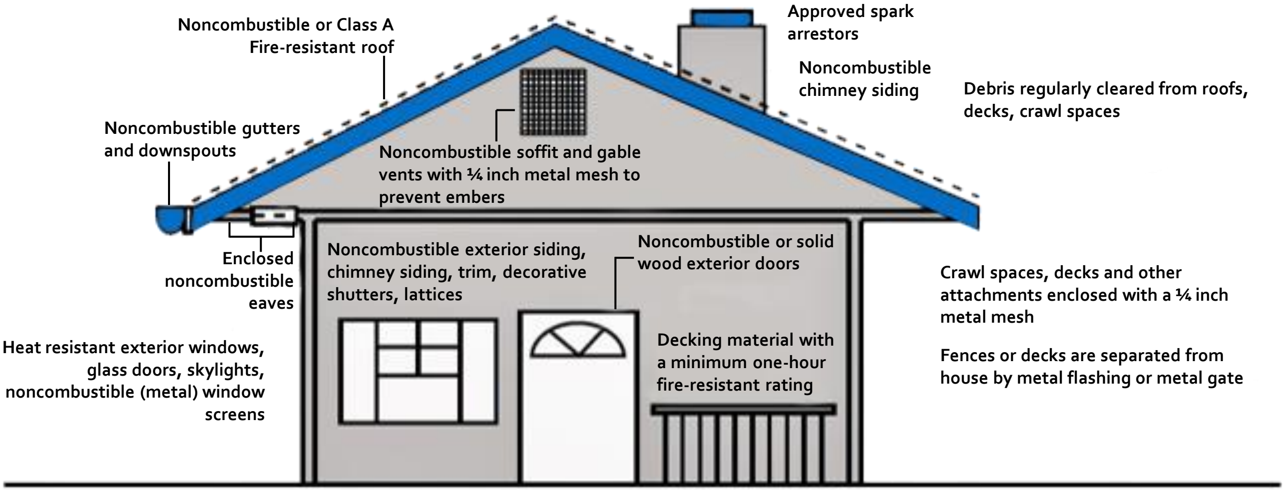
Emphasis On More Resilient Building Materials

During 2017, the US suffered over USD 306bn in damage from natural disasters, making it the most expensive year for disasters in US history. Additionally damage estimates for 2018 were around USD 91bn. Such disasters are forcing residential and commercial building manufacturers to explore alternative materials, which are durable, and resilient. These stronger, and sturdier building materials, are expected to better withstand damage from natural disasters such as fires, earthquakes and floods.

Resilient Building Products can be used for protection against natural calamities:

- **Wind (Tornadoes and Hurricanes)** – Fortified construction may begin with small items such as hurricane clips that tie wall framing to floors and foundations, and roofs to walls, and could go on to include storm resistant siding, window shutters or even impact resistant glass and roofs
- **Earthquakes** – Earthquake resilience is primarily life safety protection and only secondarily asset protection. Protective measures range from simple shear walls or, braced frames, to moment resisting frames (now even possible in wood construction with the help of connecting steel devices), diaphragms to the construction of base isolation or energy dissipating devices such as various kinds of dampers
- **Floodwater Protection** – For protection, whole buildings or at least their habitable spaces need to be elevated above the critical flood levels plus some free board. Foundations have to be secured against water forces and all building materials subjected to flood waters need to withstand those impacts
- **Fires** – Fire fortification could be in order for any building close to other buildings or trees in an era where extreme drought conditions are rapidly spreading to areas typically not accustomed to droughts. Protective measures include non combustible roofs and siding, fire barriers and fire breaks. Windows are a weak spot and need to be protected with exterior shutters or fire resistant awnings.

Building Features to Reduce Wildfire Risk



Source: Definitive Research Partners

Segment Analysis

Key Product Categories

Windows, Doors and Cabinetry
Residential Windows & Doors
Commercial Windows & Doors

Plumbing and Hardware
Bathroom Fixtures
Kitchen Fixtures
Hardware & Security

PVC Pipes
Chlorinated PVC Pipes
Un-plasticized PVC Pipes
Plasticized PVC Pipes

Heating, Ventilation, and Air Conditioning
Boilers
Heat Pumps
Furnaces
Fan Systems
Chillers

Lighting
Traditional Lighting
Smart (LED) Lighting

Flooring
Ceramics
Resilient Flooring
Wood & Laminate
Carpet

Roofing and Siding
Concrete
Metal
Tiles
Asphalt (Bitumen)

Insulation
Glass Wool
Mineral Wool
EPS
XPS

Paints and Coatings
Architectural Paint

Windows & Doors

- Residential Windows & Doors
- Commercial Windows & Doors

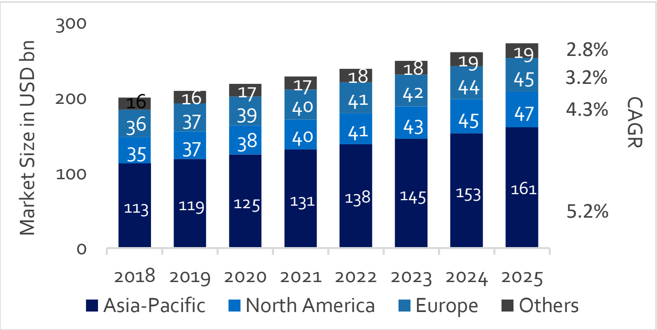
Market Overview

The global windows and doors market is estimated to reach USD 272.17bn by 2025 from USD 200bn in 2018. Factors such as focus on advancements including eco-friendly windows & doors, growth in commercial and residential buildings, and increase in spending on home remodeling in developed economies is supporting strong growth in the windows and doors market.

The global windows and doors market is expected to grow at a CAGR of 4.50% during 2019 – 2025.

Regional Overview

Figure 11: Windows & Doors Market Size by Region (2018 – 2025)



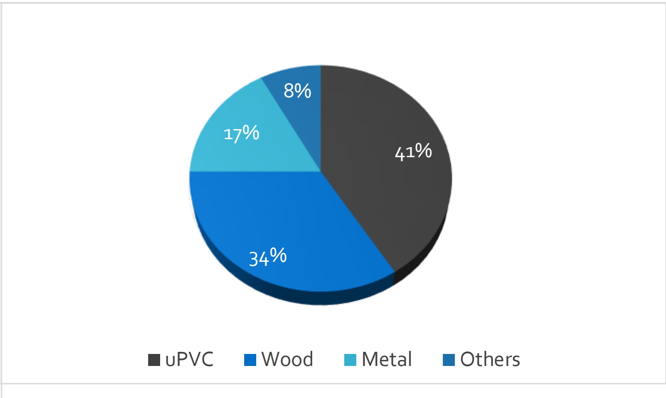
Source: R+T Asia

- **APAC** is expected to remain the largest market and witness the highest growth over the forecast period due to growing population and increasing construction activities in this region
- Improved government finances in emerging economies including China, Malaysia, Indonesia, India and Thailand is expected to witness rapid expansion in residential construction to fulfill the growing population needs
- The North America is expected to showcase significant growth bolstered by strong growth in the US and Mexico in the long term, despite short term headwinds

Product Overview

- **Metal windows and doors** is expected to remain the largest segment during 2019 – 2025 due to durability and low cost option as compared to other materials
- However, the **plastic door and window** segment is anticipated to witness the highest growth on the face of superior energy efficiency, durability, and low maintenance cost
- Residential segment is expected to remain the largest end-use segment and to witness the highest growth during 2019 – 2025 due to the increased residential spending and higher disposable income

Figure 12: Windows and Doors Market by Product Type (2025)



Source: Global Market Insights Inc.

Windows & Doors | Plumbing & Hardware | HVAC & Lighting | Flooring | Roofing, Siding & Insulation | Paints/Coatings

- Rising infrastructure development activities worldwide are expected to boost the global windows and doors market. New construction of houses owing to strong government support in lowering taxes and interest rate positively impacting product demand
- Unplasticized Polyvinyl Chloride (uPVC) windows and doors market segment is expected to be the largest material type worldwide due to increasing demand for lightweight, low cost, and energy-efficient products are the major factors instigating product adoption
    - uPVC product range provides advanced insulation that are allowing to save energy in eco-friendly houses and buildings propelling windows and doors market

Product Categories

Residential Windows and Doors

Residential windows and doors market is expected to account for over 60% of the total market and is anticipated to reach USD 140bn by 2024.

Commercial Windows and Doors

Commercial windows & doors market sector is projected to register over 3.50% CAGR up to 2024. Rising development activities for new construction of commercial buildings include schools, hospitals, and industries will expand product demand.

Key Players

- Global windows and doors market is highly fragmented with presence of large number of regional and international players
- Technological innovation by market players producing ecofriendly windows and doors is expected to propel the market growth
- Key market participants are focusing on acquisitions and new product launch to capture a larger market share and increase their customer base
    - For instance, Jeld Wen Inc. and Pella Corporation have acquired other market players to sustain the intense competition in the market

MASONITE.	Integrated Doorsets	Fenesta Better by Design	YKK ap
Pella	JW JELD-WEN WINDOWS & DOORS	inwido	Andersen AW CORPORATION

Industry Opinion

"North American single-family permits and housing starts through the first half of 2019 were lower than we anticipated, leading to a weaker residential new construction demand relative to our initial expectations. We believe the key drivers of new home construction all align favorably over the long-term."

- Gary S. Michel, President, CEO & Director, JELD-WEN

"Europe segment demand was flat during the first half of the year and varied by region. We experienced the weakest demand in Northern and Central Europe, which account for the majority of segment revenues, and the strongest demand activity in the U.K. and France. In Australasia, our expectation at the beginning of 2019 was for a gradual deceleration in housing activity throughout the year. However, new home construction deteriorated at a faster rate than anticipated, particularly late in the second quarter. Australia's Housing Industry Association, or HIA, now forecasts a 17% decrease in housing starts for the year compared to expectations of an 11% decline"

- Gary S. Michel, President, CEO & Director, JELD-WEN

"The industrial market, particularly in geographies in Sweden and Finland, has continued to soften and has obviously impacted the larger units there. We've seen that the total window market in Sweden has actually decreased 4 consecutive quarters ... e-Commerce continues to grow in all our geographies, and with our position that creates an opportunity for us obviously. The U.K., given the Brexit uncertainty, continues to be challenging."

- Henrik Hjalmarsson, President and CEO, Inwido

"Housing completions hit their lowest level in 15 months. While we still believe there are healthy fundamentals in the U.S. housing market, it's hard to predict how long these slower market conditions will persist."

- Frederick J. Lynch, President, CEO and Director, Masonite Corporation

Outlook

- The future of the global door and window market in the long run looks optimistic with opportunities in the commercial and residential sectors. Construction industry growth across commercial and residential buildings is expected to bolster the windows and doors market size
- Further, factors such as increasing new construction, renovation activities, and rising consumer spending on home improvement is expected to support market growth during 2019 – 2025
- Increasing use of impact resistance windows and doors, and development of energy saving windows and doors will transform the dynamics of the market

Commercial windows & doors market sector is projected to register over 3.50% CAGR up to 2025.

Plumbing & Hardware

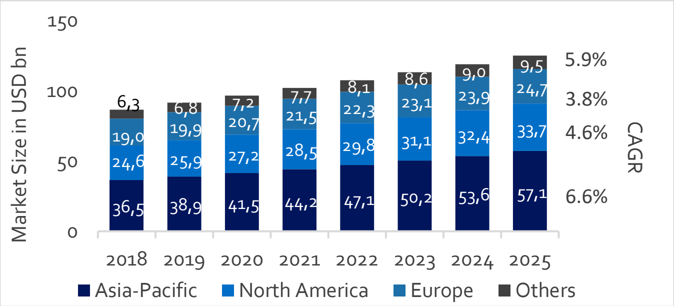
Market Overview

The Global Plumbing and hardware market was estimated at USD 86.50bn in 2018 and is expected to reach USD 125bn by 2025. The market is driven by rise in urbanization, change in lifestyle and increase in disposable incomes of consumers, and heavy investment in smart homes. Moreover, rise in construction facilities in countries of Asia-Pacific is expected to drive market growth. Introduction of various new systems including water efficient systems are expected to create lucrative opportunities in the plumbing fixtures market.

The global plumbing hardware market is expected to grow at a CAGR of 5.40% during 2019 – 2025.

