

Building bridges

Energy and commodities in the construction sector

S&P Global Platts special report

March 2019



Executive summary

NAVIGATING A DYNAMIC LANDSCAPE

Construction sector experts often point to the localized nature of their industry; how market dynamics change not only from country to country, but also from city to city.

Of course, every market has its own specific set of characteristics and challenges. But research carried out to support this report found that construction companies across the globe share many of the same concerns (see full results on pages 4 and 5).

Regardless of location, they are all subject to the state of their respective economies, margin squeeze due to rising labor and materials costs, and changing government policies.

Added to this is the impact of weather events on construction projects; something that could well become more frequent due to climate change.

Project specification changes, design error rectification and rework also make it harder to manage and adhere to budgets.

Construction companies are at the mercy of global commodity prices. For example, China produces half of the world's steel, much of which is used in domestic property and infrastructure construction.

If China's economy slows and less construction steel is needed for domestic purposes, the country will export more, subsequently putting downwards pressure on global steel prices. The opposite scenario could in turn result in higher construction steel prices.

Then there are the one-off events that can affect global prices: the US government's import tariffs on steel and aluminum pushed up costs for local end-users, while

Turkey was obliged to find new markets for its construction steel as it was no longer cost-effective to export to the US. This added to a supply glut in Asia. Another example is February's tragedy at an iron ore tailings dam in Brazil owned by the world's largest producer Vale, which sent global iron ore and steel prices soaring.

Energy and commodities can play a dual role in construction. They are needed to build the projects – diesel used by “yellow goods” equipment, structural steel, aluminum window frames, and polymer used in PVC pipes, for example. These projects then become the facilities that produce energy and commodities.

Lower oil and energy prices help to reduce business and operating costs, which can spur investment and economic growth. But lower prices act as a disincentive to invest in developing new oil and gas projects.

When oil prices collapsed in 2014, companies continued developing projects that had reached FID stage, but committed to no new ones. Exploration capex was slashed by around 50% over 2014-2016, and it took almost another three years before the industry recovered.

Many construction and engineering firms lock in prices with their suppliers and vendors, but can then take five years to execute projects. If commodity prices escalate, internal costs also rise, and companies could potentially operate at a loss on certain projects.

This is why a view on energy and commodity prices – what drives them and where they may head – is essential, as was acknowledged by many of the companies interviewed for this report.

As one executive at a major US engineering firm explained: “If we have a mining client, we need to track the price of copper or iron ore, for example. If the price collapses, that means less investment, so we don't need to spend so much effort in pursuing opportunities because they are very unlikely to go ahead. So those are important data points for us.”

GO DEEPER

S&P Global Platts provides essential coverage across the construction industry's raw material supply chain. We offer the widest selection of price assessments, news and analytics for the commodities your business depends upon.

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KEY TAKEAWAYS

Rising operational costs, increased competition, changing market dynamics and government policies continue to provide the biggest challenges for companies operating in the construction sector. As a result, most organizations say they reference commodity price benchmarks to mitigate risk and to use in negotiations with suppliers and customers. Roughly one-third of industry players use commodity price forecasts as part of their scenario planning.

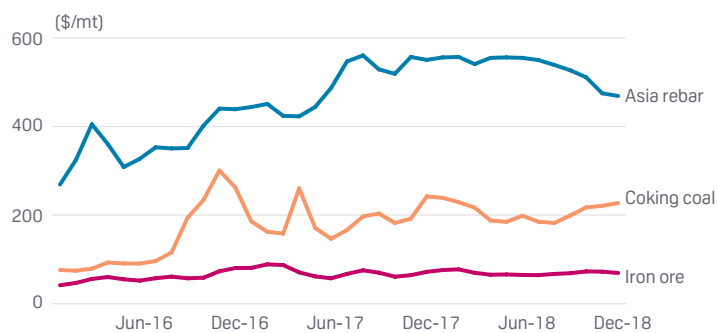
India is undergoing a huge infrastructure boom, driven by increasing urbanization and strong economic growth that will generate strong demand for energy, steel and other metals and commodities over the longer term. Roughly two-thirds of the country's population is considered to be rural. The United Nations has projected that India will add some 416 million urban dwellers by 2050. They will need apartments to live in, as well as cars, fridges and air-conditioners.

China's real estate sector is a bellwether for the health of the country's economy, and will continue to be a huge driver of energy and commodities demand. S&P Global Ratings expects China's property sector to contract by 8%-12% in 2019 and sees apartment and house prices falling by 5%. Real estate and infrastructure combined account for more than 60% of total steel consumption. The property construction sector has a huge influence on both domestic and global steel and commodity prices.

China's State Council and Ministry of Finance have said they will speed up investment in infrastructure and shorten project approval times which will support the sector in 2019 and offset a potentially softer property construction market.

Moderating housing sales and permits in the US because of low inventory and high home prices, along with higher interest rates, could contribute to housing starts falling below 1.3 million units in 2019. This would have a ripple effect on building materials and 2019 could be the year the decade-long slow-charging recovery from the 2007 housing crash actually stalls.

KEY FERROUS METALS PRICES



Source: S&P Global Platts

European construction output growth will continue in 2019 and 2020, but at less than 2%, as new housing construction decelerates amid a shift towards civil engineering construction and infrastructure projects. Eastern Europe is likely to record higher growth than Western Europe on average.

An evolution in the way LNG is bought and sold is creating financing challenges for new liquefaction projects. After being underpinned by long-term, oil price-linked contracts with strong-credit buyers for several decades, LNG liquefaction project financing is entering a new phase as a growing number of new buyers seek more flexible lending terms, larger equity investments and the increased use of hedging.

LNG liquidity is expected to grow significantly over the next few years on the back of new supply from the US, according to S&P Global Platts Analytics. The US represents an important addition to the supply stack as its volumes are not only priced against natural gas prices in North America, but also because volumes from US terminals are not restricted to specific destinations.

The global construction industry faces a long-term trend towards higher prices for carbon-intensive materials, including cement and steel. In the short-term, the fragmented nature of carbon pricing initiatives means governments will continue to protect those industries from regional distortions arising from carbon pricing.

Global oil demand growth is expected to slow to 1.5 million b/d in 2019, down from 1.7 million b/d last year, due to more subdued economic growth in the most important demand centers of the US and China, and lower levels of global trade. S&P Global Platts Analytics projects global GDP will grow by 3.31% for 2019, slowing from 3.65% in 2018.

President Trump's import tariffs on steel (25%) and aluminum (10%) last year were well-received by the US steel sector but less so by the country's oil and gas sector, which complained of the impact of rising costs on new projects, particularly where supply contracts had already been agreed with overseas suppliers.

Japan's construction sector has been supported by projects related to the 2020 Tokyo Olympics, but the near-to medium-term demand outlook is mixed as there are not enough people to do the work. Japan suffers from a lack of construction workers due to negligible immigration. Steel demand from construction is expected to rise slightly in Japan's 2019 fiscal year, while Olympics infrastructure has also boosted Japanese aluminum and copper demand.

Petrochemical use in the building and construction industry is seeing changing trade patterns and growth amid US-China trade tensions. Despite the headwinds, global demand for PVC, which is used to make pipes, window frames, vinyl siding and flooring, is seen growing in line with bullish construction demand.

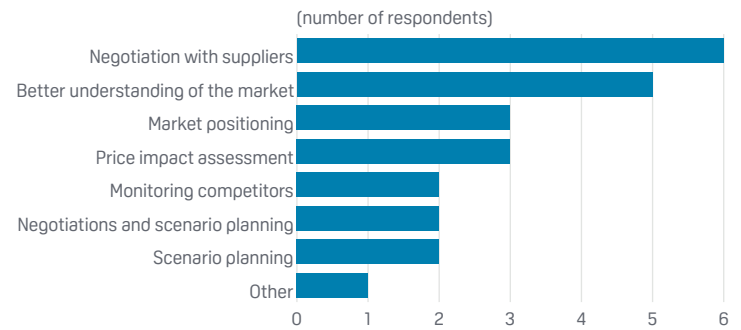
WHAT'S IMPORTANT TO CONSTRUCTION AND ENGINEERING FIRMS?

S&P Global Platts engaged market research firms to conduct in-depth interviews with senior executives at global construction, engineering and building materials companies across North America, EMEA and Asia-Pacific.

Key findings

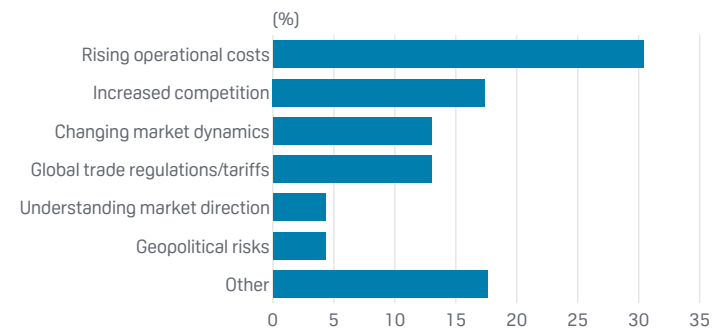
- Biggest challenges are rising operational costs, increased competition and changing market dynamics
- Main factors impacting the market are government policies, state of the economy, and the cost of materials and labor
- Most organizations reference commodity price benchmarks to mitigate risk and for use in negotiations with suppliers and customers
- Industry news and analysis are used by companies to get a better understanding of market dynamics and to help support price negotiations
- Almost one-third of respondents consider medium-to-long term commodity price forecasts as part of their scenario planning
- Respondents said the major commodities of interest are crude oil, steel, polymers and aluminum
- Construction is a relationship-based industry: Closed, long-term supply contracts are more frequent than open-market spot bids
- Nearly all companies said they looked at global opportunities and were not confined to their domestic markets

KEY REASONS FOR USING COMMODITY PRICE INFORMATION



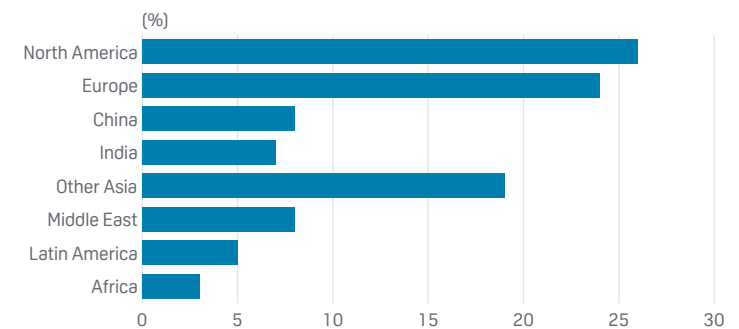
Source: S&P Global Platts

CURRENT CHALLENGES THAT ORGANIZATIONS FACE



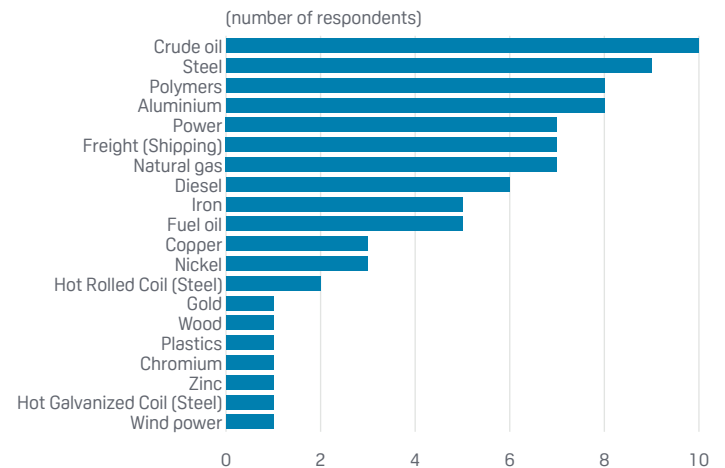
Source: S&P Global Platts

TARGET MARKETS FOR THE CONSTRUCTION SECTOR



Source: S&P Global Platts

COMMODITIES OF INTEREST TO CONSTRUCTION COMPANIES



Source: S&P Global Platts

“It’s important for us to learn which companies are entering into joint ventures with certain governments in certain areas, or which companies are running into financial troubles, thus potentially affecting our line of work.”

