As we enter 2016, two interrelated macroeconomic factors will shape Europe’s chemical industry: the rate at which China’s economy slows down and the length of time crude oil prices stay relatively low compared to the past 10 years.

The slump in crude since late 2014 has sparked a boom for Europe’s petrochemical chain, eroding the competitive advantage that suppliers in the Middle East and the US have enjoyed from their cheap feedstocks. Record margins for polymers and ethylene were seen in 2015 and while it may be hard to achieve those kinds of returns again, there are still positive signs. Analysts are divided whether oil is heading down to $20/b or up to $65/b; either way it’s an improvement on the last five years for producers of plastics who were resigned to an era of three-figure oil prices. And with overall outages in 2016 expected to exceed those in 2015, European supply will be tight, but perhaps not so acute at times.

Looking at China, things are more mixed for European producers. The rate at which their economy slows will help determine whether Middle Eastern chemicals will be diverted from supplying Asia to supplying Europe. A doubling of feedstock prices in the Middle East will do nothing to shift the region’s gas crackers from their entrenched position to the left of the global cost curve, meaning they will continue to run at high rates for economic, if not for political, reasons and that could see imports to Europe rise. This is particularly acute as the world’s biggest petrochemical plant – Sadara in the Middle East – fires up, which may add further pressure by pumping out millions of tonnes of commodity grade chemicals.

These factors will shape prices alongside the health of Europe’s economy. As China’s manufacturing PMI lingered at a three month low of 48.2 in December, Europe’s is above 50 indicating growth in the latter and contraction in the former.

This report highlights the key themes that will shape the European petrochemical industry over the coming months, including the expectation of more outages at crackers and polymer plants curbing supply, higher benzene demand and lower supply, and strong demand indicators for gasoline blending components. However, the market will continue to be characterised by weak demand for butadiene and oversupply in methanol markets.

**OVERCAPACITY, LOW CRUDE SET TO WEIGH ON EUROPEAN METHANOL SUPPLIERS**

Additional capacity and the prospects of sub-$40 or even sub-$30/b oil prices are expected to weigh heavily on European methanol prices through the first half of 2016, as the spot market grapples with oversupply in the wake of reduced Chinese demand, according to trade sources.

Such weakness has already manifested itself at the end of 2015.

The European spot price plunged to Eur202.50/mt (around $220/mt) FOB Rotterdam on December 18, just after the Q1 2016 contract price was initially settled at Eur265/mt. That settlement was down Eur25 from the Q4 2015 CP and followed Methanex’s posted Q1 CP settlement at Eur275/mt, down Eur20/mt.

As a result, spot prices suggest a 23.8% discount to the initially settled CP level and a 26.5% discount to the price posted by Methanex.

Confounding expectations, these were far larger discounts than the 15% agreed for 2015 term contracts, and it indicated that buyers had the upper hand and from a larger supply glut to choose from.

Spot prices have fallen 13% since the start of December. Measured against the Q4 2015 contract of Eur295/mt FOB Rdam, the average discount of spot price versus the Q4 contract amounted to 21.6%, with the average spot price over the fourth quarter assessed at Eur231.34/mt as of December 18, according to Platts data.

One industry source said that at the start of October, spot discounts to the contract – which reflect a typical net contract price – were seen at these levels but then narrowed, only to widen again on the weight of oversupply and reduced demand. “This has caused people to become more unsettled and to accept other levels,” the industry source said in December.

A second consumer source said that if a supplier had resisted such high discounts and had not agreed any contracts by then, they could be stuck with unsold or untermed product.

Consumers had such a high number of suppliers to choose from now – including those from South America and the Middle East – laden with product, that a number of suppliers would have little choice to but to accept higher term 2016 discounts.

**Ultra-low oil undermines MTO production**

High crude oil prices and, as a result, the emergence of alternative olefin supply in the form of new methanol-to-olefin (MTO) plants, were seen as drivers of methanol demand growth.

This has now been thrown into doubt, however, as oil prices have halved since the $70-110/b levels that triggered MTO projects in China and in the US.

A low oil price makes it uneconomic to produce olefins using methanol as a feedstock – prices at $40-50/b make it borderline to operate MTO plants at full capacity, according to market sources.