Regional Overview

Figure 13: Plumbing Hardware Market Size by Region (2018 – 2025)



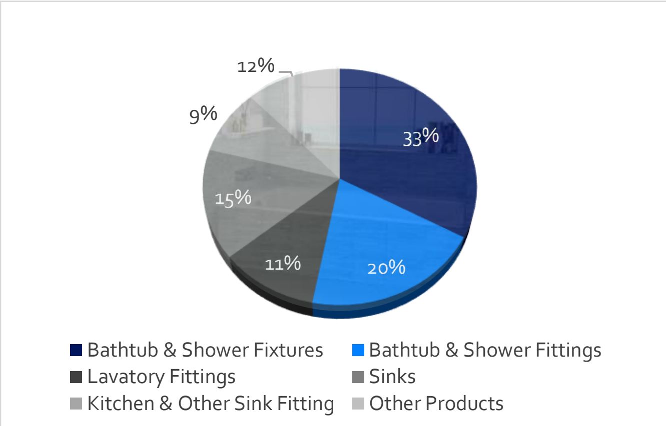
Source: TechSci Research

- **Asia Pacific** will have a significant share in the global plumbing hardware market followed by its favorable investment policies in countries such as China and India. APAC is expected to register the fastest CAGR of 6.60% during 2019 – 2025
- APAC is expected to be followed by North America, which will be the second-largest market for plumbing fixtures & fittings followed by RoW and Europe

Product Overview

- The **bathroom fixture segment** accounted for 83.60% of the overall market share in 2017 and is likely to retain its dominance through 2025
- Among end-users, the **residential segment** is likely to hold the largest market by revenue through 2025 by growing at a CAGR of 6.30% during 2019 – 2025
- Growth in plumbing hardware segment is driven by rising construction of residential buildings leading to increased installation of luxurious fixtures such as rain, handheld, and ceiling showerheads
- However, based on the fixture types, Kitchen fixtures segment is expected to grow at the fastest CAGR of 7%

Figure 14: Plumbing Hardware Market by Product (2025)



Source: Deutsche Bank, Freedonia

- Growth in construction of residential buildings is leading to increased installation of various luxurious fixtures such as rain showerheads, handheld showerheads and ceiling showerheads, thereby driving the growth of the segment

Growing preference for modern washroom and kitchen fixtures among the urban population is supporting growth in the market segment. Further, growing popularity of ceramic materials in sanitary ware on account of their excellent heat tolerance characteristics has influenced the working-class population to spend on beautifying washrooms and kitchens. Key plumbing fixtures that are expected to lead the global market through 2023 include bathtub, sinks, toilets, showers, faucets and taps, and drains.

Product Categories

Toilet Plumbing

- Toilet plumbing fixtures accounted for a share of more than 20% in 2018 due to the growing focus on personal hygiene worldwide
- Faucets and taps are expected to be the fastest growing segment with a CAGR of 5.70% for 2019 - 2025 owing to the modern urban lifestyle, along with smart, upgraded, and visually appealing product innovation by market participants

Hardware and Security

- The hardware and security segment includes various products such as entrance systems for physical access, electronic access and data, mechanical key systems and lodging systems
- Electromechanical products have increased from 20% to 50% of sales in 10 years for Assa Abloy, illustrating the growing market size for hardware and security products in the building industry

Key Players

- The plumbing hardware market is fairly concentrated, with the top 3 plumbing manufacturers accounting for around 50% and top 5 for around 50 – 70% of the market
- Moen (part of Fortune Brands) is the largest player in the faucets and shower heads market by holding over 30% of the total market, while Delta (part of Masco), and Kohler are other two major players worldwide
- Since the raw materials used are commodities, they are available from various sources with pricing being determined by market forces. As a result the plumbing manufacturers have more pricing power than their suppliers and customers

Fortune Brands A home and security company	MASCO	KOHLER.	LIXIL
TOTO	Spectrum Brands	Richelieu	dormakaba
legrand®	GERBER.	Darice®	TYMAN PLC

Industry Opinion

"The market environment in the major regions of North America, Europe and Asia, has not changed significantly since the beginning of 2019. We believe there will be, in principle, a good market environment in North America and a moderate market environment in Europe, while the market environment in Asia will remain good. We still think political conditions are volatile and uncertain, as our ongoing negotiations between the U.S. and China as well as Europe."

- Bernd Brinker, CFO, dormakaba

"The China market is in the midst of a transformation to a consumer-driven economy. Previously, 70-80 percent of demand was for large projects where government or big developers were driving the demand instead of consumers. The market has now become more consumer-driven and demands innovation that can solve real-life problems. Consumers want products and technologies that have real purposes and real functions."

- Bijoy Mohan, CEO, Lixil Asia-Pacific

"Consistent with many industry forecasters we expect the repair and remodel market to grow in the mid-single digit range in 2019. For new construction, we are assuming a low single-digit growth rate due mainly to labor constraints and affordability concerns understanding that recent declines in mortgage rates could help alleviate some of the affordability pressure."

- Keith J. Allman, President and CEO, Masco

Outlook

- The introduction of water efficient fixtures and plumbing technology such as low flow faucets, sensors and dual flush toilets has helped in fresh water conservation that will support growth in plumbing hardware market across residential buildings worldwide
- The plumbing and hardware market is expected to showcase significant growth on account of fast-pace bathroom renovations and willingness to spend on high quality fixtures
- The residential and non-residential sectors are witnessing growing replacement of old traditional fixtures with efficient fixtures, which is fueling the growth of the plumbing fixtures market
  - The introduction of water efficient plumbing and fixtures technologies such as sensors, dual flush toilets, low flow faucets has enabled the end-users in conserving fresh water to a large extent

Rise in the disposable income of consumers is anticipated to increase their spending on efficient fixture products.

PVC Pipes

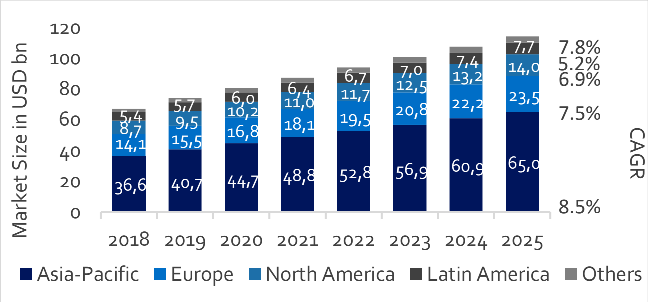
Market Overview

The global Polyvinyl Chloride (PVC) pipes market was estimated worth USD 67.30bn in 2018, and is expected to reach USD 114.30bn by 2025. Surging demand for pipes across building and construction industry and irrigation sector, increasing focus of government on rural water management and growing urbanization have fueled the growth of the global PVC pipes market. Further, PVC pipes are gaining momentum worldwide on the face of light-weight properties, cost-effectiveness, and easy installation and durability.

The global PVC pipes market is expected to grow at a CAGR of 7.86% during 2019 – 2025.

Regional Overview

Figure 15: PVC Pipes Market Size by Region (2018 – 2025)



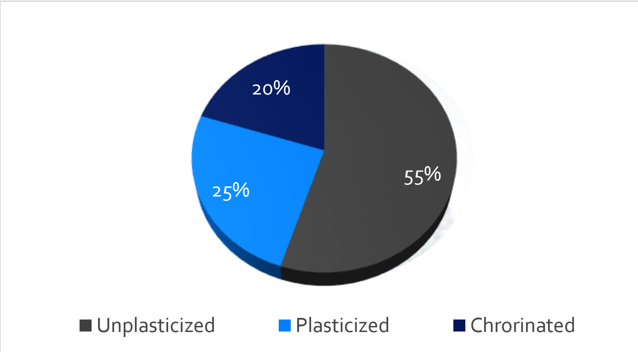
Source: IMARC Group, Ceramic World Web, Polaris Market Research, CPMA India

- Geographically, the market is spread across two key markets: Asia-Pacific, and North America
- **Asia-Pacific** is expected to be the largest PVC pipes market through 2024 including China being the largest producer and consumer
- Growing demand for agriculture, housing, building & construction in China, India, and Indonesia has boosted the global PVC pipes market demand
- Further, huge demand in various application such as sewerage, plumbing, water supply, and irrigation are expected to drive the PVC pipes market growth
- Europe ranks second in the market; however, Europe is keeping a slow-pace growth, while the African region is not expected to receive considerable volume on the face of prospects for the construction sector and adverse agriculture scenario

Product Overview

- uPVC dominated the PVC pipes market; however, Chlorinated polyvinyl chloride (CPVC) pipes are anticipated to showcase the fastest growth in terms of production over the assessment period
  - Growing adoption of CPVC pipes over PVC or galvanized pipes due to its widespread application in the household sector will lead to the growth in the PVC pipes market through 2024
- Rapid urbanization and growth of the industrial sector are anticipated to drive the global PVC pipes market

Figure 16: PVC Pipes Market by Product (2025)

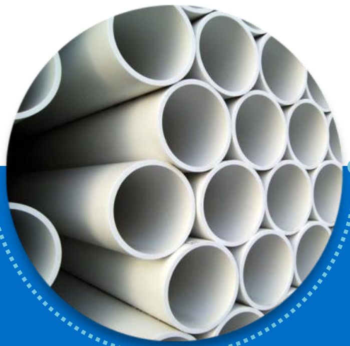


Source: IMARC Group, Ceramic World Web, Polaris Market Research, CPMA India

- PVC pipes are being increasingly preferred owing to their chemical resistance, durability, low cost, and recyclability
- PVC pipes have replaced the metal, concrete pipes in the household, as well as industrial sector, owing to their corrosion and flame resistance, cost-effective, easy installation, and long service life properties

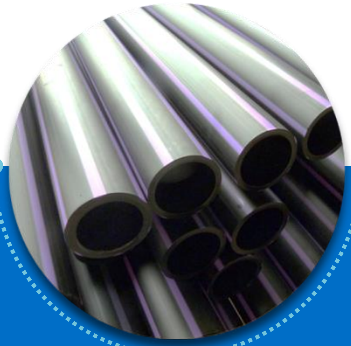
PVC pipes are being increasingly preferred in the plumbing applications owing to their durability, low cost and easy to install properties. PVC pipes for the plumbing application is expected to emerge as the largest segment in the global PVC pipes market with USD 22.78bn in 2017. However, water supply segment is expected to propel further to attain the highest CAGR of 9.92% during 2019 – 2025 on the face of rapid urbanization and rising investment on the water distribution projects in the developing economies worldwide.

Product Categories



Chlorinated PVC Pipes

Increasing safety regulations, increasing use of fire sprinklers, and shift towards the use of relatively cheaper CPVC pipes worldwide are expected to drive the growth of global CPVC through 2025



Un-plasticized PVC Pipes

uPVC pipes, having strong resistance against chemicals, sunlight, and oxidation from water, are being widely used across various applications including water supply, sewer systems, cable conduits, and agriculture sectors

Key Players

- Major firms are increasingly focusing on launching newer and innovative products to effectively compete and increase their market footprint. These new pipes are the world's first antimicrobial range of traps, connectors and waste PVC pipes
- Additionally, India has emerged as one of the fastest growing market for the PVC pipes. Thus, to effectively meet the demand, major firms are increasingly focusing on augmenting their production capacities

LESSO 联塑	ASTRAL PIPES	Polypipe	ADS	AMANCO
NATIONAL	egeplast	FinOlex INDUSTRIES	TIGRE	IPEX by aliaxis
North American Pipe Corporation	PIPELIFE	ROYAL Building Products	SEKISUI	Supreme People who know plastics best

Industry Opinion

"So piping demand was overall good for the industry. It is not restricted to only Astral. I'm sure the other organized player will also grow in this difficult time. So it was the overall growth in the piping. Mainly, it is very difficult to understand the exact reason for the growth. But I think the shift is taking place from unorganized to organized sites. So that can be one of the bigger reasons, which we are foreseeing."

- Sandeep Pravinbhai Engineer, MD & Executive Director, Astral Poly Technik

"The federal government is committed to spending USD 1tn to upgrade the nation's infrastructure, yet it's estimated that USD 2tn is needed for new water and sewer pipes alone. Since PVC pipe can be up to 70 percent less expensive than iron pipe, lasts longer with greater pumping efficiency, it's the best choice to replace America's drinking water systems."

- Bruce Hollands, Executive Director, PVCPA

"In UK residential market, CPA [Construction Products Association] and it's summer forecast recently have forecasted for new House build to be 0.6% lower in 2019. And RMI [Repair, Maintenance & Improvement] to be a little bit more down in '19 at 1.5%. The commercial market in the U.K. is forecasted to be 6.9% lower in 2019. But within that positive for hotels, positive for warehousing and high wide rise residential, not so quite for offices and retail"

- Martin K. Payne, CEO and Executive Director, Polypipe

"India will become world's third largest construction market by 2025, adding 11.50mn homes a year to become a USD 1tn market"

- GCP and Oxford Economics

Outlook

- The building and construction segment is anticipated to hold the largest shares of ~21.30% in the global plastic pipes market by 2024
- Asia is expected to be the largest contributor towards the growth in PVC market on the face of significant growth in the Indian uPVC pipes industry
    - The Middle East and Africa is anticipated to be the fastest-growing region for PVC
- Backward integration by European manufacturers and increase in acceptance by Indian builders and architects is bolstering the sector
- Further, the introduction of water efficient fixtures and plumbing technology such as low flow faucets, sensors and dual flush toilets has helped in fresh water conservation that will support growth in plumbing hardware market across residential buildings worldwide

The water use and water withdrawal segments are projected to witness substantial growth in the global plastic pipes market.