— Commercial strategist at global engineering and construction company

“We have no preferred long-term relationships currently; we often use our highly competitive bidding volumes to attract the best suppliers from the open market.”

— Procurement manager at large Japanese EPC

“By monitoring commodity price information, it helps us to better understand industry dynamics, material dynamics and supplier dynamics.”

— US-based supply manager

“As a Chinese-based manufacturer we are finding it harder to export our products to countries like the EU, which have enforced strict environmental policies. China itself is now aligning to those policies, so foreign companies will find harder to export their products to China as well.”

— Analyst at Chinese building materials company

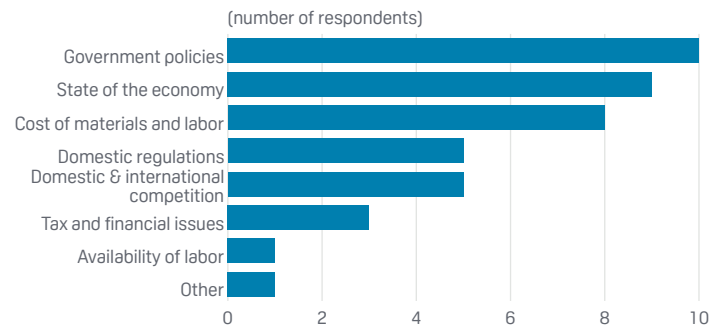
“If we have a mining client, we need to track the price of copper or iron ore, for example. If the price collapses, that means less investment, so we don't need to spend so much effort in pursuing opportunities because they are very unlikely to go ahead. So those prices are important data points for us.”

— Strategy manager at US engineering firm

“Depending on the opportunity, the region and the commodities, we look at hedging potentially to mitigate risks on the currency of the contract and the commodities that we use.”

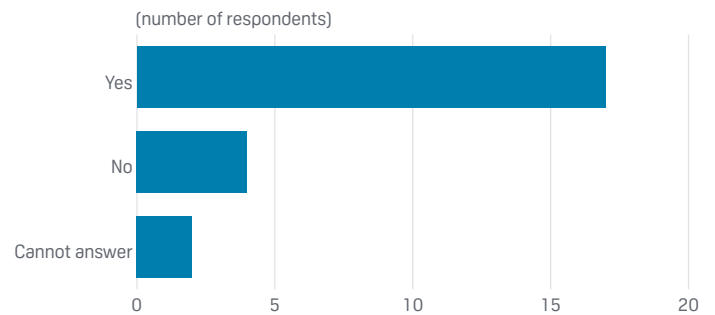
— Analyst at EU construction company

FACTORS IMPACTING THE MARKET



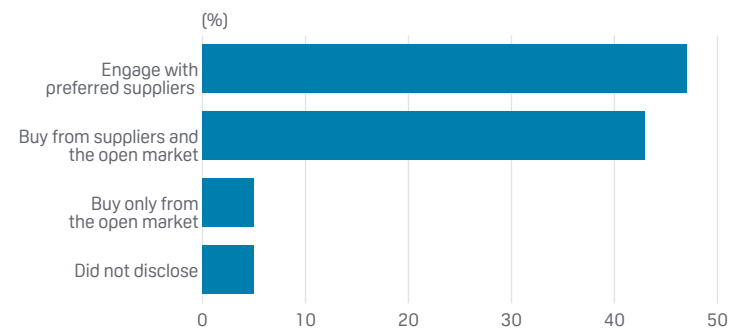
Source: S&P Global Platts

COMPANIES USING COMMODITY PRICE DATA IN THEIR BUSINESS WORKFLOW



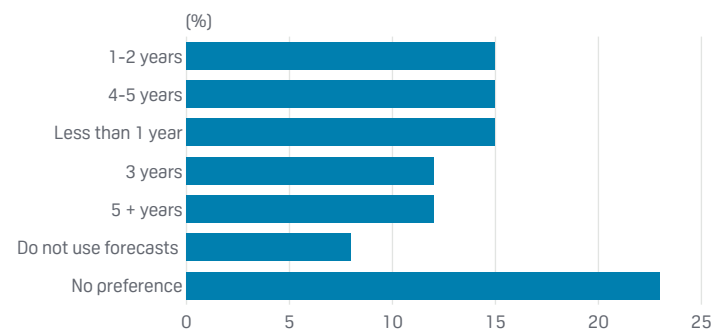
Source: S&P Global Platts

COMPANIES HAVE STRONG RELATIONSHIPS WITH THEIR SUPPLIERS



Source: S&P Global Platts

HOW FAR OUT DO CONSTRUCTION COMPANIES LOOK WHEN PLANNING RAW MATERIALS PURCHASES?



Source: S&P Global Platts

Carbon

RISING CARBON COSTS TO PUSH CONSTRUCTION INDUSTRY TOWARDS CLEANER FUTURE

The global construction industry faces a long-term trend towards higher prices for carbon-intensive materials, including cement and steel. In the short-term, the fragmented nature of carbon pricing initiatives means governments continue to protect those industries from regional distortions arising from carbon pricing. Nevertheless, if physical climate impacts continue to worsen, governments will come under increasing pressure to regulate emissions, and this will be felt in the construction sector.

Recent years have seen significant trends linked to climate change regulation and sustainability, including the slow and fragmented rise of carbon markets, carbon taxes, direct regulation of greenhouse gas emissions and falling costs of renewable energy.

In 2015, almost all countries signed on to the Paris Agreement, which seeks to encourage governments to pledge targets and actions on a voluntary basis in a bid to coordinate action at the global level to reduce emissions. It's hard to deny that major shifts are underway in the energy and emissions intensive sectors as the public and private sectors try to find ways to clean up, as well as promote growth and jobs. Clear examples of this include the rise of renewable energy in Europe and the auto industry switching production lines to build electric vehicles in Europe, America and Asia.

But the global construction sector hasn't yet played a big role in the road to a low-carbon economy. Is all that about to change? With a global turnover of \$7 trillion and employing about 120 million workers, the construction sector has a big role to play in building a low carbon economy, but this will only happen if incentives are in place. Governments would need to work closely with the sector in order to harness untapped sustainability improvements by making changes worthwhile.

EU CARBON PRICES RECOVER AS LEGISLATION TIGHTENS SUPPLY



Graph shows EU Allowance (EUA) carbon prices under EU Emissions Trading System
Source: S&P Global Platts, European Energy Exchange

Energy consumption in buildings and for building construction represents over a third of global final energy and contributes to nearly a quarter of global greenhouse gas emissions, according to the Global Alliance for Building and Construction.

Moreover, expected growth in world population — and with a large proportion of that growth expected to occur in cities — means construction activity is likely to grow significantly in the coming years, increasing demand for natural resources and the energy needed to transform those resources into building materials like cement, bricks, steel and glass.

CONSTRUCTION ON COLLISION COURSE

But rising global demand for these emissions-intensive materials puts the construction sector on a direct collision course with global efforts to rein in greenhouse gas emissions to avoid temperature increases of more than 2 degrees Celsius by 2100. Either these global targets will be missed, or major swathes of the world economy are facing transformative change. What gives?

While sectors like electricity generation are already making progress on replacing the least efficient coal-fired power stations with cleaner energy from natural gas, nuclear, wind, solar, hydro-electric and biomass, the construction sector hasn't followed suit in finding cleaner alternatives, according to global industry association, the Confederation of International Contractors' Associations.

Growing world population and rapid growth in purchasing power in emerging economies means that demand for buildings could increase by 50% by 2050, driving up energy demand and greenhouse gas emissions, according to CICA.

"Construction activity has not massively incorporated technologies that make better use of resources and reduce environmental impacts at the speed which other sectors of the economy have done, except for isolated experiences that are generally more widespread in more developed countries," the CICA said in a statement in June 2018.

"For all the above, our sector has ample space to improve and to contribute, and can and must assume a very important role of commitment to the future in these matters," the group said.

Some of the sector's industry bodies have expressed a clear wish to become more sustainable, but they say this effort is hampered by numerous factors, including economic, legal and regulatory, corporate reputation, end-user demands, and differences between countries on subsidies and requirements for finance.

This may be seen as a significant missed opportunity, especially given that the construction industry has one of

the largest cost-effective emissions mitigation potentials, with net cost savings and economic gains possible through implementation of existing technologies.

The construction sector's industry bodies outline a number of measures that could help promote sustainability, including encouraging and promoting analysis of projects and works in their entire life cycle, allowing sustainability issues to be incorporated in all the stages.

This could include contractual models that place sustainability into standard bidding processes, enabling an assessment of expected life cycle energy consumption of a project, for example.

Standards already in use include BREEAM – the world's leading sustainability assessment method for master-planning projects, infrastructure and buildings – which is recognised in 80 countries as of 2019. BREEAM standards involve continuous performance improvement and innovation by setting and assessing against a broad range of scientifically rigorous sustainability requirements that go beyond current regulations and practice.

Carbon pricing is another area that could help promote less carbon-intensive building materials, although this, like any other system of regulation, has to live within the reality of each country's economic and political landscape.

As of 2018, there were 51 carbon pricing initiatives either implemented or scheduled for implementation globally, according to a May 2018 report by the World Bank and consultants Ecofys. A total of 45 national and 25 sub-national jurisdictions were covered by those initiatives, representing 11 billion mt of CO₂ equivalent, or 20% of global greenhouse gas emissions.

The European experience of carbon trading highlights the issues raised by the broader fragmented nature of carbon

pricing initiatives at the global level. Under the legally binding EU Emissions Trading System, CO₂ emitters such as power generators and heavy industrials have faced carbon costs since 2005, encouraging them to reduce emissions over time.

But there is a big split in how those sectors are treated: European electricity generators do not face competition from outside the region, meaning regulators in Brussels were comfortable exposing them to the full costs of carbon. Iron, steel, cement, chemicals makers and refineries, on the other hand, have to compete with producers outside Europe where carbon costs don't necessarily apply. Since carbon costs would put them at a competitive disadvantage, European regulators agreed rules that would protect them from those costs, for example using free allocation of allowances.

Unless and until carbon pricing initiatives become truly global, this situation is likely to continue. What this means in practice, is that heavy industry cannot be expected to bear the brunt of carbon costs unless there is a level playing field at the global level.

Very significant progress will be needed to reduce global greenhouse gas emissions in order to meet the Paris Agreement's objectives. That the global construction industry has not yet played a big role thus far does suggest, at the very least, that there is potential for change in this sector. Rising pressure on governments to take meaningful action to limit greenhouse gas emissions does suggest the construction industry will find itself increasingly in regulators' sights.

Whether greater sustainability is achieved using carbon pricing initiatives or direct regulation remains to be agreed between the construction sector and government regulators. Either way, there is potential for carbon emissions-intensive materials and construction processes to become either more expensive, or no longer valid for use under direct regulation.

As it stands, countries are moving at very different speeds on sustainability, driven by a range of factors including level of industrialization, national priorities, access to domestic energy and raw materials, access to trade and finance, and pressure from civil society and corporate actors. This is likely to remain the case even under a scenario where governments step up their commitments under the Paris Agreement.