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**METHANOL T2 FOB ROTTERDAM (Eur/mt)**

Source: Platts
As one trader said during Q3 last year: “If [Brent] drops below $40/b then there is going to be major correction for MTO [derivatives pricing]. The point is that MTO was supposed to be a cheaper way of [producing olefins] but with oil falling is it worth it?”

Earlier in the year, market sources said that around 4 million mt of methanol-to-olefins capacity would start up by the beginning of 2016. MTO units require roughly 3 mt of methanol to produce 1 mt of olefins.

According to Platts data in Q2, a total of 10 MTO projects by Sinopec Engineering Group, Wison and KBR in China were set to be launched in 2015 and 2016.

Demand for methanol from Chinese MTO plants were expected to be as high as 45 million mt/year by 2020, a jump of 64%, forecasts by Tecnon Orbirem in 2015 showed. However, by the end of the year, production rates of current MTO units in China were reduced, prompted by economic downturn in China, while new MTO capacity that was due to start production in the fourth quarter has been postponed or delayed.

“The new ones, the couple that were due to come on at the end of the year, have been pushed back to the new year but now even further ahead. Even if they starts they will be running at reduced rates,” the industry source said.

Sources pointed to propylene values in Asia, which were assessed at below $700/mt CFR China in October, as too low to support any additional re-supply from Middle Eastern suppliers.

“You need three molecules of methanol to make one molecule of propylene, so it is nonsensical to run an MTO plant [at these prices], at least in my world!” the methanol consumer source said.

New capacity supply overspill hits Europe
The price slump that looks set to continue in 2016 has coincided with a rise in US imports in 2015 and a fall in global demand as China, the most important consuming nation, was impacted by an economic downturn.

The new global capacities have added to the supply glut, with Methanex’s 1 million mt/year Geismar 1 plant having started production in 2015.

Some US product has already been imported into Europe, while product from South America and the Caribbean, normally destined for the US but displaced by the new US capacities, has to find a home. If China is not able to take it, the other home has to found in Europe, market sources say.

Other plants in the US have also started up in 2015, most notably OCI Partners’ expansion of the Beaumont plant in Texas to 912,500 mt/year, while the 1.3 million mt/year Celanese/Mitsui plant in Clear Lake, Texas, came online in October.

“US production levels have [almost] doubled to 6 million. We were at around 3.5 million mt capacity at the start of 2015. That methanol has to go somewhere. The original plan was for China as the powerhouse to take it [which hasn’t happened] so a lot of it is [now] coming to Europe,” the industry source said in December.

In addition, Methanex announced it was restarting its 1.3 million mt/year Damietta methanol plant in Egypt. The plant was idled due to natural gas supply issues.

Although the restart was due “in the coming days,” CEO John Floren said during a conference call on the company’s third-quarter results in October that the operating rates would be difficult to project.

The Damietta facility may see periodic shutdowns until the reliability of gas supply is restored. The facility did not operate in Q3 and produced only 8,000 mt in Q2 and 16,000 mt in Q1 due to the gas supply issues, according to market sources.

The weak Asian olefins prices seen in the fourth quarter have forced methanol feedstock suppliers into the Chinese methanol-to-olefins market to divert some of this product to Europe, weighing on overall Northwest European supply, European market sources said.

In addition to the methanol already backed up into the Rotterdam hub, volumes that could not be sold into the Chinese market were making their way into Europe via Turkey, adding to the market length, a second consumer source said in October.

“There is the question is, where is this material coming from? Is it coming from China, due to the [lower] MTO production rates and being diverted to Europe?” the source said.

What market sources agree on is that this oversupply has to go somewhere and, by all accounts, it has been and will continue to come to Europe. — Miguel Cambeiro, miguel.cambeiro@platts.com

WILL ADDITIONAL NON-EUROPEAN SUPPLY OUTWEIGH CRACKER OUTAGES?
The European propylene market has been characterized by supply length in recent months, length that has yet to show signs of easing. Europe has seen propylene production increase on strengthening margins, a result of falls upstream. European propylene supply has also been driven by an increase in imports. Fundamentals have weakened as demand for propylene within Europe was unable to match the increase in supply. As we enter 2016, a wave of new capacity coming online threatens to keep the pressure on propylene prices.