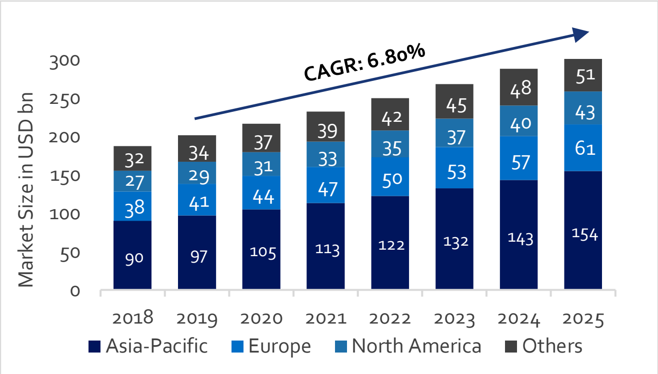
Market Overview

The global heating, ventilation and air-conditioning (HVAC) system market was valued at USD 181bn in 2018 and is expected to reach USD 286.86bn by 2025. Factors driving the growth of the market include increasing demand for HVAC systems for reducing energy consumption, extreme weather conditions, and government tax credit and rebate programs. In terms of application, commercial segment is expected to hold substantial share in the global HVAC market during 2019 – 2025.

HVAC system market is expected to grow at a CAGR of 6.80% during 2019 – 2025.

Regional Overview

Figure 17: HVAC market size by region (2018 – 2025)



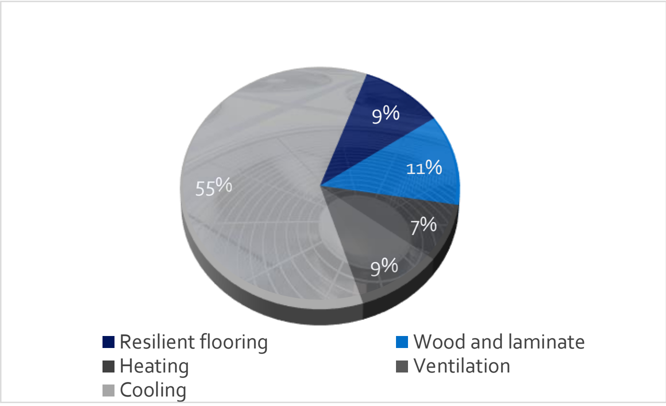
Source: MarketsandMarkets, issuu, BCC Research

- The Asia-Pacific region is expected to grow at the highest CAGR of 8.10% during 2018 – 2023 in line with growing population across the region and new installations
- China, and India are expected to be the major contributors in the HVAC market in line with favorable government policies to ensure the installation of energy-efficient HVAC systems in new buildings
- Mature HVAC markets such as Japan, the US, and West European nations are forecast to witness slower growth through 2023 due to the existence of large install base of HVAC with periodic replacement demand

Product Overview

- Cooling systems are expected to be the largest segments through 2023 on account of rising demand from the residential and commercial sectors
- HVAC systems are being integrated with next-generation technologies, such as IoT sensors, remote control systems, and hybrid HVAC units to provide optimum comfort with reduced energy consumption
- The residential segment held the majority share of the total revenue in 2017 owing to rise in real estate sector in developing regions

Figure 18: HVAC market by product type (2018)



Source: Tarkett Estimates

Product Categories

Heating equipment

Heat pumps are expected to hold the largest size of the HVAC system market for heating equipment in the near future. The heating equipment market is witnessing growing acceptance for heat pumps owing to their energy-efficiency and evolving capabilities of performing both space cooling and heating functions.

Air conditioning

The market for split air conditioners is deemed to experience a steady growth owing to its adoption in residential buildings.

Ventilation equipment

Air handling units held a major share of the HVAC system market for ventilation equipment in 2017. Increasing pollution levels have triggered a rise in the number of health issues among people.

Key Players

- The HVAC vendor and developer landscape are growing more complex as companies optimize their strategies to meet a challenging pricing environment
- the market is fragmented in nature with the presence of numerous small and large manufacturers who compete in terms of prices and quality

DAIKIN	United Technologies	Johnson Controls	Ingersoll Rand	LG
FERGUSON	evolution group	AO Smith.	Haier	uponor

Industry Opinion

"I think the early part of the summer has not been great, but the heat last couple of weeks should help the movement of the residential business in the U.S. We expect the market -- the replacement market still to be good with this late summer coming in. Hopefully, that helps with that. But overall, market may be flat to slightly down now. We were expecting it to be up sort of mid-single-digit -- low to mid-single-digit when we came in."

– Akhil Johri, Executive VP & CFO, United Technologies

"For the industry overall, we still expect North America residential HVAC shipments to be up mid-single digits. We are reducing the outlook for commercial and refrigeration end markets in North America. We now expect commercial shipments to be flat for the industry in 2019 and expect refrigeration shipments to be slightly down for the industry."

– Todd M. Bluedorn, Chairman & CEO, Lennox

"We project U.S. residential water heater industry volumes will be down 50,000 to 100,000 units in 2019 as replacement remains stable, but new home construction appears to be lackluster due to labor shortages and weatherdelays."

– Kevin J. Wheeler, CEO, President & Director, AO Smith

Outlook

- The HVAC market is expected to witness growing influx of technologies such as integrated Artificial Intelligence Platform-as-a-Service based solutions that will digitally transform offices and operations into streamlined, next-generation workplaces
- The market for the unitary air conditioners of the HVAC systems for cooling equipment is expected to showcase the strongest growth during 2019 – 2023
- Increasing focus on the smart buildings worldwide due to stringent regulatory environment will support a lower carbon footprint, significant reduction in the usage of water, and less electricity consumption
- Further, remodeling and new construction of residential, commercial or industrial buildings is anticipated to HVAC systems

The HVAC market is expected to showcase significant growth in line with increase in urbanization, and rising digital transformation for smart buildings.

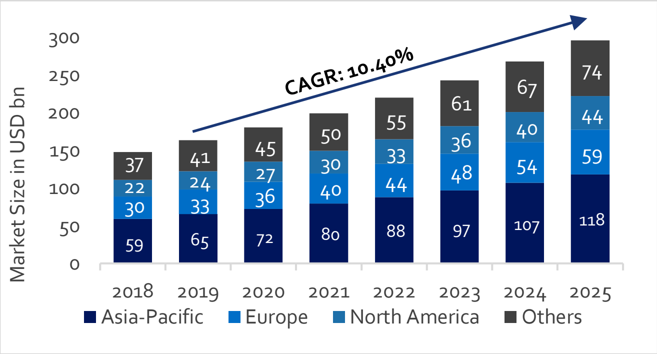
Market Overview

The growing demand for energy-efficient lighting systems is characterized by the increasing need for reducing energy consumption in the residential as well as the industrial sectors. Further, Government initiatives for developing smart cities around the world are majorly contributing to the rising demand for smart lighting solutions. Connected lighting systems are expected to emerge as one of the most critical components of the smart city infrastructure by contributing largely to the sustainability goals of the projects.

The global lighting market was worth USD 147.80bn in 2018 and is expected to reach USD 295.50bn by 2025 growing at a CAGR of 10.40% during 2019 – 2025.

Regional Overview

Figure 19: General Lighting Market Size by Region (2018 – 2025)



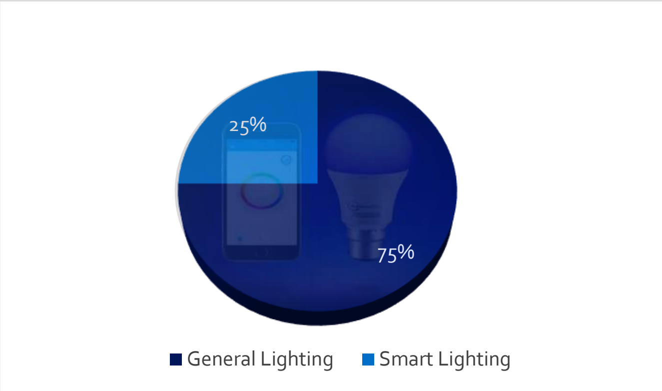
Source: MarketsandMarkets, issuu, BCC Research

- The global lighting industry was dominated by the APAC market, with the share of ~40% or USD 53.60bn including China, which was accounted for 21% or USD 17.20bn of the global market
- APAC was followed by the developed markets across Europe (20%) and North America (15%) in 2017
- Southeast Asia is gradually developing into a dynamic LED lighting market on account of rapid growth of local economy, infrastructure investment and population
- The penetration of LED lighting in the Middle East and Africa market is rapidly increasing showcasing significant potential through 2025

Product Overview

- Contrary to the existing stronghold of general lighting segment, LED will regarded as the most promising technology in terms of commercial viability in 2020 among several kinds of clean technology
- The main product segments in the industry are lighting fixtures and control gear, which account for 82% of the lighting market
- Lighting components that include lamps, light bulbs, electrical elements and light frames account for approximately 15% of the overall market revenue, and neon and electronic signs account for 3%

Figure 20: General Lighting Market by Product Type (2018)



Source: Tarkett Estimates

Product Categories

General Lighting

General lighting was the largest lighting market segment, with the total market size of about USD 82.10bn in 2017 that is expected to grow at a CAGR of 5% during 2019 – 2025. The general lighting segment dominates the global lighting market, with ~75% of the share. However, the market shares for general lighting are expected to decline significantly due to rapid industry-wide adoption of smart lighting technologies.

Smart Lighting

The smart lighting segment is expected to grow at a CAGR of 22% by 2023. According to CIVITTA's forecasts, LED technology will gain up to 95% share in the lighting market by 2025. The lighting segment, traditional energy-efficient technologies are the mainstream, but in the next five years, LED technology is expected to dominate the market globally.

Key Players

- The shift toward LED and connecting lighting will fundamentally alter the composition of the global lighting market by 2020. The global lighting market is highly fragmented with several players are holding less market share
- The LED lighting ecosystem comprises market participants across hardware component manufacturers, prototype designers, and Original Equipment Manufacturers (OEMs)
- The industry-wide acknowledgement of the advantages of LED including low energy consumption, long lifetime, and enhanced versatility are driving industry participants to gain a larger market share from LED segment

Signify (formerly Philips Lighting)	OSRAM	ZUMTOBEL	FAGERHULT	AcuityBrands
EATON Powering Business Worldwide	HUBBELL	Panasonic	HAVELLS	ENDO
	IRIS	OPPLE LIGHTING	Vankon LIGHTING	

Industry Opinion

"There is voice assistance, third-party apps and product formats to connect with people. All of these are coming together to spur the growth of smart lighting"

– Sumit Padmakar Joshi, Vice-Chairman and Managing Director, Philips Lighting India

"Our medium- to long-term visibility remains . This is due to the turbulences and the accelerated transformation in the lighting industry. And in this situation, economic developments for our market beyond the current year cannot be predicted."

– Olaf Berlien, Chairman & CEO, OSRAM Licht

"With rural development being one of the major focuses, there has been an increased allocation for the rural electrification which will in turn benefit the manufacturing and sale of the electrical appliances."

– VP Mahendru, Chairman, EON Electric

Outlook

The sales of traditional lighting products is expected to grow slightly to account for 80% of the global lighting market by 2020; however, is likely to decline post 2020. The imposition of stringent government regulations on traditional lighting products is expected to support the growth in smart lighting market. Factors such as the increasing adoption of LED technology and the usage of connected lighting systems or smart systems is likely to driver the global lighting market.

- With the emergence of Light Fidelity (LiFi) and smart home automation in 2018, additional technologies are likely to prosper including Bluetooth mesh, Gooee, Zigbee and radio frequency technology
- The demand for lighting products is expected to stimulate due to the Tokyo Olympics in 2020
- The lighting manufacturers will expand cross-industry to create business opportunities, which can be seen across architectural smart lighting, human centric lighting, horticultural lighting, fishing lighting, special lighting

The market is expected to be driven by the increasing adoption of LED technology and the usage of connected lighting systems or smart systems.

Flooring

- Ceramics
- Resilient Flooring (Vinyl, Linoleum & Rubber)
- Wood & Laminate
- Carpet

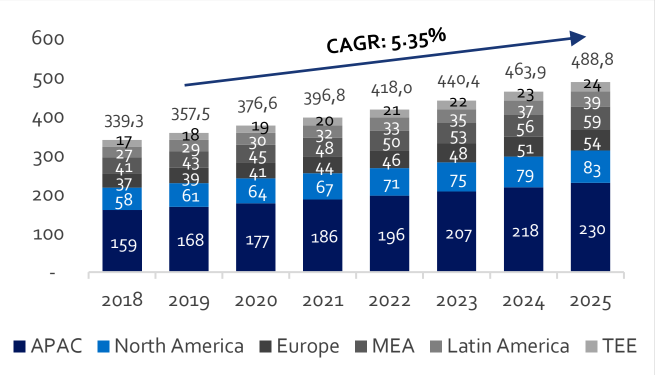
Market Overview

The flooring market is estimated to be at USD 339.30bn in 2018 and is expected to reach USD 488.80bn in 2025. The flooring market is divided into residential and commercial end-users. In 2018, the residential market represented approximately one-third of global sales, while the commercial market represented approximately two-thirds. In these two primary market categories and in each region, majority sales are for renovation projects, while a minority is for new construction.