An economically affordable transition toward sustainable construction processes and materials would need close cooperation between industry bodies and government regulators, and involve workable regulatory frameworks that include the right incentives. Delaying this process too long would run the risk that physical climate impacts force governments into knee-jerk policy reactions that would be more disruptive for the industry (see box).

Knee-jerk policy risk: Fukushima and German nuclear power

In March 2008, an earthquake off the coast of Japan triggered a tsunami that caused a meltdown at a nuclear reactor in Fukushima province. Despite not being anywhere close to a seismic zone, Germany's government responded by changing course on nuclear power, pledging to phase out its remaining seven nuclear plants by 2022. The Fukushima disaster and Germany's response to it provide a clear example of how extreme localised events can prompt wholesale changes in regulation in other regions. Ahead of the Fukushima disaster, public opinion in Germany was already split on nuclear power, but the aftermath of the event added enough opposition to reach a tipping point in Germany's nuclear policy. If increasing in severity or frequency, heatwaves, wildfires, famines and major city flooding events could trigger similar regulatory responses at regional and national level.

Plenty of energy

OIL AND GAS: US TARIFFS COST PRESSURE THREATENS SECTOR SLOWDOWN

President Donald Trump's Section 232 import tariffs on steel (25%) and aluminum (10%) in March last year were well-received by the US steel sector, but less so by the country's oil and gas sector.

Beijing threatened retaliatory tariffs on US crude oil and LNG imports from the US, and the import tariffs precipitated a so-called "trade war."

The American Petroleum Institute highlighted the fact that multimillion dollar projects that had already inked supply contracts with European steelmakers had become more expensive.

The Independent Petroleum Association of America said imposing quotas on imported steel would be much more damaging to the independent exploration and production industry than applying tariffs to the materials.

According to IPAA, the E&P industry relies heavily on imports for two classifications of steel products: OCTG (Oil Country Tubular Goods) and line pipe (LP). These classes of steel products typically account for 10% to 20% of well development costs.

"These steel products include OCTG such as carbon-steel casing and alloyed steel tubing that build and complete the wellbore and LP that is both carbon steel and alloyed steel used to move oil and natural gas on the surface of the well site and for transport off the well site to pipelines or storage," a recent IPAA report says.

Ed Longanecker, president of the Texas Independent Producers and Royalty Owners Association, told S&P Global Platts by email that tariffs ultimately result in a 25% to 30% increase in the cost of such products, with quotas increasing costs by as much as 43% due to limited supply.

"Ultimately, the tariffs will result in a slowdown in exploration and production activity and infrastructure projects, job loss and decreased tax revenue," he said. "This is one of the top priorities facing the Texas oil and natural gas industry today."

By contrast, the American Line Pipe Producers Association argued against any steel exclusion requests filed by pipeline operators looking to avoid the 25% US tariff.

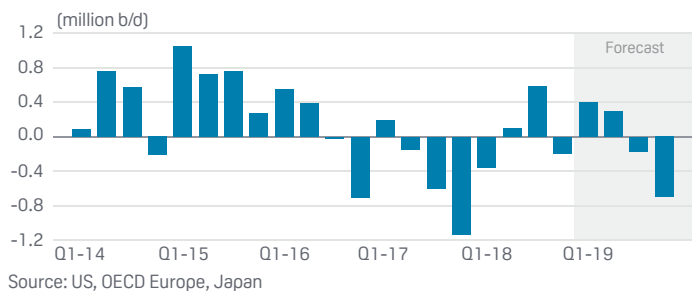
"The US large diameter welded pipe industry is now operating at a capacity utilization rate of well under

S&P Global Platts Analytics: Oil balanced in 2019, with Brent prices trending higher in 2020

Global oil demand growth is expected to slow to 1.5 million b/d in 2019 from 1.7 million b/d a year earlier due to more subdued economic growth in the two most important demand centers, US and China, and lower global trade. Platts Analytics projects global GDP will grow by 3.31% in 2019, slowing from 3.65% in 2018. We also forecast a significant, albeit temporary, slowdown in petrochemical growth this year, in particular for ethane. On global oil supply, we see growth slowing to 1.1 million b/d in 2019, a steep slowdown from growth of 2.5 million b/d in 2018, on indications of weaker drilling activity by some operators in US shale, lower production from Venezuela, reduced expectations of exports from northern Iraq and a prolonged outage in Libya. Further, Iran sanctions will take 1 million b/d of supply off the market, and there are Canadian production curtailment mandates. We have raised Saudi Arabian and other core OPEC output forecasts for the second half of 2019 on rising seasonal demand.

Overall, the dramatic slowdown in supply growth and steady demand growth will keep oil markets largely balanced and broadly constructive through 2019, with normal H1 builds and large draws in H2. Platts Analytics expects Dated Brent prices to hover around \$60/b through H1. We see Brent prices increasing into the \$70s/b late year on rising seasonal demand in H2, the potential for stronger US enforcement of Iranian sanctions with the end of the 180-day period, and impending IMO bunker fuel specification changes that will tighten demand for light sweet crude particularly in 2020. On an annual basis, we expect Brent prices to average \$68/b in 2019, down from \$71/b in 2018, before rising to \$72.50/b in 2020.

MAJOR OECD TOTAL COMMERCIAL OIL STOCK CHANGES



TARIFFS AND WEAKER OIL PRICES A CHALLENGE FOR NEW DEVELOPMENTS



40% and is ready, able and eager to supply any pipeline operator if given the opportunity to do so,” the association said.

Following the imposition of the tariffs in March, prices for oil country tubular goods — seamless rolled-steel products consisting of drill pipe, casing and tubing — soared by nearly 30% in some cases, while line pipe expenditures jumped by 10% to 20%.

Some relief

In November, President Trump signed a proclamation that would allow the Department of Commerce to provide targeted relief from quotas on steel and aluminum imports imposed under Section 232 of the Trade Expansion Act of 1962, the US Commerce Department said.

Representatives of the oil and gas upstream industry praised the move.

Currently, South Korea, Argentina and Brazil are subject to a quota for exports of steel to the US. Argentina is also subject to a quota for US imports of aluminum.

Companies could seek an exemption from quotas in instances when a steel or aluminum product is not available from a domestic supplier in sufficient quantity or quality.

In a limited number of cases, if steel articles that are being used in a facility construction project in the US were contracted for purchase prior to the decision to impose quotas, but cannot presently enter because the US quota has already been reached, an exclusion to the quota may be granted, Commerce said.

The new policy could provide some relief for exploration and production companies because the industry segment is a big consumer of the type of steel products supplied by the three countries. These are products such as tubular pipes that are used for well casing.

The presidential proclamation is expected to also have significant impacts on the natural gas pipeline industry, since South Korea is a very big player in the pipeline steel market, although Argentina and Brazil are more modest exporters.

Last year steel product imports from South Korea included about 1.05 million metric tons of products classified as “oil country goods,” 666,414 mt of line pipe and 151,159 mt of standard pipe.

Over the same period, steel product imports from Argentina included 192,654 mt of oil country goods, 6,487 mt of line pipe and 1,223 mt of standard pipe, and from Brazil 154,515 mt of oil country goods, 46,324 mt of line pipe and 1,574 mt of standard pipe, according to Commerce Department trade data.

One major project was impacted by the US administration’s doubling of tariffs to 50% on Turkish steel imports in August 2018, due to the devaluation of the Turkish lira.

This was seen as placing additional financial pressure on Kinder Morgan’s proposed 1.98 Bcf/d Gulf Coast Express Pipeline and dampening prospects for future US natural gas projects.

Houston-based Kinder Morgan, which moves more than a third of the gas consumed in the US, is sourcing 144,000 mt of steel pipe from Turkish producer Borusan Mannesmann to be used for Gulf Coast Express.

A Kinder Morgan spokeswoman declined to say at the time if the import tariff decision regarding Turkey would delay or imperil Gulf Coast Express.

“We continue to be concerned that these sorts of trade actions threaten important energy infrastructure projects and ultimately hurt American consumers and businesses,” the Interstate Natural Gas Association of America said in a statement.

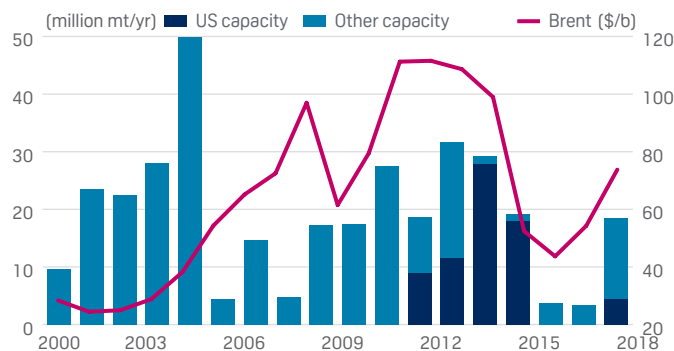
Turkey was a major exporter of rebar used for construction to the US but its exports to the US fell by 50% to 305,370 mt over January-October 2018 due to the Section 232 tariffs. Following the doubling of tariffs on Turkish steel in August, rebar shipments to the US stopped altogether by September.

LNG PROJECT FINANCING ENTERS NEW PHASE

An evolution in the way LNG is bought and sold is increasingly creating financing challenges for new liquefaction projects.

After being underpinned by long-term oil price-linked contracts with strong-credit buyers for several decades, LNG liquefaction project financing is entering a new phase

LIQUEFACTION CAPACITY TAKEN FID BY YEAR



Note: 2018 data above only considers January-October 2018. Source: S&P Global Platts Analytics

LIQUEFACTION PROJECTS FIDS SINCE JANUARY 2015

Project name	Country	Project capacity under 5 (million mt/year)	Expansion project?	Predominant Buyer type	Predominant contract type
Coral FLNG	Mozambique	Yes	No	Portfolio player	FOB
Tangguh train 3	Indonesia	Yes	Yes	End users	DES
Corpus Christi train 3	US	Yes	Yes	Portfolio players and end users	FOB
LNG Canada	Canada	No	No	Portfolio players and end user	Equity marketing

Note: Portfolio players includes traders.

Source: S&P Global Platts Analytics

as a growing number of new buyers are lower-rated and seeking flexible terms.

This has spurred proposals for new financing solutions, including more flexible lending terms, larger equity investments and the increased use of hedging.

The LNG industry has traditionally relied on 20-year supply contracts priced against crude oil benchmarks and delivered mainly to credit-worthy North Asian utilities that could easily pass on the cost of LNG imports to buyers in highly regulated downstream monopoly markets.

This is changing markedly as the industry expands and becomes more liberalized across the supply chain.

Moves to deregulate downstream gas and power sectors have led to more competitive and diverse domestic sectors, increasing the need for risk management and delivery flexibility in LNG supply agreements.

This has reduced demand for long-term, oil-linked and destination-restricted LNG contracts in favor of deals that are shorter, smaller and more flexible.

While LNG term contracts are largely priced against oil, LNG spot benchmarks are increasingly underpinning not only spot negotiations but also long-term contracts.

LNG is difficult to hedge relative to gas because liquidity remains limited, although it is growing rapidly. Further, most of the demand growth is coming from less credit-worthy buyers, which increases the risk for project lenders.

All of this has increased the number of LNG contract renegotiations and disputes in the region, as importers are no longer selling the re-gasified LNG into regulated gas monopolies, but instead into increasingly competitive multiplayer environments with greater exposure to LNG spot fundamentals and prices.