Feedstock falls, imports drive oversupply
Since the beginning of June 2014, a collapse in crude oil prices has brought down the cost of primary feedstock naphtha for European olefin producers. Integrated margins of inland naphtha crackers rose 40% to Eur1,034/mt (around $1,170/
PROPYLENE EUROPE/ASIA SPREAD /ParenleftEur/mt)

The US particularly was suffering from falling prices on oversupply of propylene, fueled by growing supply of refinery grade propylene had been seen with US refineries running at high run rates on chunky gasoline margins.

With prices increasing in Europe and falling elsewhere, arbitrage opportunities became apparent, with Europe sucking in 31% more propylene in the first nine months of 2015 compared with the same period a year earlier. A large portion of those imports came from the US and Russia, with the weakening of the ruble a significant factor on the latter.

In addition, large shipments that totaled between 14,000 mt and 17,000 mt left Ruwais in the UAE for Europe from an ADNOC-owned refinery. Together the US, Russia and the UAE fixed over 40,000 mt of propylene for Europe in August alone, which hit European shores in September and caused the steep fall in European spot prices we saw that month. September began with propylene spot prices at Eur771/mt and finished with them at Eur604/mt FD NEW, a 25% drop in just 21 trading days.

Arbitrage key
As 2016 begins, things are different. European propylene prices are now much more in line with those globally, and arbitrages to global trade flows. European pricing of propylene over the last few years has generally not been too far ahead of that in Asia, preventing imports from the East. However, on a shift in Asia’s propylene balance in 2015, from deficit to surplus, things look as though they are changing. Prices in Asia peaked last year in March, with polymer grade propylene reaching $1,040/mt FOB Korea. These have since fallen, however, hitting $490/mt in October, a low not seen since late 2008. They have yet to regain significant strength, hovering in the $500s in December.

“[Globally,] we do not expect any of this pressure on propylene prices to dissipate over the medium term, as there is significant new capacity planned over the next three to four years,” HSBC said in its end of 2015 Global Chemicals: Surviving the hangover report.

Across 2016 Asia looks to be the biggest driver of change to global trade flows. European pricing of propylene over the last few years has generally not been too far ahead of that in Asia, preventing imports from the East. However, on a shift in Asia’s propylene balance in 2015, from deficit to surplus, things look as though they are changing. Prices in Asia peaked last year in March, with polymer grade propylene reaching $1,040/mt FOB Korea. These have since fallen, however, hitting $490/mt in October, a low not seen since late 2008. They have yet to regain significant strength, hovering in the $500s in December.

“In Asia, overcapacity in 2016 is highly likely due to many capacity additions (PDH, FCC, MTO/CTO, crackers, metathesis) in China, Korea, India and lower derivative capacities (except some PP in China and India),” Amanpour said.

China has been the most influential in Asia’s growing supply, becoming increasingly self-sufficient through the expansion of propylene production. In Q4 2015 imports looked as though they had been altogether eliminated, in comparison to around 750,000 mt imported the previous year. In 2015, around

Altogether some 2 million mt/year of new capacity started up last year. In China, Oriental Energy started up its 600,000 mt/year PDH unit at Zhangjiagang, while Yantai Wanhua Chemicals started a 750,000 mt/year PDH plant in Shandong. In South Korea, Hysoung Corp. started up a 300,000 mt/year PDH plant in Ulsan, while the YNCC started its olefins conversion unit in Yeosu that can produce 140,000 mt/year of propylene.

Japan’s Ministry of Economy, Trade and Industry in its latest forecast sees the Asian surplus increasing to 331,000 mt in 2016, 596,000 mt in 2017 and 901,000 mt in 2018. Also in China many new CTO/MTO plants are expected, producing another 1.3 million mt/year of propylene — these will be linked to PP plants producing an equal amount of the polyolefin. However, how many of these come online with crude oil at sub-$40/b remains to be seen.
Cracker outages

What may lessen the impact of imports in 2016 is maintenance. Five large European crackers are expected to perform lengthy maintenance in 2016, which together make up around 13% of European production capacity. However, these will not overlap entirely and as a result the impact on supply is not expected to be great. 2015 saw 10% of European capacity out in August and September and this did little to curb length then.