The flooring market size is estimated to grow at a CAGR of 5.35% during 2019 – 2025.

Regional Overview

Figure 21: Global Flooring Market Size by Region (2018 – 2025)



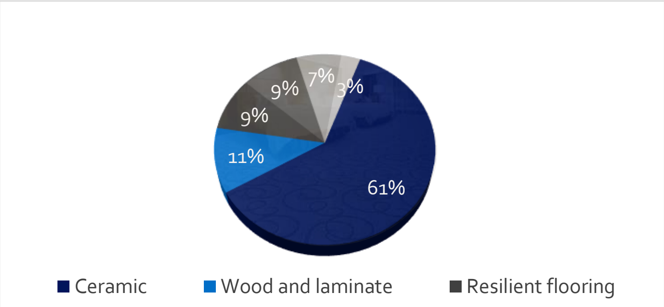
Source: Tarkett Estimates

- During H1 2019, in North America, housing sales remained below 2018 levels, adversely impacting flooring demand
- However, Luxury Vinyl Tiles (LVT) continued to grow significantly, although affecting other flooring product categories by taking market share from them
- Many other geographic markets softened with their economies, reducing flooring sales and increasing pricing pressure from excess capacity
- In Europe, political and Brexit concerns have slowed the economic growth. Australia was further impacted by a housing bubble. Brazil has slowed due to political uncertainties. However, the Mexican ceramic industry is growing despite a slowing local economy

Product Overview

- Ceramic products account for 61% of the total flooring market as they are predominantly used in the APAC market which accounts for 47% of the flooring market
- Within resilient flooring, LVT is the fastest growing segment in US and Europe
- Wood and laminates market looks to be gaining market share in the US, however European market is showing a slowdown in growth and the rest of the world is showcasing penetration

Figure 22: Flooring Market by Type of Product



Source: Tarkett Estimates

- Carpet tiles segment, largest segment within carpets, is expected to expand at a CAGR of 3.60% in terms of revenue till 2025 owing to increasing product demand from high-traffic commercial and institutional applications

Ceramic Tiles

The global ceramic tiles market was worth around USD 70.90bn in 2018, representing a CAGR of 9.10% during 2011-2018. The market is further projected to cross USD 107.20bn by 2024, exhibiting a CAGR of 7.20% during 2019 – 2024.

Resilient Flooring

The global resilient flooring market reached a volume of 1,060mn sqm in 2018, registering a CAGR of 5.10% during 2011-2018. The market is further projected to reach a volume of 1,441mn sqm by 2024.

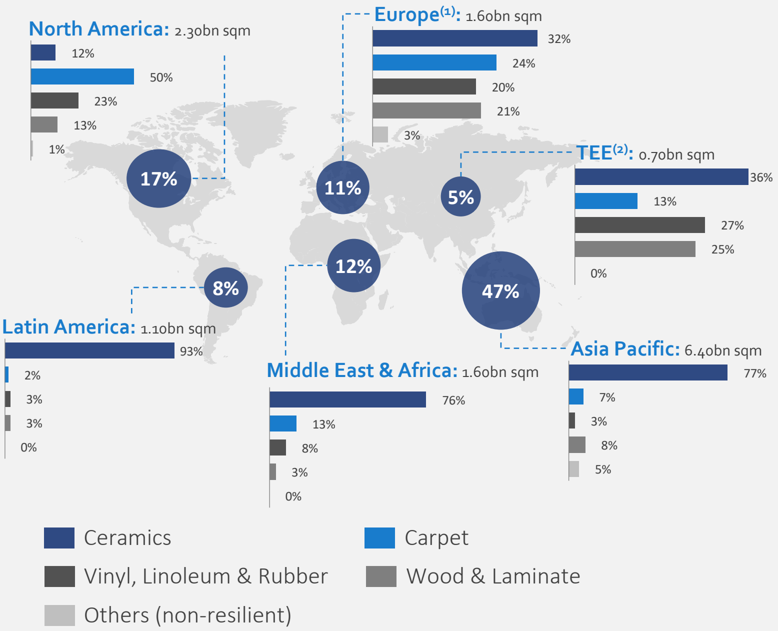
Carpet

The global carpet flooring market size is expected to reach USD 105.50bn by 2025, from USD 84.60bn in 2018. It is anticipated to register a CAGR of 3.20% during 2019 – 2025.

Wood and laminates

The global wood and laminate flooring market garnered USD 95.90bn in 2018 and is expected to reach USD 141.1bn by 2025, registering a CAGR of 5.70% during 2019 – 2025.

Global Flooring Market Breakdown by Geography and Products



Source: Tarkett estimate (World Flooring Report – June 2019)
(1)Excluding Turkey; (2)TEE – Turkey and Eastern Europe

- Asia Pacific is the largest market accounting for 47% of the total flooring market
- Within Asia Pacific, Ceramic tiles is the largest market accounting for 77% of the market, due to the regional preference for ceramic tiles
- North America is the second largest market accounting for 17% of the market
- Within North America, Carpets account 50% of the market, due to its demand primarily in the commercial flooring market and is also favored in the housing market
- Europe accounts for 11% of the flooring market, with a fairly balanced demand for all flooring types
- Resilient flooring, specifically LVT, is the fastest growing market in Europe and North America, because compared to ceramics (leading solution in Eastern Europe and CIS) LVT has lower installation costs, higher ease of replacement and greater design freedom

Key Players

- In all geographies, the competitive landscape is crowded by hundreds of small-sized businesses and imports, often from lower-cost emerging countries, that add to the competitive pressure
  - Imports can account for up to 60 – 70% in some extreme cases like the UK, but rarely represent less than 20% of total volumes in developed markets
- Mohawk Industries is the largest player in the Flooring market with product offerings across the sector

2018A Revenue (USD mn)		Ceramics	Vinyl & Linoleum	Wood & Laminate	Carpet
Mohawk Industries	9.984	X	X	X	X
Shaw	4.000		X	X	X
Tarkett	3.174		X	X	X
Beaulieu International	2.226		X	X	X
Forbo	1.363		X		X
Interface	1.180		X		X
Gerflor	1.045		X		
Lamosa	902	X			
RAK Ceramics	756	X			
Mannington	753	X	X	X	X
Balta	723				X
Armstrong Flooring	728		X	X	
Pamesa Ceramica	604	X			
Kajaria Ceramics	412	X			
SCG Ceramics	378	X			
Portobello	254	X			

Source: Company data, Barclays Research

Industry Opinion

"The US ceramic market has declined in 2019 due to lower home sales, a continued growth of LVT and customers trading down. Prior to the increase in Chinese ceramic tariffs, a significant amount of inventory was imported, increasing pressure on the industry. We believe our ceramic sales are in line with the US market, with commercial outperforming residential. Increased competition and excess inventory have impacted both our pricing and mix. The government investigation of Chinese ceramic dumping has progressed and appears likely to be implemented."

– William Wellborn, President, COO & Director, Mohawk Industries

"The outlook for the performance of the whole year 2019 remains challenging. In the second half, we anticipate a further economic slowdown in a number of countries."

– E. Schneider, Executive Chairman and Stephan Bauer, CEO, Forbo

"In India, the tile industry is going through a transitional phase due to recent shift from Coal Gasifier to Natural Gas, resulting in increased compliance for the unorganized sector which should accelerate the shift towards organized players. Liquidity challenges post the IL&FS default are affecting the home-building industry and broader housing market. The tile industry has been flat owing to lackluster demand from real estate and supply pressure. Kajaria Ceramics expects tile market to remain flat in FY 2020 as well."

– Ashok Kajaria, Chairman & Managing Director, Kajaria Ceramics

Outlook

- Asia continues to remain the largest consumer of ceramic tiles, accounting for 68% of the global consumption. Nevertheless, the results for Asia reveal a slowdown in China (production down by 1.50% and exports down by 11.40%) due to the anti-dumping duty imposed by many countries on Chinese tiles. However, it is expected to be partially offset by a some growth in India, Iran and Vietnam.
- In the US, LVT as a product category is expected to continue to outperform and gain market share from a low base. In Europe, the growth of LVT market is slowing down but still a growing market, especially in commercial segment. However, established Western players are facing competition from Asian manufacturers in the segment, some of whom are their suppliers as well. However, the tariffs in North America against Chinese manufacturers are expected to rebalance some of the flows throughout the world.
- In the US, flooring demand in total will only grow low-single-digit due to slower growth in large renovation projects. In North America, there is a slowdown in residential housing that could continue throughout the end of 2019, causing major companies to focus on cost reduction and flexing production in order to adapt to any level of demand that they may have.
- Organic growth in the commercial segment is expected to be in the range of 2 – 4%. For commercial segments, such as office, hospitality, health care, elderly care and education, being able to deliver with a short lead time is very important and this is something that the Chinese competitors cannot achieve with 80-day lead time, most of it on the sea, from Asia. This is expected to add to the competitive advantage of the larger Western players.
- The carpets segment, which accounts for 50% of the US flooring market and primarily driven by the commercial segment, is down not only in volume but also in value throughout the H1 2019. Q3 2019 organic growth in the carpet segment is anticipated to be in the range of 0 – 2% followed by organic growth of 3% to 4% in Q4 2019.

Roofing & Siding

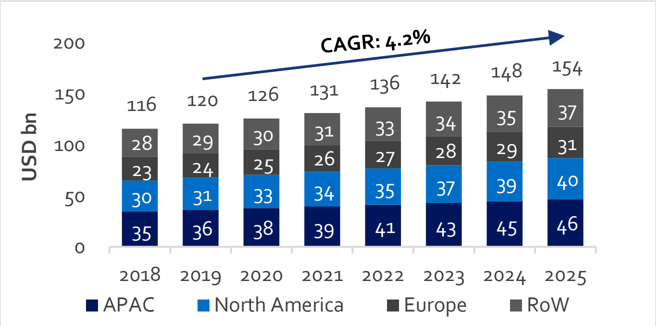
Market Overview

The global roofing market Is estimated to be USD 116bn in 2018 and is expected to reach USD 154bn in 2025. The rise in construction activities and increased use of synthetic roofing products are some of the major drivers for the growth of the global roofing market. Among the key product segments, bituminous roofing accounts for almost 50% of the overall market. Low cost, easy installation, and long durability of bituminous roofing accounts for its large market share. Application-wise, residential is anticipated to hold significant share of the market vis-à-vis revenue. However, non-residential is the leading application segment of the roofing market due to increase in construction of commercial buildings and hotels in both developed and developing countries.

Roofing Market to grow at a CAGR of 4.20% during 2019 – 2025.