Expensive infrastructure

The commoditization of LNG is presenting enormous challenges for an industry that requires huge and very expensive infrastructure projects – from liquefaction plants and LNG vessels to import terminals, distribution pipelines and gas-fired power plants.

S&P Global Platts Analytics: New LNG supply pricing decoupling from Brent

LNG liquidity is expected to grow significantly over the next several years on the back of new supply from the US. Total LNG supply has been growing rapidly over the past few years, with most of the new supply coming from Australia and Russia.

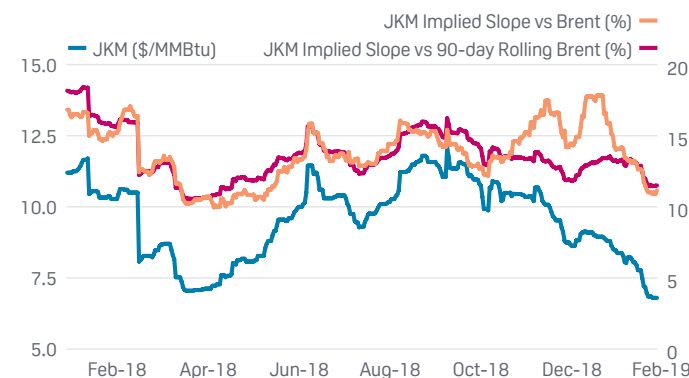
The US represents an important addition to the supply stack as its volumes are not only priced against natural gas prices in North America (namely, Henry Hub), but also because volumes from US terminals are not restricted to specific destinations. This is expected to have a direct impact on LNG pricing and increase commoditization.

One of the key developments that S&P Global Platts Analytics expects to see is a dislocation between JKM (Japan Korea Marker) spot prices in Northeast Asia and the traditional linkage to Brent. Traditionally, JKM prices tended to trade close to oil price parity during times of high demand, such as in winter.

However, as new forms of supply which are agnostic to oil prices hit the market over the next few years, these relationships are expected to break down. During 2019 and 2020, we expect JKM prices to start trading in a smaller implied slope relative to Brent. In fact, this is already starting to materialize, as JKM prices have recently fallen to all-time lows relative to Brent prices for this time of year.

This is something we expect to see moving forward as natural gas prices around the world become increasingly correlated; and this development would be applicable to supply from Henry Hub, TTF (Title Transfer facility) in Europe and on a JKM basis in Asia.

JKM IMPLIED SLOPE vs BRENT



Source: S&P Global Platts Analytics

However, new financing solutions have been proposed recently: More flexible lending terms, larger equity investments by offtakers and more creative hedging mechanisms.

For example, Canada LNG's Final Investment Decisions in October 2018 was underpinned by the project partners – mostly portfolio players – which each marketed their own LNG shares.

This shows how LNG portfolio players are playing a more active role in securing new liquefaction project financing.

This year will be an important year for LNG infrastructure, with several export projects in Russia, Qatar, Mozambique and the US targeting financial close by the end of 2019.

On the import side, China is eyeing a significant expansion of its LNG import capacity over the next decade, as operating rates at existing terminals continue to increase on growing LNG consumption.

New terminals are also being built across South and Southeast Asia, where most of the demand growth is coming from.

Small-scale and breakbulk facilities will also be needed to meet the gas demand from island nations like the Philippines and Indonesia.

On the distribution side, pipelines in Indonesia, Bangladesh, the Philippines, Sri Lanka, Vietnam and Myanmar and others places will need to be built, mainly from scratch — most of the delays in import projects in India and Bangladesh are due to pipelines not being built on time.

PETROCHEMICALS: POLYMER USE IN CONSTRUCTION GROWS AMID RUMBLINGS IN GLOBAL TRADE

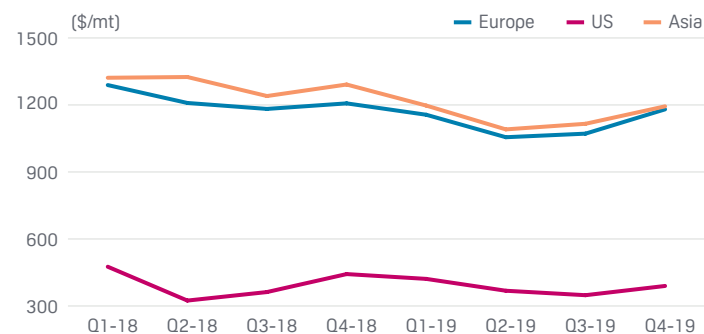
The construction industry polymer market is expected to surge over the next 5-10 years – estimates vary from 5%-8% CAGR – on the back of more advanced construction and engineering technologies.

Polyvinylchloride (PVC) polymer demand has been booming as developers seek the material for its strength and versatility, along with its fire and water proof qualities.

Polymer usage in the building and construction industry is seeing trade and growth patterns change in 2019, impacted in particular by the trade tensions between the US and China.

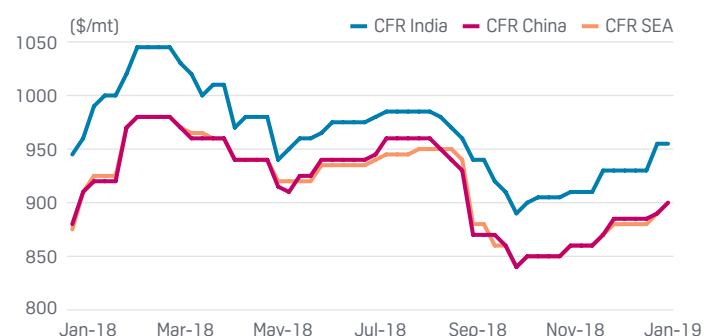
While this is not attracting the same attention as the impact on steel, it's worth noting that over 85% of all

GLOBAL ETHYLENE PRICE FORECASTS



Source: S&P Global Platts Analytics

ASIAN PVC SPOT PRICES



Source: S&P Global Platts

polyvinyl chloride consumption in Australia, for example, is in the building and construction sector, according to manufacturer Australian Vinyls.

Despite the macroeconomic headwinds, global demand for PVC, which is used to make pipes, window frames, vinyl siding and flooring, is seen growing in line with bullish demand from the construction sector and is expected to increase to 46.12 million mt by 2021, up 7.4% from 2018, Japan's Ministry of Economy, Trade and Industry has forecast.

South Korea's PVC exports rose 13.7% year on year in 2018 on strong demand from South Asia, notably from India and Bangladesh, while demand from China slowed.

The country's PVC exports to India jumped 37.9% on year to 388,643 mt in the year, while exports to Bangladesh surged 142% to 13,089 mt, latest customs data showed. But its PVC exports to China dived 45% in the year, reflecting an economic slowdown there.

The price spread between PVC and feedstock vinyl chloride monomer is expected to remain above the typical breakeven level of \$150/mt in 2019. The PVC/VCM price spread in Asia averaged \$195/mt in 2018, unchanged from a year earlier and comfortably above the breakeven level.

US-origin PVC was dropped from China's revised list of tariffs that took effect on August 23, but ethylene dichloride, a precursor to PVC, remained on the list. Linear low density polyethylene and high density polyethylene were also on the list.

PVC demand is more heavily tied to economic health than more consumer-oriented resins such as polyethylene.

China has an overall PVC production capacity of 16 million-17 million mt/year but operating rates typically hover around 45%-50%. Locally made PVC is derived from two methods depending on the VCM source; one is carbide-based, the other ethylene-based.

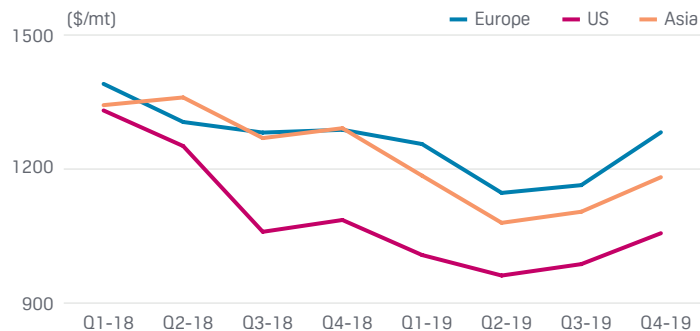
China's carbide-based PVC production could fall in 2019 as the country has tightened safety regulations for vinyls production after an explosion at chlor-alkali producer Hebei Shenghua Chemical's plant in Zhangjiakou on November 28 last year killed at least 22 people and injured several others.

Indirect support for Asian PVC is forecast from the caustic soda spot market, which is expected to rebound in the first quarter of 2019 as Japan's exports to India normalize following a slump over January-October 2018.

Chemically speaking, caustic soda is a byproduct of chlorine production. Chlorine combined with ethylene makes ethylene dichloride, while caustic soda is a key feedstock in the alumina and pulp and paper industries.

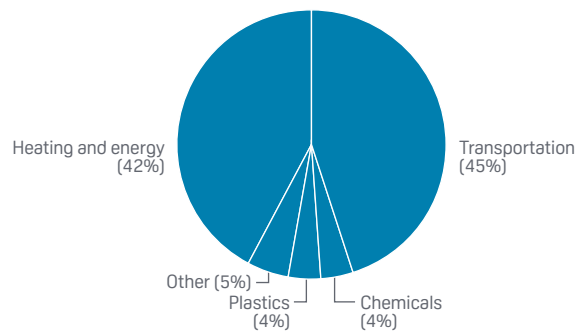
Trading activity in Asia's EDC market is expected to change amid the US-China trade war, as 25% tariffs were slapped on EDC of US origin. China relies heavily on US-origin EDC, which accounts for 70% of its total EDC imports, customs data showed.

GLOBAL HDPE PRICE FORECASTS



Source: S&P Global Platts Analytics

OIL AND GAS USAGE



Source: British Plastics Federation

US polymers fueled by cheaper feedstock

Asian ethylene market participants were not too concerned about a Chinese tax on US product, as US-origin ethylene prices would still be comparatively low.

The cost of ethylene, a raw material for PVC production, is falling as the US produces more shale gas. The US-China trade war has to date had little impact on ethylene due to limited US exports to China.

Ethylene prices face downward pressure in 2019 from new and delayed production capacities. The US ethylene market had been slated to see 5 million mt/year of ethylene capacity come online in 2018, but only Chevron Phillips' Cedar Bayou complex in Baytown, Texas, and ExxonMobil's Baytown cracker, with a combined capacity of 3 million mt/year, commenced commercial ethylene production in the year.

Producers optimistic on Chinese demand

Other construction-related polymers expanded polystyrene and polyethylene could be affected by ethylene, as both use it as a raw material.

Global styrene monomer trade flows evolved after China imposed antidumping duties on imports from South Korea, Taiwan and the US. As a result, countries affected by the tariffs have been shipping more cargoes to Europe, India and Southeast Asia.

Europe could benefit from the shipments as its expandable polystyrene demand is expected to rise 2%-2.5% as the construction sector picks up in 2019, market sources said. "EPS will grow in line with GDP growth," a producer said.

EPS, a lightweight foam resin, is used in its fire retardant grade in insulated concrete foam, building insulation and lightweight concrete.

S&P Global Ratings: Top trends for building materials in North America and EMEA in 2019

NORTH AMERICA

Macroeconomic fundamentals healthy, but risk increasing

In the US in 2019, we expect 2.3% real GDP growth, 3.6% unemployment and 1.3 million housing starts.

We expect mid-single digit growth in repair and remodeling activity and only 2.8% growth in nonresidential construction, with infrastructure spending to be flat.