Versalis’ Porto Maghera cracker, at 490,000 mt/year ethylene capacity, is also expected to provide a buffer on European supply through next year’s maintenance period. Versalis had restarted this previously shutdown cracker in February of 2015. It was restarted to supply Shell after its first lengthy outage at Moerdijk and was due to close when Moerdijk was back on its feet. But it is thought Versalis may extend operations through 2016 and even 2017, according to sources. — Amar Carmody, amar.carmody@platts.com

GAS FEEDSTOCKS TO GIVE ADVANTAGE TO EUROPEAN CRACKERS

The trend of increased gas cracking for European crackers is expected to continue into 2016, amid bearish fundamentals for NGLs which remain in abundant supply in the US.

Most European producers have diversified into gas cracking over the past two years. Some like Ineos are pioneering the move to US-origin ethane, while some like Dow Chemicals have preferred US LPG.

In 2014, naphtha and condensates provided about 68% of the feed to European ethylene crackers, while 21% came from ethane, propane and butane (the balance was from gasoil and other sources)—up from 18% in 2012, according to Appe Petrochemistry data. And 2015 figures were expected to show that trend continuing. For 2016, flexibility remains key with analysts forecasting abundant supply of propane, which means ethylene yields from Europe will remain higher than in previous years.

The LPG advantage

Much of the headlines over the past 12 months have revolved around the drive by many producers, such as Borealis, Ineos and Sabic, to source cheap ethane for crackers in Europe. But a big impact has also been felt from increased LPG.

At the forefront of the drive to take advantage of consistent LPG discounts versus naphtha, Dow – Europe’s largest olefins producer – said it had increased its potential propane throughput at its Terneuzen, in the Netherlands, and Tarragona, Spain, units up to around 60% of total feedstock needs. Together they account for 10% of Western Europe’s ethylene capacity and cracking propane has been so lucrative that Dow’s CEO Andrew Liveris described it earlier this year as a “tailwind” for profitability.

LyondellBasell too announced in Q3 that its European, Asian and International (excluding the Americas) ethylene production derived from “advantaged feedstock cracking” rose to 65% in the Q3, up from 55% a year earlier. The company’s four crackers together account for 8.3% of Western European capacity.

Even Ineos, which is set to be the first European producer ever to import US ethane for its crackers in Rafnes, Norway and Grangemouth, Scotland is eyeing increasing LPG volumes at its cracker at in Cologne, Germany, from 8-10% currently to 45% depending on supply and logistical constraints, an executive said in July.

With improved cost-efficiencies at US fossil fuel wells that keep molecules flowing and improved LPG export infrastructure, the global propane oversupply is expected to remain, causing price discounts to widen versus naphtha regardless of a sinking crude complex.

According to Hetain Mistry, managing analyst at Platts Petrochemicals Analytics: “LPG prices have been especially bearish which has incentivized cracker operators to maximize propane and butane use wherever possible. LPG prices on

LPG DISCOUNTS TO NAPHTHA INCENTIVISE PETCHM USE ($/mt)

Source: Platts

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a weight basis have generally been at a 20-30% discount to naphtha values throughout 2015, and we see this trend continuing, as the outlook for crude prices remains bearish, especially given year-end movements, and the NGLs market will continue to be dogged by oversupply, as the US continues to produce,” he said.

Other analysts have echoed similar views. In a report released in December, UK-headquartered bank HSBC said an oversupplied US propane market is likely to result in large export volumes, and is in line with the view that European producers are likely to do all they can to maximize their feedstock flexibility.

In the first nine months of 2015 the US exported 207.6 million barrels of LPG. This represents a 50% jump compared with the first nine months of 2014.

The ethane advantage
The feedstock flexibility doesn’t just stop at LPG. Ineos was due to receive its first trans-Atlantic shipment of US-fracked ethane at its Rafnes cracker in December, a spokesman said previously.

The Rafnes cracker has a capacity of 560,000 mt/year. This will be followed by another shipment at Ineos’ 1.06 million mt/year cracker in Grangemouth which is slated to arrive in 2017.

Ineos launched the first ships to bring US-fracked ethane to Europe in order to cut feedstock costs at the two steam crackers. But it will also supply ethane from Grangemouth to Shell Chemicals Europe and ExxonMobil Chemical for cracking at their Scottish Fife ethylene plant.

The companies did not disclose the volume or price of the deal, but it will start in 2017 and according to analysts, will transform Ineos into an ethane distributor.

So far, Ineos, Sabic and Borealis have committed to bring in US shale gas. But those deals were signed when naphtha was trading at a $700/mt premium over ethane. That premium has now sunk below $300/mt.