Regional Overview

Figure 23: Global Roofing Market by Region (2018 – 2025)



Source: Grandview Research Analysis

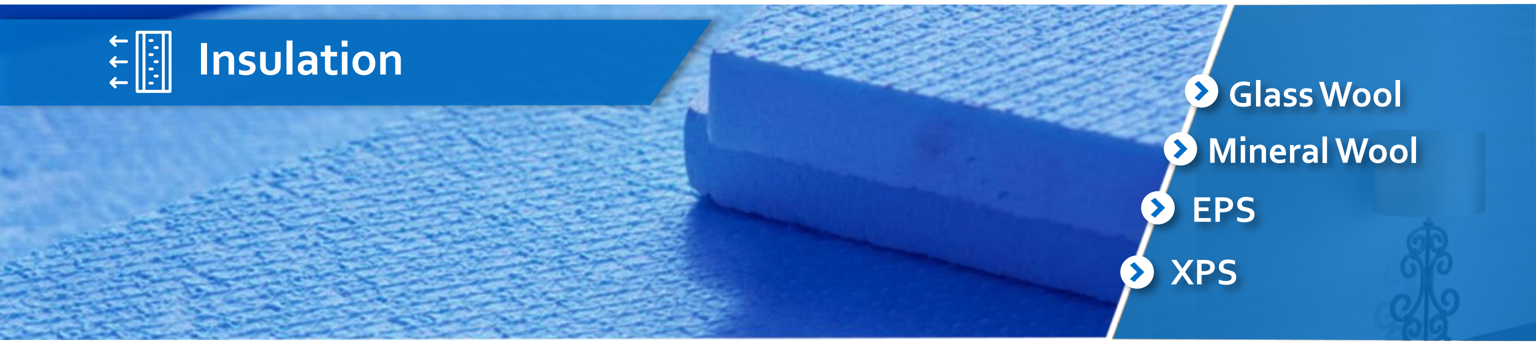
- Asia-Pacific accounted for the largest market share of 30% in 2018 due to the growth of the building & construction industry and the improvement in financial conditions in this region have led to the rise in the demand for roofing market
- North America is estimated to be the second largest region for the roofing market due to the presence of several roofing providers in the region, such as Atlas Roofing Corporation, BMI Group Services GmbH, and Carlisle Companies

Key Players

Owens Corning | Duro-Last The World's Best Roof | Armstrong | Carlisle

Atlas | Braas Monier Building Group | Wienerberger | etex inspiring ways of living

Insulation



Market Overview

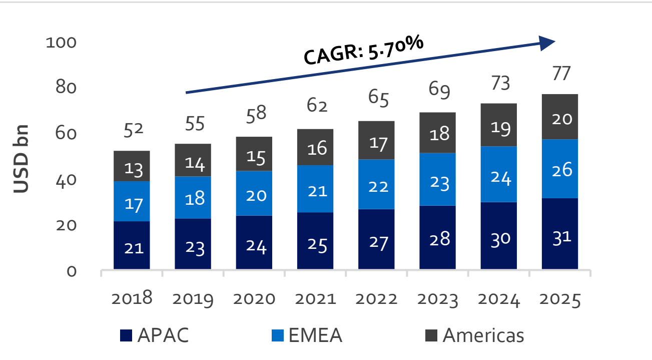
The global insulation market size was estimated at USD 52.20bn in 2018 and is expected to reach USD 77bn in 2025. Increasing consumer awareness regarding energy conservation is estimated to propel the growth. The market is segmented into glass wool, mineral wool, Expanded Polystyrene (EPS), Extruded Polystyrene (XPS), Combiner Manufacturing System (CMS) fibers, calcium silicate, aerogel, cellulose, Polyisocyanurate (PIR), phenolic foam and polyurethane. EPS insulation emerged as the largest product segment, which accounted for 26.70% of the insulation market share in 2018 and is estimated to continue its dominance during 2019 – 2025 on account of its light weight and high-tensile strength. Glass wool was the second largest product sector that is expected to expand at CAGR of 5.50% during 2019 – 2025.

When segmented on basis of applications, the infrastructure sector accounted for the largest market share in 2018 and is estimated to expand at a CAGR of 5.90% during 2019 – 2025 on account of increasing number of insulation-intensive' buildings in urban areas.

Global insulation market is expected to expand at a CAGR of 5.70% during 2019 – 2025.

Regional Overview

Figure 24: Global Insulation Market by Region (2018 – 2025)



Source: Grandview Research Analysis

- Asia Pacific accounted for the largest market share of 40.40% in 2018 and is estimated to expand at a CAGR of 6.60% during 2019 – 2025
- The reason being, rising oil production in the economies of China and India and concerns regarding significant energy wastage coupled with the demand for the materials in refurbishing and renovation
- Europe was the second largest region accounted for 30% market share in 2018 and is estimated to expand at a substantial CAGR in the future
- European insulation demand growth has outperformed construction output by an average 270bps per annum in the last 15 years
- The two key drivers of this outperformance are energy efficiency regulations and the oil price
- Energy efficiency regulations have played an important role in increasing insulation demand, in particular in 2006-07 when the growth premium jumped to average 1,700bps following a rise in countries' legislation, on the back of the EU Energy performance Building Directive 2002; a similar spike in demand was observed in 2013 following the rise in countries' energy efficiency regulations
- Oil price movements play a critical role in insulation demand premium as high oil prices shorten the payback period. Conversely, low oil prices discourage additional investments into insulation as the payback is less attractive.

Key Players

ROCKWOOL	SAINT-GOBAIN	Wienerberger	Owens Corning
KNAUF	cellofoam	Xella	GAF

Industry Opinion

"The European Investment Bank are pledging something like EUR 100bn until 2030 for energy efficiency improvement. So I think potentially we have seen the first of energy renovation, energy efficiency improvements in France, boosting insulation demand. And then it will take 2, 3, 4 years before that starts to become serious in the other markets ... Germany, high level of building permits, almost record level, high order stock in the construction sector, but they are stuck somehow. Some people talk about labor shortages. It looks a little bit depressed even though the backlog is very good ... In Eastern Europe, Czech Republic is leading the way. Even though the activity is quite good, I think that's been the stock builddown. And we have seen that some of our competitors have panicked on the pricing on projects"

– Jens Birgersson, President & CEO, Rockwool International

"In China the trade war effect continued, that very quickly spread into the whole South Asia region. So South Asia is negative with the exception of India. It seems that India is not so closely linked to China ... In the US, it's slower, you see the same trend, flat roof, big project, logistics center have noticed a little bit lower activity. But fundamentally, yes, we are growing but a little bit lower growth than before."

– Jens Birgersson, President & CEO, Rockwool International

"Our outlook for the second half of 2019 in the Insulation business is stronger than in the first half based on the expectation of improving the US housing starts and normal seasonality."

– Michael C. McMurray, Senior VP & CFO, Owens Corning

Outlook

- In Roofing, growing trend of development of reflective coatings for dark-colored roofing materials, which enable better heat reflection and reduce overall energy requirements, is presumed to fuel market expansion of the roofing industry
- In the insulation market, funding by the US Department of Energy for the development of phenolic foams is estimated to boost demand for product, which, in turn, is estimated to drive the global growth. Furthermore, technological enhancements in thermal insulation like vacuum panels and Research and Development (R&D) activities in transparent thermal product will drive the industry growth
- Factors such as growing applications of insulation materials owing to their emission reduction potential; the building rating systems; stringent government regulations and emission control norms, and large-scale investment by government and federal agencies are propelling market growth globally

Evolving technology to improve the weatherability, installation and aesthetics of roofing materials is projected to boost product demand.

Paints & Coatings

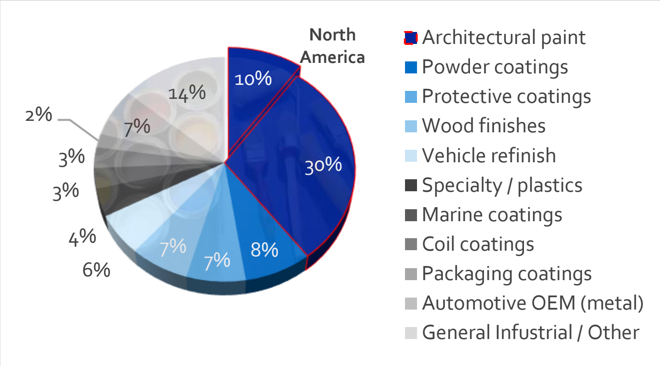
Architectural Paint

Market Overview

In 2018, Architectural paint accounted for ~40% of the total market valuing at USD 52bn in 2018 and is projected to reach USD 79bn in 2025 at a CAGR of 6.11% during 2019 – 2025.

Architectural coatings demand tends to fluctuate with the construction and home resale markets. In terms of end use, the global mix between 'do-it-yourself' (DIY) and professional (PRO) stands at about 40/60%. Overall, the residential market represents demand of 65% vs. commercial at 35% (higher in APAC), and remodeling activities make up about 70% of the demand vs. new construction at 30%. Remodeling leads in both residential (75%) and in commercial construction (60%).

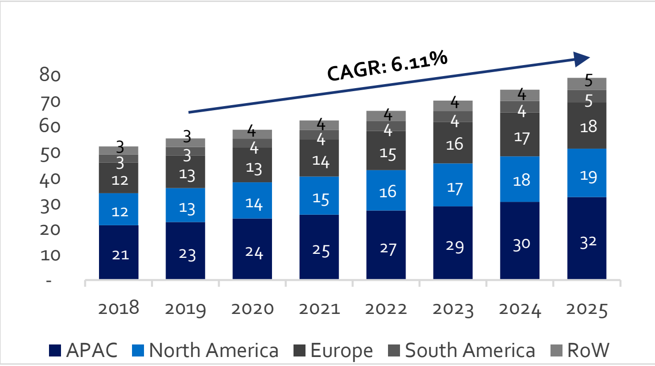
Figure 25: Global Paints and Coatings by Market Sector – 2018



Source: KNG, Akzo Nobel Estimates

Regional Overview

Figure 26: Architectural Paints Market by Region (2018 – 2025)



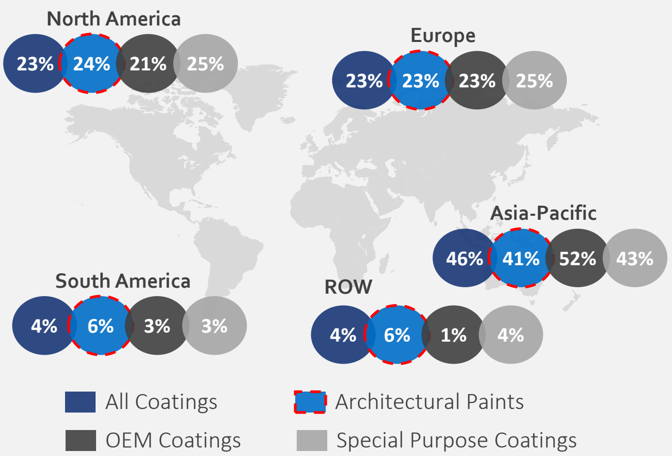
	2018	2019	2020	2021	2022	2023	2024	2025
APAC	21	23	24	25	27	29	30	32
North America	12	13	14	15	16	17	18	19
Europe	12	13	13	14	15	16	17	18
South America	3	3	4	4	4	4	4	5
RoW	3	3	4	4	4	4	4	5

Source: Sherwin Williams Actuals, Markets and Markets estimates

- In H1 2019, Decorative Paints showed good momentum in Europe, Middle East and Africa (EMEA)
- Volumes grew in Asia, including India, Thailand, Malaysia and Vietnam
- Positive developments continued for South America, excluding the adverse currency impacts
- In the US, decorative paints market remained challenging in 2019 due to less than expected housing starts and reduced remodeling activity as well. The market is expected to grow between 1% to 2% in 2019.
- In US, trend is moving from DIY to do-it-for-me due to changing preference of millennials

- **The Asia-Pacific paints and coatings market is projected to grow at the highest CAGR during 2019 – 2027.** APAC is a rapidly expanding paints and coatings market, due to growing economy and increasing middle-class population
- In India, Paints & Coatings industry is fairly structured with organized players accounting for 65-70% of the industry's sales. Demand for Paints depends on the housing sector and good monsoons. The Indian Government's push towards rural infrastructure spends expected to improve rural consumption, which is favorable for the industry. Overall business outlook for 2019-20 remains positive for the industry in India.

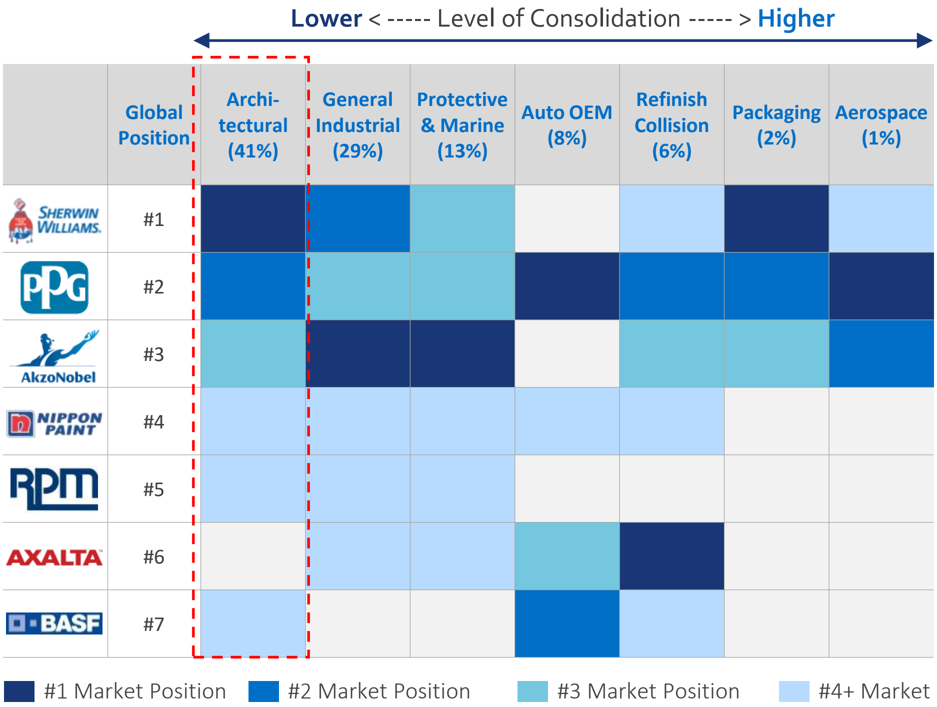
Geographic Split of Global Revenue



Source: KNG, Akzo Nobel Estimates

- Asia Pacific accounts for roughly 41% of the total Architectural Paints market, while 46% of the total Paints & Coatings market. Its also the fastest growing area
- North America accounts for 24% of the total Architectural Paints market
  - Within North America market is divided by end-use as follows, DIY (38%), Residential Repaint – Pro (29%), Non Residential Repaint (15%), New Residential (12%) and New Non Residential (6%)
- Europe accounts for 23% of the Architectural paints market; the market is semi consolidated, with top players accounting for ~50% of the market

Key Players



Source: IPPIC; company annual reports, PPG estimates

- **Architectural Paints** market is the largest market within the global paints & coatings market, but it also has the lowest consolidation due to the presence of a large number of small players, especially in the APAC region
- **Sherwin Williams** is the largest player in the Paints and Coatings market after the acquisition of Valspar in June 2017, for USD 11.30bn
- In June 2017, PPG Industries dropped its attempt to buy Dutch rival Akzo Nobel in a USD 29.50bn deal, due to repeated rejections from the company, legal defeats and hostility from Dutch politicians

Industry Opinion

"Geographically, sales were up in Latin America and flat in North America, which were more than offset by softness in Asia and Europe where sales decreased by low double digit and mid-single-digit percentages, respectively. We do not see a near-term catalyst driving significant improvement in the European or Chinese macroeconomic environment at this time. We expect demand in these regions to remain highly variable as it has over the first half of 2019 compared to a relatively more stable demand environment in North America."