These modestly positive fundamentals indicate another year of improved sales and earnings for building materials companies, but with much less growth than in 2016 and 2017, as the long slow recovery in housing appears to have plateaued.

Recent housing data indicates a possibility that housing starts could even retreat slightly in 2019 due to affordability issues and the high price of new homes. However, we think builders will attempt to address this by offering more value-based entry-level housing.

Commodity cost inflation, mix changes could pressure margins

After two years of reasonable input costs, labor and commodity costs rose in 2018 as the economy reached full employment, tariffs set in and demand for products increased.

So far, most building materials companies have been able to offset the cost increases with higher pricing, but it remains to be seen if companies can continue to maintain

higher prices in 2019. Some commodity costs should temper in 2019, particularly wood which is coming off record high prices in 2018, steel and other metals, and oil and oil-based products.

Still, labor remains expensive and companies are seeking to automate wherever possible. We are projecting about a 3% increase in materials costs in our forecasts.

Also, as building products become more expensive, there is the possibility that users will shift down to less expensive mid- and low priced items, particularly in finished building materials such as faucets, kitchens, windows and carpets, in order to maximize value.

This could result in a less favorable sales mix and slightly lower margins for some producers.

High home prices and reduced affordability of existing homes could bring the building materials recovery to a halt

For the three months ended August 31, 2018, housing sales and permits moderated in the US because of low inventory and high home prices.

This, along with higher interest rates, may be pushing marginally qualified buyers out of the market.

If this trend continues, we could see housing starts decline below the 1.3 million units assumed for 2019.

Existing home sales, a big driver of repair and remodel activity, could also slow if values remain high and available inventory low.

This would have a ripple effect on building materials and 2019 could be the year the decade-long slow-charging recovery from the 2007 housing crash actually stalls.

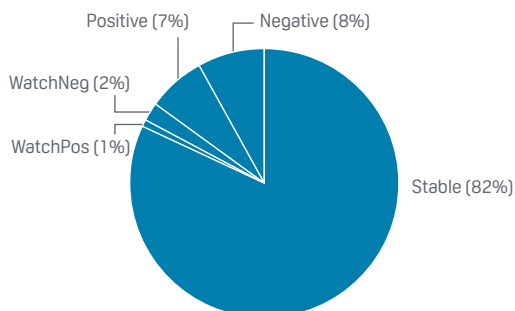
Higher interest rates

Higher interest rates will not only squeeze some marginal buyers out of the new home market (mortgage rates are assumed to go to 5.1% in 2019), but may also crimp consumer borrowing on home equity lines for major repairs and renovations.

While we believe full employment and wage growth may blunt the impact of higher rates, the higher overall cost of new homes and renovations may cause consumers to trade down to buy more modest homes, forgo upgrades and make less expensive renovations.

This would likely have a negative mixed effect on product margins for building materials as a shift occurs from higher margin premium products to mid-range offerings with less profit.

CREDIT RATINGS OUTLOOK: BUILDING MATERIALS COMPANIES



Source: S&P Global Ratings

EMEA

Construction output growth should slow in 2019-20

Most European markets continue to gradually recover, but at a slowing pace, in parallel with lower GDP growth in Europe of 2.3% in 2018 and 1.7% in 2019 and 2020, compared with 2.8% in 2017.

According to Euroconstruct, European construction output will grow 2.7% in 2018, down from 3.9% growth in 2017. Growth should continue in 2019 and 2020, but at a slower rate, below 2%, and construction should no longer be the European engine of growth.

In particular, we expect a growth deceleration of new housing construction, and a shift to civil engineering construction, reflecting some infrastructure renovation programs announced in continental Europe. European construction growth is broad-based, but with significant differences at the country level.

We expect Eastern Europe to post higher growth than Western Europe on average. Particularly, we expect very limited growth in Germany and the UK in 2019-2020. We also anticipate stable or moderately growing prices in the region, in line with CPI.

Most building material companies that we rate benefit from diversified geographic exposure outside Europe, namely in the US and APAC, and will likely continue posting better trading performance through 2018-2019 compared with companies with local exposure

Energy inflation will likely limit margin progress in 2019-2020

In 2018, most EMEA building material players have managed to somewhat protect their margins from energy inflation costs at around 10%, thanks to the benefits of cost synergies coming from M&A made in 2015-2016, cost-cutting programs and modest price increases. We anticipate an average EBITDA margin of 13.9% in 2018, 20 basis points higher than in 2017.

However, we expect a modest decline for those companies with high energy consumption. In our base-case scenario for 2019 we assume energy inflation still at around 10% and an overall cost inflation of between 3% and 4%.

We believe that additional room for cost optimization measures is pretty limited in the next couple of years, and companies may be unable to fully pass cost inflation through to end consumers ahead of slowing volumes.

As a result, we forecast that margins at best will remain stable in 2019 but, as with 2018, we could observe a moderate decline for companies with significant energy cost consumption, such as cement producers, or with exposure to emerging countries with excess production capacity.

Political uncertainty and Brexit

Political uncertainty continues to be a major theme for building companies we rate and is partly responsible for driving the foreign exchange volatility that has been affecting their financial results.

In particular, the uncertainty from political volatility in countries where some issuers have material exposure, such as Algeria, Egypt and Turkey, may drive further foreign exchange volatility through 2019.

The exchange rate fluctuation between the US dollar and the euro that we have observed in 2017-2018 also adds volatility to company results, given the significant exposure on average to the US market.

We believe that most companies with exposure to the UK will not face cross-border servicing or logistics issues in the case of a disruptive Brexit in March 2019.

However, local demand for building products will likely remain weak ahead of poor consumer sentiment.



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BUILDING THE WORLD

US

San Francisco's Golden Gate Bridge was built using 83,000 mt of steel in 1937.

Built in 1930-1932, the Empire State Building in New York was the first building in the world to use a significant amount of aluminum in fabricated structures. In 1994, some 5,460 leaking steel windows were replaced with aluminum frames.

UK

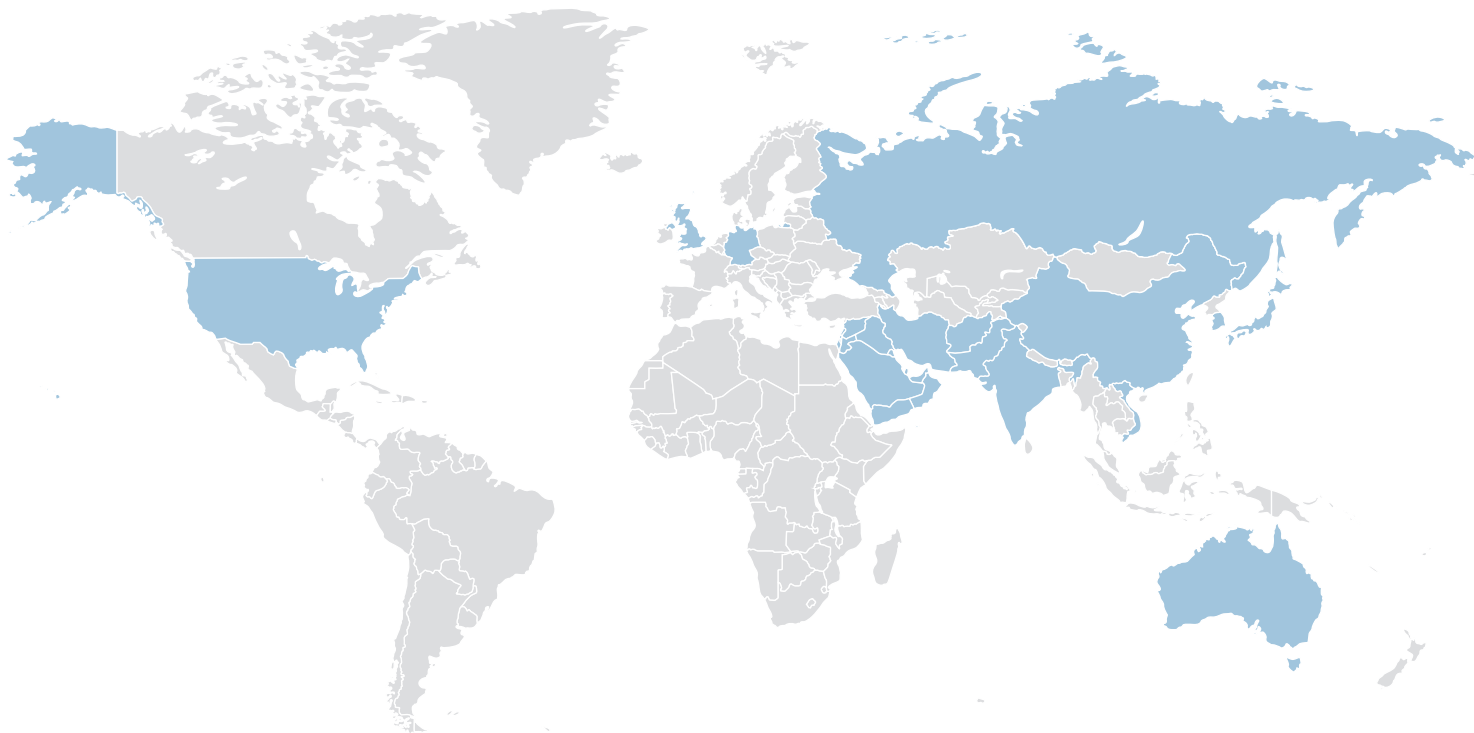
It has been estimated that buildings in the UK consume 50% of the country's total energy usage, and use 400 million mt of materials which contribute 10% of carbon emissions. (Source: Institute of Civil Engineers).

Germany

Germany's construction sector is forecast to grow by 6% in 2019 to Euros \$128 billion (\$145 billion), supported by 320,000 new homes. (Source: ZDB and HDB construction associations).

Russia

The value of Russia's construction sector is expected to grow by 1.6% CAGR over 2016-2021. Moscow plans to invest Rubles 11.6 trillion (\$177 billion) in new transport infrastructure over this period.



Middle East

Standing at 829.8 meters (2,722 feet), Dubai's Burj Khalifa used 31,400 mt of steel rebar to reinforce 330,000 cubic meters of concrete.

India

The government estimates that India will need \$4.5 trillion over the next 25 years to build its ambitious infrastructure program. India plans to increase the road network to 5.717 million km by 2040 from 3.373 million km in 2001.

Japan

Investment in construction in Japan peaked at about Yen 84 trillion (\$771.4 billion) in fiscal 1992 and has remained at Yen 40 trillion-50 trillion ever since (Source: Research Institute of Construction and Economy).

South Korea

Construction investment in South Korea fell 4% year on year in 2018 and will remain in negative territory until 2020, the Bank of Korea said in January.

China

Designed for the 2008 Olympics, Beijing's "Birds Nest" Stadium used 42,000 mt of steel to construct the distinctive outer shell. Total weight of the construction materials, including seating, was 110,000 mt.

As part of a wave of measures to support China's property sector, **Wuhan** has allowed local residents to purchase housing in the city using public housing funds saved outside of the city.

Vietnam

Vietnam wants the construction sector to account for around a third of GDP by 2020. Under a government plan, more than a quarter of the country's jobs will be in the construction sector.

Australia

Sydney Harbour Bridge, which was built with 53,000 mt of steel in the 1920s, can expand by 18 cm on a hot day as the steel heats.

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Focus on Asia

CHINA

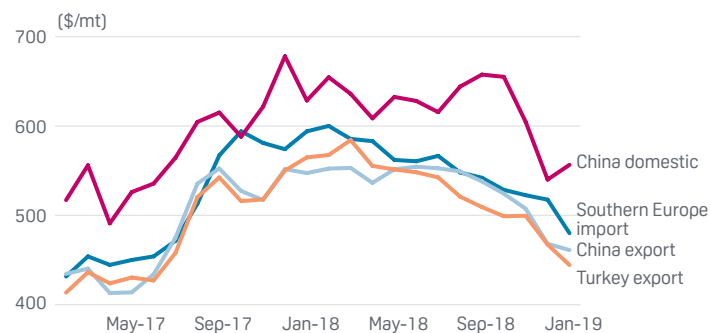
Why the construction section needs to watch China closely

China's real estate sector is a bellwether for the health of the Chinese economy as a whole, and is a huge driver of energy and commodities demand. Within a few decades, China has gone from a country where no one owned their homes to having the highest rate of property ownership in the world. Some 20% of households now own more than one property. As well as the materials required to build houses and apartments, they also need to be fitted out with fridges, washing machines, air-conditioning units, vacuum cleaners and PVC windows. They need to be heated in winter and cooled in summer. Downstairs, one or two cars sit in the garage. All of these items are highly metals and energy-intensive.

In 2018 China produced 928 million mt of crude steel and exported 70 million mt. To feed its steel industry it imported more than 1 billion mt of iron ore. More than half of the steel China consumes ends up in apartments and houses, as does much of the copper, plastics and other materials. Real estate and infrastructure combined accounted for 388 million mt out of total steel consumption of 618 million mt in 2017, according to China's Metallurgical Planning Institute. As a result, the property construction sector has a huge influence on both domestic and global steel and commodity prices, given that China is the world's largest consumer.

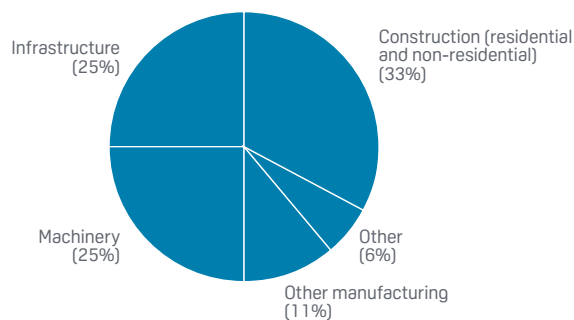
In 2018, steel exports as a proportion of crude steel produced was 7.5%, down from 14% in 2016 when the market was weaker. Despite a strong focus on capacity reductions and mill closures under Beijing's supply-side reform agenda, China still has crude steel capacity of around 1.18 billion mt/year, S&P Global Platts estimates. If domestic demand slows markedly and the property sector contracts, the fear is that exports will return to levels of 100+ million mt seen over 2014-2016. During this period, many global steelmakers were brought close to bankruptcy, unable to compete with low import prices.

GLOBAL REBAR PRICES



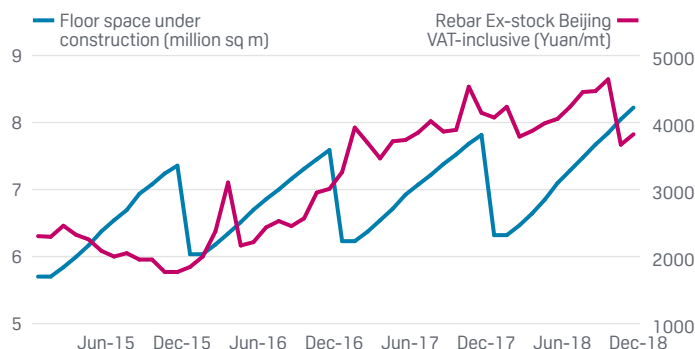
Source: S&P Global Platts

CHINA'S STEEL CONSUMPTION BY END-USER SEGMENT



Source: S&P Global Platts, CISA, analyst reports

FLOOR SPACE UNDER CONSTRUCTION vs REBAR PRICES



Source: S&P Global Platts, NBS

Property market investment increased by 9.5% to Yuan 12 trillion (\$1.8 trillion) in 2018, of which 70.8% came from residential property, up 13.4% on year to Yuan 8.5 trillion. Floor space under construction last year went up 5.2% on year to nearly 8.2 billion sq m, while housing starts increased by 17.2% on year to 2 billion sq m, according to the National Bureau of Statistics.

Property sector may have peaked: S&P Global Ratings

According to S&P Global Ratings, China's property market has peaked and prices of apartments and houses could fall by 5% in 2019, as developers get squeezed by tighter financing and the impact of a weaker currency. This is potentially bad news for the steel market, in particular, as property construction was the strong performer in 2018, helping to offset weaker infrastructure investment and slower manufacturing activity. S&P Global Ratings expects the property sector to contract by 8%-12% in 2019. Less efficient and liquid developers may be forced to offload their housing projects to larger companies for quick cash sales.

China has worked its way through steep housing inventories in recent years, particularly in lower-tier cities. But it is the smaller cities that are likely to feel the brunt of the downturn this year, as large east coast cities have fewer empty apartments and more people that want to live in them.

Tighter debt controls

Since the financial crisis China has been increasingly reliant on debt to maintain economic growth. At the start

of 2009 Chinese credit to the non-financial sector – debt owed by the government, households and companies – was slightly more than one and a half times the size of the economy. By the end of 2018 this had grown by 65% to more than two and a half times GDP

Such was the vulnerability of the economy to this rapid accumulation of debt, that starting mid-2016 the government has been engaging in a process of deleveraging the industrial sector and tightening credit across the economy. Last year saw a particular focus on curtailing lending by China’s shadow banks, financial companies outside the conventional banking sector that engage in bank-like lending activity.

A move to shut down online peer-to-peer lending platforms, a small but fast growing part of the shadow credit sector, has also constrained consumer access to finance. With analysts estimating that peer-to-peer lenders financed as much as 15% of new vehicle sales in 2017, the contraction in the sector was a major contributor to the sharp fall in sales in the second half of last year.

Indeed, 2018 was the first year in decades that new car sales were down on the previous year, impacting demand for flat steel and gasoline. With the government announcing that it will not provide relief to the auto sector by cutting purchase tax for passenger vehicles as it did in 2015, gasoline demand is expected to continue to be weak. S&P Global Platts Analytics expects Chinese gasoline demand to grow at under 3% in 2019, down from 6% in 2017.

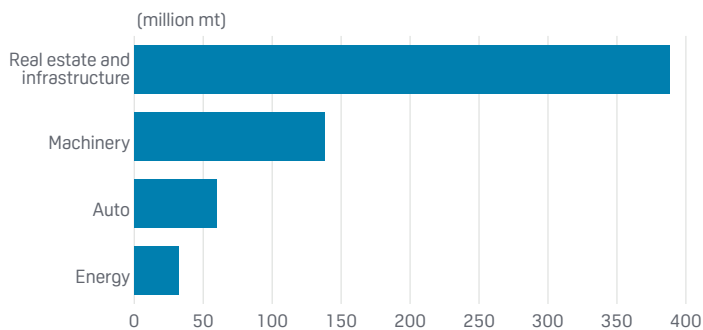
Real estate to the rescue

Given this backdrop, it was somewhat surprising that the property market was so resilient for much of last year. With the clampdown on P2P lending platforms and a 30% fall in the Shanghai Composite index, money flowed into investment property in 2018, especially in smaller cities where there are fewer restrictions on purchasing investment properties. But with prices softening and home sales falling, the outlook is less optimistic for 2019. This appears to have been priced into the steel market where the price of construction rebar has fallen by nearly 20% since the end of October.

Beijing has announced a range of tax cuts to support the economy, especially small businesses. Some tinkering around the edges to support the property sector, like the lifting of some of the restrictions on secondary property purchases in larger cities, also seems likely. And policies to increase passenger cars and white goods are also imminent, according to comments by an official from the National Development and Reform Commission quoted by Chinese media.

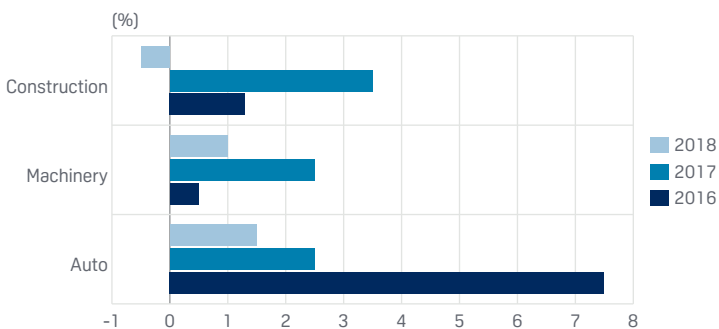
In early January, some analysts were calling for stronger measures from Beijing to boost the economy. But the government is likely to tread carefully so as to channel any new lending to support smaller, private sector enterprises, not fuel a speculative property bubble as it did in 2012 and 2015.

FORECAST STEEL CONSUMPTION BY SEGMENT IN 2018



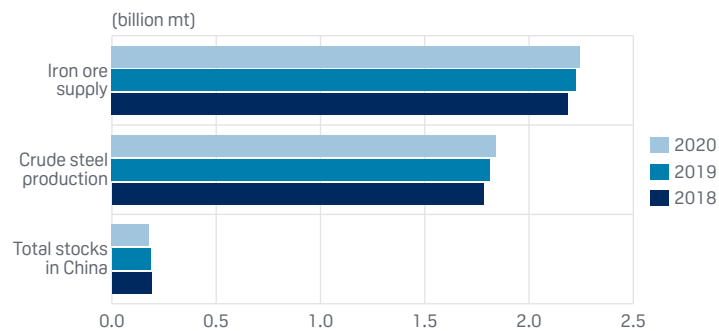
Source: MPI

CHINA STEEL USING SECTORS DEMAND GROWTH



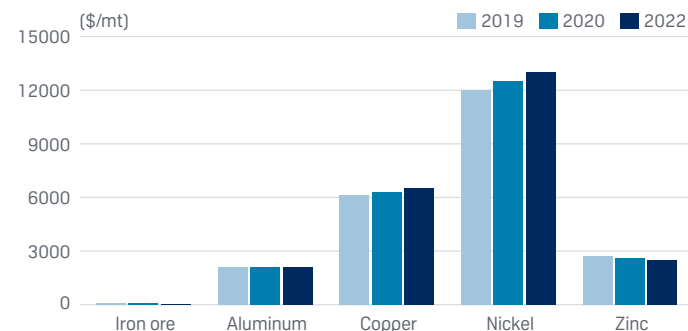
Source: Worldsteel

IRON ORE SUPPLY-DEMAND BALANCE



Source: S&P Global Market Intelligence

S&P GLOBAL RATINGS’ METALS PRICE ASSUMPTIONS



Source: S&P Global Ratings

The question is whether the government can stay the course on its debt reduction goals. An early resolution of the trade dispute with the US would certainly provide some relief to the economy and help mitigate some of the spillover from the tighter credit conditions.

Infrastructure tipped to rebound this year

Investment in infrastructure construction rose by 3.7% on year in the first eleven months of 2018, a big slowdown from the 19% growth rate in 2017. Some optimistic industry analysts believed the investment growth rate may recover to close to 10% in 2019. Growth was slower last year due to the central government's determination to crack down on illegal funding and prevent major financial risks.

Beijing also moved to tidy up the Public-Private Partnership program and by April had removed a total of 1,695 “unqualified” projects worth Yuan 1.8 trillion (\$0.28 trillion). This accounted for about 10% of the overall PPP program. Meanwhile, another 2,005 PPPs with a value of Yuan 3.1 trillion were earmarked for “rectification.” The reasons for removed and suspended projects were insufficient preparation work, lack of studies on debt payment capacity, and illegal funding.