– John G. Morikis, Chairman & CEO, Sherwin-Williams

"We see that market as growing this year. We would have said 2% to 3%. Given the challenging weather that we've had, they'll try to pick up as much of that as they can. So we might finish 1% to 2% for the year. But overall, our customers still have very good backlogs, and they feel very confident. They still are challenged to find enough labor to get all their projects done. But they've been able to successfully continue to win businesses that trend again from DIY to do-it-for-me. That's going to continue."

– Michael H. McGarry, Chairman & CEO, PPG Industries

"In India, the Architectural coatings business grew across all regions, with higher growths coming from upgradation products at the bottom of the pyramid. We saw some improvement in the demand conditions in the domestic market as compared to the previous year with trade and supply channels recovering from the past disruptions caused by demonetization and the implementation of the Goods and Services Tax (GST). However, customer confidence was uncertain and this has reflected in a marked slowdown witnessed in some of the other large sectors of the economy."

– Ashwin Dani, Chairman and K.B.S. Anand, Managing Director & CEO, Asian Paints

Outlook

- Market growth in the US, Western Europe, and Japan is expected to remain steady but at a slower pace, corresponding to the overall health of the regional economy. Overall demand to 2021 is expected to increase at an average annual rate of 3% in the US and 2% in Western Europe.
- Asia is projected to be the fastest growing market. Rising population levels, more middle class consumers, massive infrastructure developments and widespread urbanization in the region have increased demand for paints and coatings for buildings, public infrastructures and individualized living spaces.

Overall demand to 2021 is expected to increase at an average annual rate of 3% in the US and 2% in Western Europe.

- For paints and coatings, consolidation has become a long-term trend, especially in Western markets with organic growth. In North America, for example, the industry has been consolidating for decades. In certain end market segments, fewer than ten players (and in some cases, five or less) control over 90% of the market.
- Worldwide, however, the markets are still very fragmented overall. Successful consolidations can help paints and coatings companies to seize growth opportunities, enter new markets, improve capabilities, increase efficiencies through scale or improved processes, diversify their products, and rationalize their asset portfolios.
- New regulations, price fluctuations for raw materials and geopolitical uncertainty will continue to affect the paints and coatings industry. A general increase in global GDP for 2019, perhaps around 3.20% (according to IMF), may increase the potential for organic growth by businesses as opposed to growth by consolidation.

Trading Comparables

Company	Country	Market Cap (USD mn)	Enterprise Value (USD mn)	Revenue (USD mn) 2019E	Revenue (USD mn) 2020E	EBITDA Margin (%) 2019E	EBITDA Margin (%) 2020E	EV/Revenue 2019E	EV/Revenue 2020E	EV/EBITDA 2019E	EV/EBITDA 2020E	EV/EBIT 2019E	EV/EBIT 2020E	P/E 2019E	P/E 2020E
Windows & Doors															
Howden Joinery Group	UK	4,142	3,866	1,980	2,102	17.9%	18.0%	2.0x	1.8x	10.9x	10.2x	12.3x	12.2x	16.6x	16.3x
JELD-WEN	US	1,710	3,351	4,334	4,420	10.6%	11.3%	0.8x	0.8x	7.3x	6.7x	10.5x	16.2x	12.8x	11.8x
Masonite International	Canada	1,341	2,180	2,190	2,273	12.9%	13.4%	1.0x	1.0x	7.7x	7.2x	15.4x	13.7x	18.1x	14.5x
PGT Innovations	US	895	1,210	756	800	18.3%	18.8%	1.6x	1.5x	8.8x	8.0x	12.1x	13.1x	16.3x	16.6x
Inwido	Sweden	317	599	686	689	12.8%	13.0%	0.9x	0.9x	6.8x	6.7x	9.4x	8.3x	7.1x	6.4x
Eurocell	UK	243	331	341	360	11.9%	12.2%	1.0x	0.9x	8.2x	7.6x	11.0x	10.9x	10.1x	9.3x
Average						**14.1%**	**14.4%**	**1.2x**	**1.1x**	**8.3x**	**7.7x**	**11.8x**	**12.4x**	**13.5x**	**12.5x**
Median						**12.8%**	**13.2%**	**1.0x**	**0.9x**	**8.0x**	**7.4x**	**11.5x**	**12.6x**	**14.6x**	**13.2x**
Plumbing & Hardware															
Plumbing															
Masco	US	11,943	15,034	8,424	8,714	17.1%	17.3%	1.8x	1.7x	10.5x	10.0x	11.9x	12.5x	15.8x	16.4x
Fortune Brands	US	7,208	9,527	5,812	6,043	15.8%	16.3%	1.6x	1.6x	10.3x	9.7x	12.4x	15.6x	14.2x	18.5x
TOTO	Japan	6,105	5,658	5,521	5,716	10.7%	11.8%	1.0x	1.0x	9.6x	8.4x	14.6x	13.0x	20.9x	20.5x
LIXIL Group	Japan	4,767	12,076	16,978	17,094	6.6%	8.0%	0.7x	0.7x	10.8x	8.8x	48.5x	21.6x	nm	29.1x
China Lesso Group	China	2,862	4,403	3,712	4,141	19.3%	19.1%	1.2x	1.1x	6.1x	5.6x	7.1x	8.2x	7.1x	7.6x
Astral Poly Technik	India	2,206	2,234	407	482	15.7%	16.0%	5.5x	4.6x	35.0x	28.9x	43.0x	48.7x	63.2x	75.4x
Polypipe Group	UK	970	1,214	567	590	21.5%	21.6%	2.1x	2.1x	10.0x	9.5x	12.2x	14.0x	12.9x	14.9x
Finolex Industries	India	864	840	459	508	17.6%	17.3%	1.8x	1.7x	10.4x	9.6x	11.6x	10.7x	17.1x	16.8x
Hardware (incl. security)															
Legrand	France	19,305	22,758	7,221	7,484	22.4%	22.5%	3.2x	3.0x	14.0x	13.5x	16.1x	16.7x	20.7x	21.2x
Allegion	Ireland	9,209	10,479	2,868	2,993	23.8%	24.4%	3.7x	3.5x	15.4x	14.4x	17.5x	19.7x	20.2x	21.2x
dormakaba	Switzerland	2,838	3,615	2,929	3,032	16.4%	17.0%	1.2x	1.2x	7.5x	7.0x	8.8x	9.4x	19.3x	21.2x
Richelieu Hardware	Canada	1,108	1,124	797	na	10.3%	na	1.4x	na	13.6x	na	na	15.9x	na	21.5x
agta record	Switzerland	1,004	912	442	459	17.0%	17.1%	2.1x	2.0x	12.2x	11.6x	15.3x	21.9x	22.2x	32.9x
Tyman	UK	510	879	774	792	16.4%	17.0%	1.1x	1.1x	6.9x	6.5x	8.6x	13.0x	8.1x	14.5x
Average						**16.5%**	**17.4%**	**2.1x**	**2.0x**	**12.7x**	**11.4x**	**18.3x**	**17.5x**	**21.2x**	**24.4x**
Median						**17.0%**	**17.2%**	**1.8x**	**1.7x**	**10.5x**	**9.6x**	**13.5x**	**15.6x**	**19.3x**	**21.2x**
Architectural Paint															
Sherwin-Williams	US	49,313	60,347	18,049	18,884	17.5%	18.6%	3.3x	3.2x	19.1x	17.2x	21.7x	34.8x	25.0x	44.5x
PPG Industries	US	26,781	32,092	15,373	15,911	16.8%	17.4%	2.1x	2.0x	12.4x	11.6x	15.4x	17.6x	18.0x	20.2x
Akzo Nobel	Netherlands	20,529	20,849	10,355	10,631	13.9%	15.8%	2.0x	2.0x	14.4x	12.4x	18.8x	27.4x	30.6x	43.5x
Asian Paints	India	20,298	20,182	2,994	3,410	19.8%	20.6%	6.7x	5.9x	34.1x	28.7x	39.4x	40.5x	57.5x	64.1x
Nippon Paint	Japan	15,259	16,097	6,129	6,832	15.8%	16.1%	2.6x	2.4x	16.7x	14.7x	20.1x	19.6x	38.1x	37.2x
RPM International	US	8,783	11,079	5,673	5,895	13.7%	15.3%	2.0x	1.9x	14.2x	12.3x	17.4x	27.7x	21.7x	37.5x
Berger Paints India	India	4,888	4,893	939	1,073	16.1%	16.7%	5.2x	4.6x	32.4x	27.3x	38.1x	42.7x	57.2x	68.1x
Kansai Nerolac Paints	India	3,469	3,445	782	873	15.2%	15.8%	4.4x	3.9x	29.0x	25.0x	32.2x	32.4x	47.5x	50.7x
STO	Germany	664	701	1,530	1,560	10.1%	10.5%	0.5x	0.4x	4.5x	4.3x	7.2x	7.3x	10.3x	10.5x
Average						**15.4%**	**16.3%**	**3.2x**	**2.9x**	**19.7x**	**17.1x**	**23.4x**	**27.8x**	**34.0x**	**41.8x**
Median						**15.8%**	**16.1%**	**2.6x**	**2.4x**	**16.7x**	**14.7x**	**20.1x**	**27.7x**	**30.6x**	**43.5x**

Company	Country	Market Cap (USD mn)	Enterprise Value (USD mn)	Revenue (USD mn)		EBITDA Margin (%)		EV/Revenue		EV/EBITDA		EV/EBIT		P/E	
				2019E	2020E	2019E	2020E	2019E	2020E	2019E	2020E	2019E	2020E	2019E	2020E
HVAC & Lighting															
Schneider Electric	France	48,936	57,509	30,009	31,224	17.5%	17.9%	1.9x	1.8x	11.0x	10.3x	13.4x	14.6x	17.5x	17.6x
Koninklijke Philips	Netherlands	42,954	48,385	21,407	22,442	17.3%	18.4%	2.3x	2.2x	13.1x	11.7x	18.3x	24.4x	26.8x	27.9x
Daikin Industries	Japan	37,183	39,503	24,143	25,717	14.6%	14.9%	1.6x	1.5x	11.2x	10.3x	14.7x	15.9x	20.3x	22.2x
Johnson Controls	Ireland	34,096	38,766	24,315	25,238	13.7%	14.1%	1.6x	1.5x	11.7x	10.9x	15.8x	15.8x	19.8x	22.2x
Ferguson	UK	18,110	19,997	22,244	23,215	8.1%	8.3%	0.9x	0.9x	11.0x	10.3x	12.5x	15.0x	15.7x	19.5x
Lennox	US	9,745	11,341	3,803	4,031	18.7%	18.3%	3.0x	2.8x	15.9x	15.4x	17.7x	22.4x	21.2x	27.0x
A. O. Smith	US	7,829	7,662	3,090	3,213	19.0%	20.3%	2.5x	2.4x	13.0x	11.8x	14.9x	13.5x	19.6x	17.6x
NIBE Industrier	Sweden	6,363	7,163	2,615	2,745	15.6%	16.0%	2.7x	2.6x	17.6x	16.3x	22.5x	22.1x	27.8x	26.7x
Acuity Brands	US	4,977	5,000	3,806	3,940	15.9%	16.1%	1.3x	1.3x	8.3x	7.9x	9.4x	10.9x	14.3x	14.3x
OSRAM Licht	Germany	4,012	4,631	3,898	4,202	8.9%	11.5%	1.2x	1.1x	13.3x	9.6x	nm	29.3x	nm	38.2x
Signify	Netherlands	3,678	4,751	6,963	6,948	11.4%	11.4%	0.7x	0.7x	6.0x	6.0x	7.7x	9.7x	11.7x	11.9x
Fagerhult	Sweden	931	1,402	807	881	16.0%	16.6%	1.7x	1.6x	10.8x	9.6x	16.7x	17.1x	17.6x	16.1x
Uponor	Finland	774	1,095	1,229	1,235	12.7%	13.2%	0.9x	0.9x	7.0x	6.7x	11.0x	8.3x	13.1x	12.4x
Volution Group	UK	443	540	296	310	19.8%	19.9%	1.8x	1.7x	9.2x	8.7x	10.1x	21.7x	11.1x	25.3x
Zehnder Group	Switzerland	431	449	702	722	9.7%	10.4%	0.6x	0.6x	6.6x	6.0x	10.4x	12.7x	13.6x	15.9x
Zumtobel Group	Austria	331	555	1,308	1,324	7.5%	8.6%	0.4x	0.4x	5.6x	4.9x	14.3x	nm	24.5x	nm
Average						**14.2%**	**14.8%**	**1.6x**	**1.5x**	**10.7x**	**9.8x**	**14.0x**	**16.9x**	**18.3x**	**21.0x**
Median						**15.1%**	**15.5%**	**1.6x**	**1.5x**	**11.0x**	**9.9x**	**14.3x**	**15.8x**	**17.6x**	**19.5x**
Flooring															
Mohawk Industries	US	8,502	11,799	10,004	10,245	15.2%	16.0%	1.2x	1.2x	7.8x	7.2x	12.5x	10.8x	12.4x	9.9x
Trex Company	US	5,075	5,013	755	855	26.4%	28.6%	6.6x	5.9x	25.1x	20.5x	27.5x	28.3x	36.7x	37.7x
Forbo Holding	Switzerland	2,322	2,267	1,286	1,312	17.8%	17.7%	1.8x	1.7x	9.9x	9.8x	12.9x	12.6x	16.6x	16.5x
Kajaria Ceramics	India	1,071	1,061	449	507	15.6%	16.1%	2.4x	2.1x	15.2x	13.0x	18.3x	19.7x	29.2x	32.3x
Tarkett	France	985	1,911	3,293	3,354	9.3%	10.0%	0.6x	0.6x	6.3x	5.7x	13.9x	16.8x	15.6x	16.9x
Interface	US	656	1,360	1,349	1,394	15.1%	15.9%	1.0x	1.0x	6.7x	6.1x	8.9x	19.3x	7.3x	13.1x
Ras Al Khaimah Ceramics	UAE	405	880	738	766	17.7%	17.8%	1.2x	1.1x	6.7x	6.4x	10.3x	10.6x	7.2x	8.1x
Somany Ceramics	India	169	249	254	282	9.5%	10.0%	1.0x	0.9x	10.3x	8.8x	13.7x	12.7x	19.9x	22.1x
Armstrong Flooring	US	144	179	669	691	6.8%	6.8%	0.3x	0.3x	3.9x	3.8x	nm	nm	nm	nm
Average						**14.8%**	**15.4%**	**1.8x**	**1.6x**	**10.2x**	**9.0x**	**14.7x**	**16.4x**	**18.1x**	**19.6x**
Median						**15.2%**	**16.0%**	**1.2x**	**1.1x**	**7.8x**	**7.2x**	**13.3x**	**14.8x**	**16.1x**	**16.7x**
Roofing, Siding & Insulation															
Saint-Gobain	France	20,161	34,814	47,539	47,982	11.6%	12.0%	0.7x	0.7x	6.3x	6.0x	9.3x	21.6x	10.2x	40.7x
Kingspan Group	Ireland	8,431	9,494	5,152	5,351	12.9%	13.1%	1.8x	1.8x	14.3x	13.5x	18.1x	18.9x	20.8x	21.6x
Carlisle Companies	US	8,194	9,447	4,853	5,023	17.9%	18.6%	1.9x	1.9x	10.8x	10.1x	13.8x	18.5x	17.5x	23.0x
James Hardie Industries	Ireland	6,877	8,127	2,557	2,723	23.1%	24.2%	3.2x	3.0x	13.8x	12.3x	17.4x	33.0x	20.4x	39.0x
Owens Corning	US	6,174	9,673	7,200	7,428	17.8%	18.5%	1.3x	1.3x	7.5x	7.1x	11.6x	11.6x	12.2x	11.3x
Armstrong World	US	4,660	5,247	1,065	1,137	38.0%	38.5%	4.9x	4.6x	13.0x	12.0x	16.2x	18.7x	20.9x	24.7x
Wienerberger	Austria	2,737	4,202	3,851	3,967	16.5%	17.3%	1.1x	1.1x	6.6x	6.1x	10.8x	15.0x	11.0x	17.4x
Rockwool	Denmark	2,150	3,856	3,089	3,213	18.9%	18.9%	1.2x	1.2x	6.6x	6.3x	9.8x	9.6x	7.1x	6.9x
Average						**19.6%**	**20.1%**	**2.0x**	**1.9x**	**9.9x**	**9.2x**	**13.4x**	**18.4x**	**15.0x**	**23.1x**
Median						**17.9%**	**18.5%**	**1.6x**	**1.5x**	**9.2x**	**8.6x**	**12.7x**	**18.6x**	**14.8x**	**22.3x**
Overall Average						**15.4%**	**16.0%**	**1.9x**	**1.8x**	**11.8x**	**10.6x**	**15.8x**	**18.1x**	**20.0x**	**23.7x**
Overall Median						**15.8%**	**16.1%**	**1.6x**	**1.6x**	**10.5x**	**9.6x**	**13.7x**	**15.9x**	**17.5x**	**20.2x**

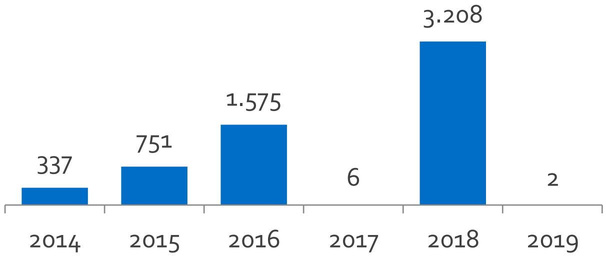
Source: FactSet

M&A Trends

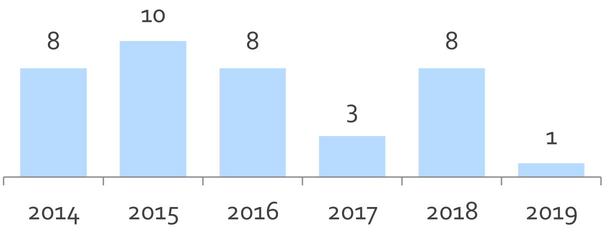
Throughout 2018, M&A activity in the Building Products sector remained robust. Overall deal volume and aggregate transaction values of pending and closed transactions declined slightly in 2017 as some sellers' valuation expectations outran the market. Despite slightly lower transaction volume, valuation and purchase price multiples remained strong throughout the year signaling an optimistic long-term outlook on the overall building products sector.

Windows and Doors

M&A Deal Amount (USD mn)



M&A Deal Volume (# Deals)

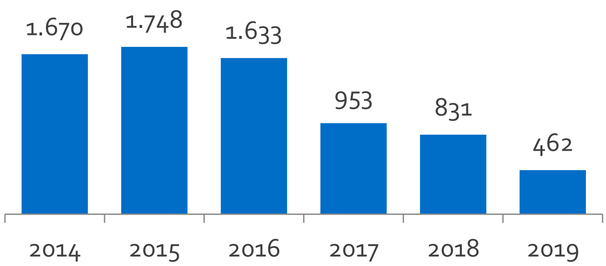


Key Deals since Jan 2018

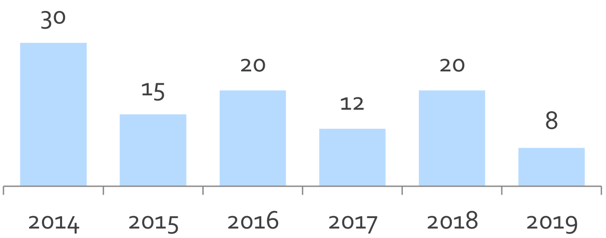
Date	Target	Buyers	Deal Value (USD mn)	Implied EV (USD mn)	EV/Revenue (x)	EV/EBITDA (x)
11-Jun-19	Booth Industries	Stainless Metalcraft	2.3	2.3	0.2x	-
23-Oct-18	Kempurna	Midah Industries	1.0	1.0	-	-
20-Sep-18	Savimex Corporation	Thanh Cong Textile Garment Investment	1.1	5.1	-	-
24-Jul-18	WWS Acquisition	PGT Innovations	360.0	360.0	-	19.2x
3-May-18	CornellCookson	Clopay Building Products Company	180.0	180.0	-	-
24-Apr-18	Nature Home	DeHua TB New Decoration Material	53.3	264.7	0.6x	5.5x
7-Mar-18	Ashland Products	Amesbury Group	101.0	101.0	1.5x	9.0x
31-Jan-18	Ply Gem Midco	Clayton, Dubilier & Rice	2,332.0	2,260.6	1.1x	9.9x
Average					**0.8x**	**10.9x**
Median					**0.9x**	**9.5x**

Plumbing & Hardware

M&A Deal Amount (USD mn)



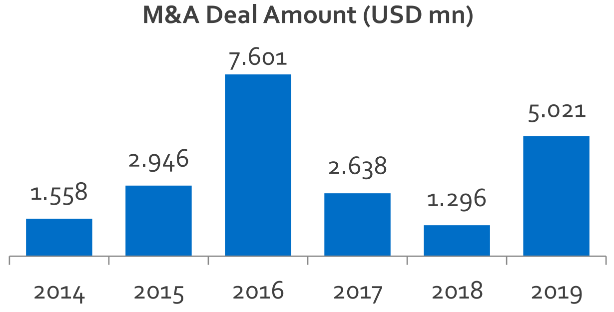
M&A Deal Volume (# Deals)

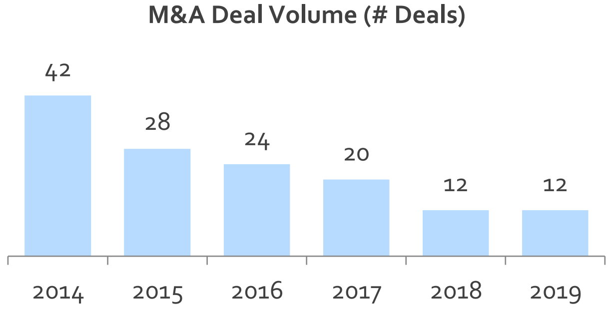


Key Deals since Jan 2018

Date	Target	Buyers	Deal Value (USD mn)	Implied EV (USD mn)	EV/Revenue (x)	EV/EBITDA (x)
24-May-19	Adequa WS	Grupo Ostendorf	12.3	12.3	-	-
26-Apr-19	Fujian Superpipe	Beijing Ruihui Haina Technology Industry Fund	33.2	728.7	4.6x	-
14-Mar-19	Colcom Group	SIMONSWERK	45.2	45.2	1.5x	-
22-Jan-19	Y.Stern Engineering	First Israel Mezzanine Investors	34.0	48.6	-	-
14-Dec-18	Methven	GWAIL	101.3	98.9	1.4x	11.8x
25-Oct-18	Sanidom	Thermador Groupe	25.0	25.0	-	-
1-Oct-18	APG Polyplastic Group	Strongfield Marketing	103.1	206.3	-	-
18-Aug-18	Shenzhen Niuzhi IoT Technology	Shenzhen Infinova	0.4	2.9	-	-
14-Aug-18	Huliot	Tene Capital	19.0	38.0	-	-
26-Jun-18	V J Technology	Primary Capital Partners	39.3	39.3	1.0x	-
22-May-18	Hongjing High-Tech	Jiangxi Hongsheng Holding Group	1.6	59.7	2.7x	19.1x
4-May-18	Kunshan Kinglai Hygienic Materials	Li Shanhong	24.1	481.2	4.7x	34.1x
2-May-18	Lecico Egypt	The Olayan Group	1.1	100.1	0.7x	5.6x
4-Apr-18	IPS S.A.I.C. y F.	Grupo Rotoplas	56.5	56.5	-	-
3-Apr-18	The Arab Ceramic	Unknown Fund	0.5	35.3	0.9x	9.1x
20-Mar-18	Guangzhou Seagull Kitchen and Bath Products	Shanghai Qiyu Information Technology	18.1	456.8	1.4x	15.0x
13-Mar-18	Binh Minh Plastics	The Nawaplastic Industries (Saraburi)	102.4	306.7	1.8x	9.2x
1-Mar-18	Business Activity in Roccasecca of Ideal Standard	Saxa Gres Società per azioni	36.6	36.6	-	-
14-Feb-18	Qingdao Globe Union Technology	Qingdao Jiangshan Yam Jia	9.9	9.9	-	-
24-Jan-18	Sentini Sanitarywares	LIXIL Corporation	39.3	41.0	-	-
17-Jan-18	Interfit India	National Fittings	2.9	2.9	0.8x	-
12-Jan-18	Fujian Superpipe	Chen Yueqing	208.1	997.6	4.4x	33.1x
Average					**2.1x**	**17.1x**
Median					**1.4x**	**13.4x**