The State Council and Ministry of Finance have both said they will speed up fiscal expenditure and shorten the project approval time to facilitate infrastructure sector development. China's National Development and Reform Commission approved eight major infrastructure projects involving railway construction in December 2018 with a total investment of Yuan 930.2 billion (\$137.3 billion). This surpassed the combined Yuan 813.7 billion investment in infrastructure projects approved over January-November 2018.

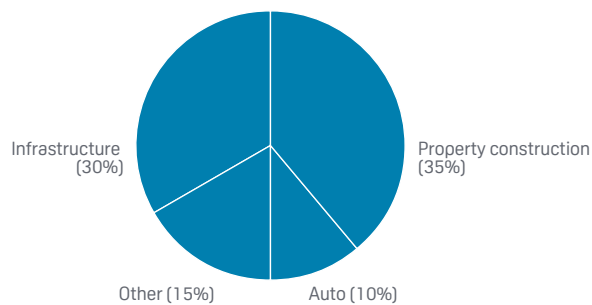
China's local governments were due to start issuing 2019 local government bonds in late January, about four months earlier than in 2018, in a bid to speed up investment in infrastructure.

INDIA

For visitors to the bustling Indian city of Mumbai, infrastructure improvements are not immediately apparent. Work on the Mumbai metro system is clearly evident, but is usually glimpsed from a near-stationary taxi, stuck in the city's relentless traffic. Ambition and frustration are neatly encapsulated by this experience. Long delays in construction projects are commonplace, with some housing developments taking more than seven years longer than originally planned to complete. Half-finished apartment blocks with rebar sticking out and seemingly semi-dormant capital projects are also common sights in India.

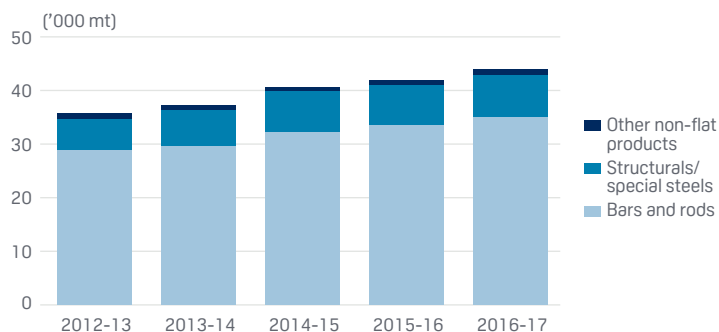
India is undergoing a huge infrastructure revolution, driven by increasing urbanization and strong economic growth. Roughly two-thirds of the country's population is considered to be rural. S&P Global Ratings has forecast that India's GDP will grow at 7.4% in fiscal 2019.

INDIAN STEEL CONSUMPTION BY SEGMENT



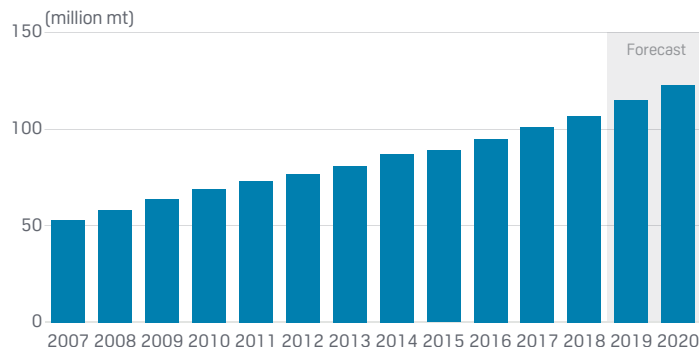
Source: S&P Global Platts

PRODUCTION OF LONG STEEL PRODUCTS IN INDIA



Source: JPC

INDIAN CRUDE STEEL PRODUCTION FORECAST



Source: WorldSteel, S&P Global Platts

Unlike China, which has an aging population, India has demographics on its side with an average age of just 27. The United Nations projects that India will add some 416 million urban dwellers by 2050. They will need apartments and houses to live in, cars and fridges. This bodes well for steel and commodities demand and consumption over the longer term.

The majority government of Prime Minister Narendra Modi has placed great emphasis on developing the country's infrastructure and building affordable housing. There is tremendous upside for the construction sector. Spending ahead of the 2019 general election has propelled major transport and railway projects.

But as is the case with many things in India, patience is required. One of the major challenges that India faces

is how to finance the country's ambitious infrastructure program. Previous governments have tried to go down the Public-Private Partnership route to little avail. The private sector is largely sitting on the sidelines, meaning the public sector will need to somehow shoulder most of the funding burden. But India does not have the deep pockets of China and therefore nobody is quite sure how the ambitious program will be paid for. Some industry analysts estimate there will be a funding shortfall of around 30% over the medium term.

According to a construction survey carried out by RICS in Q3 last year, financial constraints were identified by most respondents (80%) in India as holding back activity. Some 70% and 73% cited competition and insufficient demand as negative factors. More than 50% of respondents said the cost of materials, planning and regulation, and labor shortages were also restricting activity.

Infrastructure and construction is expected to be one of the main drivers of demand for steel and other commodities in coming years. S&P Global Platts estimates that India's crude steel production will reach 125 million mt by 2020, a 21% increase from 2017. Pig iron output could increase to 81 million mt, from 66 million mt reported for 2017. On this basis, metallurgical coal demand is expected to reach 70 million mt by 2020, most of which will be imported from Australia.

According to a presentation by S&P Global's Indian subsidiary CRISIL Research at the Platts Steel Markets Conference in Mumbai in November, the building and construction segment accounts for 35%-40% of Indian steel consumption and is expected to grow by around 4.5%-5.5% annually. Infrastructure development has a 20%-25% share and is expected to grow by 8%-10% annually. Demand will be supported by rural housing, the urbanization of Tiers 3&4 cities, new highways and other initiatives.



Signs of safety at Mumbai metro work. Source: S&P Global Platts

The government in New Delhi is investing heavily in developing infrastructure, including real estate. The infrastructure sector is now considered to be the country's second-largest employer after agriculture and in the 2018 union budget around Rupees 5.97 trillion was earmarked for investment.

According to the Confederation of Real Estate Developers' Associations of India, the real estate sector is projected to reach \$180 billion by 2020 from \$126 billion in 2015, almost doubling its contribution to GDP at 11% in the process. Growth will be driven by government policies designed to speed up urbanization, rising household income and the emergence of affordable housing.

Some of the policies and future trends expected to drive growth are:

Real Estate Regulatory Act (RERA)

India implemented a Real Estate Regulatory Act in 2016 to help protect home buyers from builders and developers by bringing greater transparency to the sector. Under RERA, each state and union territory will have its own regulator.

Goods and Services Tax

India introduced a GST system in April 2017, which in the case of real estate replaced a multi-layered taxation system with one unified tax rate. Before GST, the effective tax rate on real estate was around 15% to 18% and no input tax credit was applicable on VAT and central excise duties. This added to the cost for consumers. Builders can now claim input tax credit on construction materials to offset GST liabilities. Last year the implementation of the new tax caused some slowing down of investment as some developers and commodity traders were unsure how inventories would be accounted for under the new tax regime. But the system now seems embedded and is no longer mentioned as a drag on investment.

The market is banking on the government to reduce GST rates for the real estate sector to boost sales and simulate growth. The GST council, which consists of the Union Finance Minister, Union Minister of State in charge of Revenue or Finance, Minister in charge of Finance or Taxation or any other Minister nominated by each state government, has said a panel will be formed to understand the issues relating to the real estate sector. The panel could potentially recommend remedial measures such as a scheme whereby a flat tax rate is levied without any credit on input.

Liquidity crisis

India's real estate sector has emerged from the demonetization program in 2016, tighter regulations and the GST roll-out. However, the liquidity crisis affecting non-banking financial companies (NBFCs) is expected to slow growth as real estate comprises a significant portion of the NBFCs. Any delays in completion of projects will expose developers to penalties under the RERA act. This will in turn affect the financial health of developers.

FDI policy

As a major employer and contributor to employment and GDP, India has been trying to entice overseas investors. Since 2005, 100% foreign direct investment in the real estate sector has been permitted, with certain measures relaxed further at the start of 2018 making it easier to secure approvals. Greater transparency under RERA has helped entice both FDI and private sector investment. According to India's JLL, private equity investment in real estate grew at \$4.7 billion in 2015, \$6.9 billion in 2016 and \$6.3 billion in 2017.

Government schemes

Rapid urbanization has led to development challenges in the form of urban congestion and in securing basic necessities like housing, water and electricity. Developers are focusing mainly on middle to high income segments. To help cater for lower income segments, the Indian government has started initiatives like Smart Cities Mission, AMRUT (Atal Mission for Rejuvenation and Urban Transformation), PMAY-U (Pradhan Mantri Awas Yojana), DAY-NULM (Deen Dayal Antyodaya Yojana-National Urban Livelihoods Mission) and HRIDAY (Heritage City Development and Augmentation Yojana). PMAY, or "Housing for All by 2022," was launched to provide assistance in the provision of houses for all eligible families. By the start of 2018, some 70 million houses had been sanctioned (but not necessarily built) under the PMAY scheme.

Single window clearance

On average, builders have to wait more than two years to start a project, which drives up costs. Implementation of a single window clearance will result in shorter lead times for obtaining construction permits and will in turn lead to fewer delays and possibly lower house prices. Several states like Telangana, Madhya Pradesh and others have already taken these initiatives.

JAPAN

Japan before and after the Tokyo Olympics

Japan's construction sector has been supported in recent years by projects related to the 2020 Tokyo Olympics and Paralympics, along with urban redevelopments. But the outlook is mixed when it comes to near- to medium-term demand. Among major economies, Japan has its own unique challenge: Due to a lack of immigration, the country simply doesn't have enough construction workers.

Steel demand from construction is expected to rise slightly in Japan's 2019 fiscal year (April 2019-March 2020), according to industry experts. Demand in the sector bottomed out in late FY 2016, before improving as Olympics-related projects gathered momentum. The Japan Iron & Steel Federation has forecast that steel demand generated by the Tokyo Olympics will be around 3 million mt.

Most Olympics-related construction is expected to be completed in early 2019, so steel demand from building construction is expected to decline on last year. But steel

JAPAN HOUSING STARTS

	2018 units	Change y-o-y (%)	2018 sq m	Change y-o-y (%)
Jan	66,358	-0.13	5,325	-0.15
Feb	69,071	-0.03	5,444	-0.06
Mar	69,616	-0.08	5,600	-0.07
Apr	84,226	0.00	6,696	-0.02
May	79,539	0.01	6,415	0.00
June	81,275	-0.07	6,510	-0.09
July	82,615	-0.01	6,590	-0.02
Aug	81,860	0.02	6,450	0.01
Sep	81,903	-0.01	6,478	-0.02
Oct	83,330	0.00	6,690	0.02
Nov	84,213	-0.01	6,768	0.01
Total Jan-Nov	864,006	-0.03	68,966	-0.03

Source: Ministry of Land, Infrastructure, Transport and Tourism



Blue skies for construction work around Tokyo. Source: S&P Global Platts

used in civil engineering is expected to be higher, which will support overall construction steel demand.

Ordinary carbon steel orders booked by construction companies over April-November reached 7.71 million mt, up 2.7% year on year, according to the Japan Iron & Steel Federation. Steel used for building purposes accounted for 4.42 million mt, up 4.8% on year, while civil engineering demand comprised 1.59 million mt, up 1.1% on year.

Housing accounted for roughly 30% of building construction steel orders and civil engineering 17% of total construction in 2017, according to the JISF.

Japan's building starts of non-wooden buildings in April-November 2018 were 52 million sq meters, down 4% on

year. Starts of reinforced concrete buildings were 15.05 million sq meters, down 8.4% on year; steel framed building starts were down 0.8% on year at 35.2 million sq meters.

Generally, there is a six-month lag between the first earth being turned on a building project and the steel arriving.

Where are the workers?

Most Tokyo-based construction steel trading firms expect construction work to stay reasonably strong after the Olympics. This is because Japan's shortage of workers led to the deferral of many other construction projects while Olympics-related work was prioritized.

In the most recent census in 2015, the number of construction workers in Japan was 4.34 million, down 3% from 2010, according to Japan's National Census. The number of workers is falling because people are getting older and are leaving the workforce. The shortfall of staff has naturally resulted in higher costs as project developers vie to entice available workers. Some investors have delayed their projects until after 2020 in the hope that labor costs will decrease. Construction labor costs in Tokyo have increased by 10%-20% in the past couple of years, industry officials tell S&P Global Platts.

The shortage of workers is not only confined to construction sites. Steel companies that make structural material for building projects, such as H-beams, also find it hard to get staff. Though most fabricators operate at full capacity, order backlogs pile up and deliveries are delayed. These issues further slow the progress of the construction industry, Platts is told.

The Japanese government is mulling a new foreign worker program to help ease the shortage and has started gathering public feedback on the scheme. This could see more than 345,000 workers come to Japan on working visas over a five-year period to help 14 industry sectors in dire need of workers, of which construction is one.

But industry sources said temporary measures to use foreign workers in Olympics-related construction had not eased the overall lack of construction workers. Therefore, it was too soon to know if the new migrant scheme could potentially help the sector.

ALUMINUM PREMIUM CIF JAPAN



Source: S&P Global Platts

Olympics boosting Japanese aluminum and copper demand

The 2020 Tokyo Olympics is boosting Japanese aluminum and copper demand as the construction of sports facilities proceeds, industry associations said.

Japan's deliveries of aluminum extrusions to the domestic construction sector, used for sliding doors and window frames, totaled 461,865 mt in 2018, down 0.5% year on year. Earthquakes and typhoons slowed work on construction projects in the year, the Japan Aluminium association noted.

In December, deliveries rose by 1.2% to 39,964 mt, the strongest monthly performance for four years. This was attributed to a rise in demand at Olympics facilities, as well as at restoration projects in areas hit by typhoons and earthquakes earlier in the year.

Similarly, copper and brass rod demand stalled in 2018 but positive signs emerged due to the Olympics, the Japan Copper & Brass Association told a news conference in late January.

In 2018, copper rod production was 27,138 mt, down 2% from a year earlier, and brass rod output down 1.6% at 188,520 mt.

Copper rods are used in electric circuit boards and brass rods in gas-fired kitchen equipment, water systems and bulbs.

But demand is expected to strengthen this year as construction speeds up ahead of the Olympics.

The copper association said the country's hot and humid summer was also contributing to stronger demand for copper tube used in air conditioners.

Japan's air conditioner shipments hit a record high last year and strong demand is expected to be sustained as schools and other public facilities are installing air conditioners, said Tetsuji Tajima, research manager of the association.

Japan's copper tube production in 2018 was 113,542 mt, down 2.3% from 2017. The decline was attributed to exports plunging by 18.1% to 14,116 mt. Domestic copper tube demand was stable at 99,426 mt in the year, edging up 0.4% from 2017.

Consumption tax hike impact

Another key factor in Japan's economy this year is the consumption tax increase scheduled for October. Steel traders said the number of new housing starts in 2018 was disappointing and the new tax could see activity deteriorate further this year.

The last time Japan's consumption tax was increased – from 5% to 8% in April 2014 – housing starts noticeably fell. Housing starts in the 2014-2015 fiscal year of 880,470 units were down 10.8% on year, while housing areas dropped by 15.2% to 74.01 million sq meters, according to the Ministry of Land, Infrastructure, Transport and Tourism.

"Japan's government may introduce some economic measures to boost consumption to help offset the impact of the tax rise. But this would only be for a limited period, and it could take several years for housing to start increasing again," a steel trader in Tokyo said.

SINGAPORE

Public projects agenda underpins construction growth

The hive of construction activity perennially underway in the city-state of Singapore is remarkable given its small land mass.

An APAC Construction Survey published by industry body RICS showed transport infrastructure saw the biggest increase in workload in the third quarter of 2018, while water and utility projects, along with rail projects, were expected to see strong growth in 2019.

Construction demand in Singapore rebounded to S\$30.5 billion (\$23 billion) in 2018 after posting three straight years of declines, Building and Construction Authority data showed.

“The pickup was underpinned by more residential and industrial building projects on the back of strong en bloc sales in 2017 and the first half of 2018, as well as the continued positive growth in the manufacturing sector,” said Teo Jing Siong, group director of the Building and Construction Authority’s strategic planning office.

En bloc refers to the sale of multiple properties to a single buyer, typically all units in an aging apartment complex to a single developer.

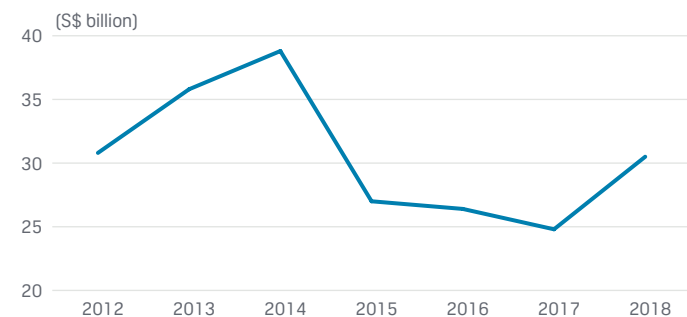
“Construction demand declined for three consecutive years from 2015 to 2017,” said Minister of State for National Development and Manpower Zaqy Mohamad.

The minister said a decision by the Singapore government to bring forward S\$1.4 billion in public projects to start between 2017 and early 2019 has helped companies ride out a domestic downturn.

Public projects accounted for S\$18.4 billion of 2018 demand, or about 60.3% of the total S\$30.5 billion. Private sector construction demand increased to S\$12.1 billion in the year. “The pickup was underpinned by more residential and industrial building projects,” Teo said.

The rebound in 2018 occurred despite market uncertainty caused by governmental cooling measures in the private

SINGAPORE CONSTRUCTION DEMAND REBOUNDS IN 2018



Source: Building and Construction Authority



Singapore construction tipped to speed up this year. Source: S&P Global Platts

property market, along with the postponement of the Kuala Lumpur-Singapore high-speed rail project, or HSR.

The 350-km HSR was due to begin construction in 2018 but has been delayed until end May 2020. It is expected to cost about Ringgit 110 billion (\$26.7 billion) to build.

As for key construction materials, total net imports and domestic production of rebar fell 3% year on year to 1.45 million mt in 2018, BCA data showed. Almost half the imports were sourced from China at 42%, followed by Qatar at 24%, Turkey 23% and Ukraine 5%.

Due to higher Chinese prices for rebar “arising from strong domestic demand and falling stocks amid production capacity cuts for environmental protection, the average market price for rebar rose from S\$789.50/mt in January 2018 to \$801.50/mt in August,” the BCA said.

As a result, “local suppliers imported more rebar from other sources in the second half of 2018,” it added.

But rebar prices fell towards the end of 2018, which the BCA “partly attributed to the ample global steel supply arising from a relaxation of winter production restrictions in China.”

A “moderate increase in construction materials prices is expected this year,” said Khoo Sze Boon, executive director at global design and consultancy firm Arcadis Singapore. BCA’s Teo described Singapore as “very much a price taker” in overall commodity markets, including rebar. “Any major company cannot fix the price higher than the world market price,” he said.

Singapore is expected to consume 1.5 million-1.7 million mt of rebar in 2019 on the back of the anticipated pick-up in construction.

The industry view with Will Myles from RICS



Will Myles

Regional Managing Director -
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Are there universal issues faced by construction companies across Asia-Pacific?

Traditionally, construction tends to be a local industry; it's largely domestic players, tapping into local labor, materials and technology where available, otherwise importing them. There are increasingly international players with access to international finance, particularly on "big ticket"

infrastructure projects and "grade A" buildings. The industry feels the ripple effect of global market forces but tends to oscillate mostly to local dynamics.

The "buyers" of construction projects are often government agencies (for infrastructure) and local developers (for real estate), for whom expertise may vary. Lowest cost procurement is often preferred, incentivizing "just-over-the-hurdle" quality output, and often leading to an adversarial approach to delivery. Barriers to entry are relatively low for construction groups, which make for intense competition, and the industry consequently suffers chronically low margins. Global productivity growth has stagnated across much of the sector in recent decades, though players with economies of scale have the best chance to achieve better margins.

More collaborative delivery methods have been tried – with mixed success – and industry value-chain fragmentation often disincentivizes project life-cycle thinking.

The industry has long lead-in times – from "yes, let's make the investment", through to land acquisition, planning, design and procurement; it can take years just to reach the construction phase. Lack of land access and unforeseen underground risks can cause significant delays. Government permits and licensing follow local regulations and are like cottage industries in some geographies.

There's a key difference between the needs of developing and developed nations. In Vietnam, for example, expected infrastructure needs are almost 100% "new projects", whereas in South Korea it's over 50% "repair and maintenance".

What's the industry feedback on costs at the moment?

What we've seen is that demand remains fairly strong but there are expectations of materials price inflation over the next 12 months and that's expected to deteriorate margins

over the region. In our APAC Construction Survey for Q3 2018, financial constraints were identified by a significant portion of respondents in Australia, India and Malaysia – and also in China, where the rising cost of materials and strong competition were denting margins.

Across APAC, there was a fairly universal need for more skilled labor. In some of the more developed markets like Australia, New Zealand, Singapore and Hong Kong, there was a shortage of workers with specific expertise and in developing countries there was a general shortage of skilled workers.

Are you seeing much in the way of innovation and technological changes in the industry across the region?

Construction is a conservative industry for good reason – if things fall down, people get hurt. Low industry margins limit the potential to recycle retained profits into R+D, and cookie-cutter project procurement processes make it difficult to offer new and innovative solutions.

Globally, one of the factors holding back innovation is the lack of consistency in standards. It's notoriously difficult to benchmark between projects and geographies: land, construction and property measurement standards have historically differed by country, and often by city. This generates a lack of transparency; the "buyer" has no easy benchmark for construction costs. For example, should a railway of 1,000 kms cost \$ 3 billion not \$10 billion? When estimates are available, what was included in the scope of capital investment in any case?

To address this, RICS and 40 other international professional bodies have come together to create International Construction Measurement Standards. These are intended as a way of doing 'apple for apple' comparisons between projects, an important enabler for benchmarking across the construction industry – something that has not been possible in the past.

We are also working with 30 other professional bodies to create the International Land Measurement Standards, which are intended to provide greater certainty and transparency over land rights, and helping to overcome hurdles when negotiating large-scale infrastructure projects, such as utility or transport networks.

Do these standards extend to the materials that are used in construction projects, steel for example?

The standards apply to professional services, and how professionals in the industry would measure and value assets rather than the product standards themselves. Clearly, the standards ensure transparent reporting to enable proper comparisons between assets of similar construction, for example between two single-storey buildings of brick construction, or between two roads of concrete construction.

To have a consistent way of comparing projects, the standard needs to take into account the materials that go into the benchmarks.

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