HVAC & Lighting

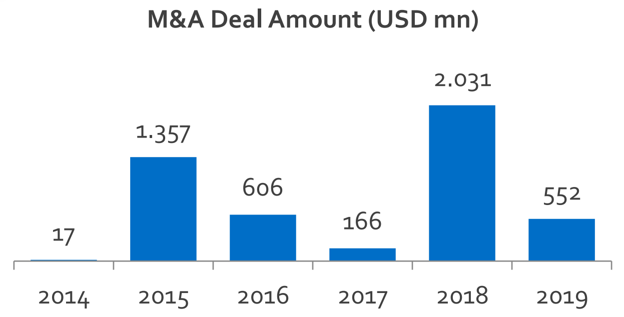


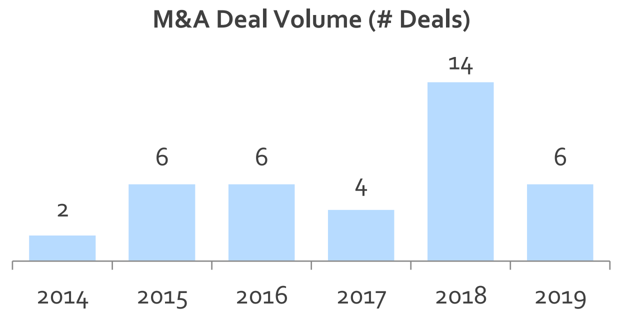


Key Deals since Jan 2018

Date	Target	Buyers	Deal Value (USD mn)	Implied EV (USD mn)	EV/Revenue (x)	EV/EBITDA (x)
26-Jul-19	Svetlina AD-Sliven	Synergon	0.5	5.0	-	-
23-Jul-19	Xiamen Yankon Energetic Lighting	Zhejiang Yankon Group	7.9	158.4	0.4x	-
3-Jul-19	OSRAM Licht	Bain Capital; The Carlyle Group	4,755.4	4,404.6	1.0x	27.7x
4-Jun-19	Shenzhen Changfang Group	Nanchang Opto Valley Group	25.5	583.1	2.5x	45.0x
7-May-19	Carmanah Technologies	Trimin Capital; TMH Capital Corp	75.9	11.3	0.4x	-
4-Apr-19	MSD Research	CSW Industrials	10.1	10.1	-	-
22-Mar-19	Sakshi PowerTech	G.S. Soni Group	0.8	-	-	-
15-Mar-19	Svetlina AD-Sliven	Synergon	0.5	1.4	-	-
8-Mar-19	AMERLUX	Delta Electronics (Netherlands) B.V.	90.0	90.0	0.0x	-
8-Mar-19	Jiangmen Bolin Lighting Technology	Solartech International	1.9	11.3	-	-
5-Feb-19	Lifi Labs	Buddy Technologies	52.0	52.0	1.9x	-
28-Dec-18	Lightup Design Company	Patcharee Hotriem and Photjanee Termthanam	0.7	7.1	-	-
15-Oct-18	iGuzzini illuminazione	AB Fagerhult	408.3	408.3	-	-
8-Oct-18	Confidence and Light	Lucibel	0.6	0.6	0.4x	-
8-Aug-18	Promptec Renewable Energy Solutions	Havells India	2.4	7.8	-	-
11-May-18	Feelux	Advanced Goldman Investment Fund	26.2	692.2	6.7x	63.9x
3-May-18	Fluence Bioengineering	OSRAM Licht	73.0	67.0	-	-
5-Apr-18	HYUNDAI LED	Nuriplan	7.5	7.5	0.5x	-
30-Mar-18	Shenzhen Changfang Group	Nanchang Opto Valley Group; Nanchang Xinwang Capital Enterprise	114.2	666.2	2.4x	15.1x
19-Mar-18	BAG electronics	OSRAM Licht	32.0	28.4	0.5x	-
15-Mar-18	Veko Lightsystems International	AB Fagerhult	80.1	80.1	1.8x	-
8-Jan-18	L.D. Kichler	Masco	550.0	548.0	1.2x	-
Average					**1.5x**	**37.9x**
Median					**1.0x**	**36.3x**

Flooring



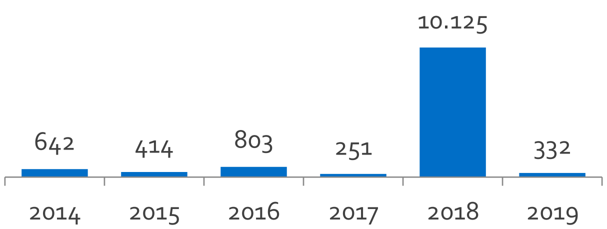


Key Deals since Jan 2018

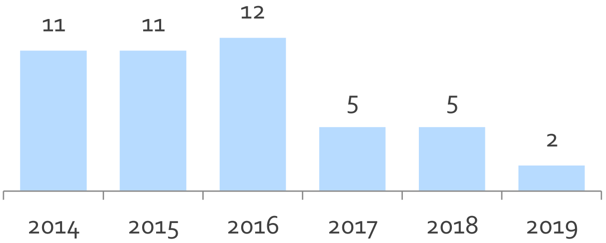
Date	Target	Buyers	Deal Value (USD mn)	Implied EV (USD mn)	EV/Revenue (x)	EV/EBITDA (x)
31-May-19	Zhejiang Yongyu Bamboo	Shanghai Shuixing Home Textile	23.2	83.0	0.7x	5.7x
22-May-19	Cecrisa Revestimentos Cerâmicos	Cerâmica Urussanga	204.9	201.3	1.3x	14.5x
24-Apr-19	Laminam	Alpha Group	279.8	279.8	2.3x	9.6x
21-Feb-19	Pentafloor	Bianca and Larry Shakinovsky	1.1	1.1	-	-
3-Jan-19	T.A.C. Ceramic Tile	L.A.R.K. Industries	42.5	42.5	0.6x	-
22-Dec-18	Commander Vitrified	Investor Group	1.2	4.7	0.3x	-
17-Dec-18	Formica	Broadview	840.0	840.0	1.2x	-
15-Nov-18	Armstrong Wood Products	American Industrial Partners	100.0	100.0	-	7.2x
8-Nov-18	Bishu Kosan	Mino Ceramic	2.9	9.8	0.5x	-
5-Oct-18	Hanwha L&C	Hyundai Home Shopping Network	330.3	330.3	-	-
10-Aug-18	Gruppo Ceramiche Ricchetti	Fincisa; Ceramiche Industriali Di Sassuolo E Fiorano; QuattroR SGR	133.3	128.3	0.7x	-
21-Jun-18	EVER Home	Undisclosed Buyer	1.2	3.6	-	-
14-Jun-18	nora systems	Interface Europe	448.5	448.5	1.7x	-
23-May-18	Westag & Getalit	Broadview Industries	76.5	177.6	0.6x	8.3x
24-Apr-18	Nature Home	DeHua TB New Decoration Material	53.3	264.7	0.6x	5.5x
1-Jan-18	KLW Resources	KLW Holdings	6.2	20.5	-	-
Average					**1.0x**	**8.5x**
Median					**0.7x**	**7.8x**

Roofing, Siding & Insulation

M&A Deal Amount (USD mn)



M&A Deal Volume (# Deals)

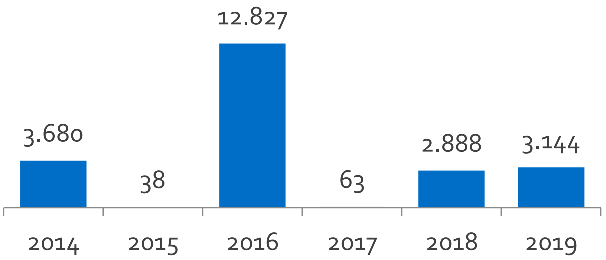


Key Deals since Jan 2018

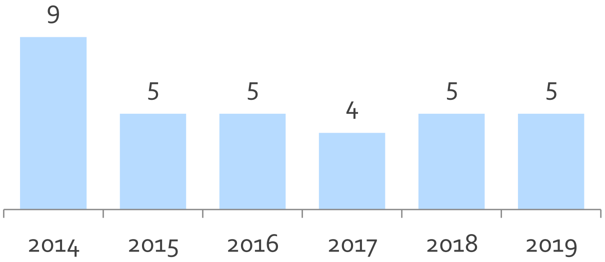
Date	Target	Buyers	Deal Value (USD mn)	Implied EV (USD mn)	EV/Revenue (x)	EV/EBITDA (x)
30-Jul-19	Seal for Life Industries	Arsenal Capital Partners	328.0	328.0	2.7x	-
5-Mar-19	Byggma	Investor Group	4.3	88.0	0.5x	6.5x
17-May-18	IMERYS TC	Lone Star Funds	1,179.7	1,179.7	3.3x	8.9x
26-Mar-18	USG Corporation	Gebr. Knauf KG.	6,609.8	6,937.3	2.2x	13.1x
15-Mar-18	DanicaZipco Sistemas Construtivos	Pátria Investimentosa	3.0	6.9	-	-
9-Mar-18	Speciality Coatings (Darwen)	Speciality Coatings Group	0.8	-	-	-
31-Jan-18	Ply Gem Midco	Clayton, Dubilier & Rice	2,332.0	2,260.6	1.1x	9.9x
Average					**2.0x**	**9.6x**
Median					**2.2x**	**9.4x**

Architectural Paint

M&A Deal Amount (USD mn)



M&A Deal Volume (# Deals)



Key Deals since Jan 2018

Date	Target	Buyers	Deal Value (USD mn)	Implied EV (USD mn)	EV/Revenue (x)	EV/EBITDA (x)
18-Apr-19	Rostov Paint Factory	O3 Coatings	1.7	1.7	-	-
17-Apr-19	DuluxGroup	Nippon Paint	3,107.6	3,082.5	2.4x	16.5x
18-Mar-19	Drywood Norge	Teknos	-	-	-	-
11-Feb-19	Poli-Farbe Vegyipari Korlatolt Felelossegu Tarsasag	Fabryka Farb i Lakierów Sniezka	31.7	38.7	0.9x	-
7-Feb-19	Diera - FAbrica De Revestimentos, Colas E Tintas	Barbot - Indústria de Tintas	2.6	2.6	-	-
13-Sep-18	MPM Holdings	KCC Corp; Wonik QnC Corp; SJL Partners	2,865.9	2,664.9	1.0x	7.4x
18-Jun-18	Fabryo	AkzoNobel	-	-	-	-
29-May-18	J.W. Ostendorf	Hempel Group	-	-	-	-
16-Jan-18	Colorin Industria de Materiales Sinteticos	Disal	16.3	17.3	0.6x	-
Average					**1.2x**	**12.0x**
Median					**1.0x**	**12.0x**

Appendix

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Abbreviations

BCG: Boston Consulting Group

BN: Billion

CAGR: Compound Annual Growth Rate

CEO: Chief Executive Office

CIS: Commonwealth of Independent States

CMS: Combiner Manufacturing System

CPVC: Chlorinated polyvinyl chloride

DIY: Do-it-Yourself

E7: Emerging 7

EBITDA: Earnings Before Interest, Taxes, Depreciation, and Amortization

EESL: Energy Efficiency Services

EMEA: Europe, Middle East and Africa

EPS: Expanded Polystyrene

EU: European Union

EV: Enterprise Value

G7: Group of 7

GDP: Gross Domestic Products

GST: Goods and Service Tax

H1: Half-Year 1

HVAC: Heating, ventilation, and air conditioning

ICE: Internal Combustion Engine

LatAm: Latin America

LED: Light Emitted Diode

LiFi: Light Fidelity

LVT: Luxury Vinyl Tiles

mn: Million

na: Not Available

nm: Not Meaningful

OEMs: Original Equipment Manufacturers

PIR: Polyisocyanurate

PVC: Polyvinyl Chloride

PVC: polyvinyl chloride

Q1: Quarter 1

Q2: Quarter 2

Q3: Quarter 3

Q4: Quarter 4

R&D: Research and Development

SKUs: stock keeping units

SQM: Square Meters

TEE: Turkey and Eastern Europe

TN: Trillion

UK: United Kingdom

uPVC: Unplasticized polyvinyl chloride

US: United States

USD: United States Dollar

VOCs: Volatile organic compounds

VOCs: volatile organic compounds

XPS: Extruded Polystyrene

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