Future deals on US ethane are questionable. Versalis which announced last year that an US ethane deal was imminent, has not followed up on it yet. LyondellBasell recently ruled out US ethane for its European crackers.

LPG imports carry logistical benefits relative to ethane imports and also require less investments in naphtha crackers to change flexibility.

Naphtha’s share as a feedstock in Europe is expected to decline amid the US oversupply in NGLs. European producers are not complaining about it. Dow has said that its margins from LPGs have risen fivefold since 2010.

European spot cracker margins swelled to average at $563/mt this year, compared to last year’s average of $255/mt.

While the main factors were “unprecedented” outages in Europe amid a fall in euro against the dollar hampering imports, advantageous gas cracking was also seen as a contributor. — Nandita Lal, nandita.lal@platts.com; Daved Chohan, daved.chohan@platts.com; Iain Stevenson, iain.stevenson@platts.com

GASOLINE-BLENDING COMPONENTS POISED FOR BULLISH YEAR
Following a year of remarkable strength in the Northwest European market for gasoline and its blending components, the market is already showing signs that this bullish trend will continue in 2016. Increased gasoline export opportunities out of Europe and an expectation of lower imports of octanes to Europe are likely to shape a strong market for octave boosters in 2016.

As the seasonal high points for gasoline demand in Europe and the US are usually in the summer months, gasoline cracks for European refiners usually reach their low point toward the end of the year. Diesel cracks have historically outperformed gasoline cracks in December every year, but in 2015 it was different.

Gasoline cracks – measured as the Eurobob physical barge spot price against Dated Brent crude oil – strengthened throughout December and stood at $11/b in mid-December. Meanwhile, the crack for ultra-low-sulfur diesel stood at $6.50/b mid-December. Never before, since Platts launched its Eurobob barges assessment, have gasoline cracks outperformed diesel cracks in December.

Out of the “whole barrel,” European gasoline proved the star of the show throughout 2015. This was partly due to unusually strong gasoline demand on the back of lower outright prices, refinery outages in Europe and the US and, last but not least, high premiums for octave-boosting gasoline components.

MTBE’s factor to gasoline hit an all-time high in the summer, as a shortage of both MTBE and gasoline components in general pushed premiums upwards across the board. As a result, the front-month swap premium traders were willing to pay for prompt Eurobob gasoline barges in the Amsterdam-Rotterdam-Antwerp region hit an all-time high at $70/mt.

GASOLINE / DIESEL PROMPT CRACKS ($/mt)

Source: Platts
MTBE had suffered from a supply hangover since the first quarter of the year, when the usual stockbuilding for the summer season takes place. According to Eurostat data, around 485,000 mt of MTBE were exported from Europe to the US in the first quarter of the last year compared with 81,000 mt in the same period in 2014, as a large part of US Gulf Coast-based MTBE producers underwent a turnaround.

European producers also encountered feedstock issues throughout the summer, as steam cracker outages and unusually warm temperatures affected cracker operations, resulting in a shortage of raffinate-1 – an important feedstock to MTBE production.

The factor of raffinate-1 to naphtha CIF cargoes hit 1.27 in July this year, compared with 1.19 in July 2014. Some MTBE turnarounds are rumored to be scheduled in the US Gulf in Q1 2016, however not of the same magnitude as January 2015, which will possibly result in some product leaving Northwest Europe for the US.

On the other hand, MTBE imports to Europe are likely to contract in 2016, especially volumes from Russia and the Persian Gulf but large volumes especially from the latter production area have traditionally found a home in Europe. Local demand in Russia and the Middle East is expected to increase ever more this year, resulting in lower imports to Europe.

Lower outright prices have attracted more demand in those areas, but more importantly countries like Saudi Arabia and Russia are increasingly adapting stricter standards on gasoline specification, which increases demand for higher quality, oxygenate blending components such as MTBE. In the Middle East, temperatures are high throughout the year, resulting in an even consumption of blending components such as MTBE.

The strength of the gasoline market, coupled with subdued demand from chemical producers, caused aromatics such as toluene and mixed xylenes to price off the gasoline market in 2015, much to the frustration of contract buyers in the chemical sphere.

Many market participants expected toluene and MX to move away from gasoline-related pricing as winter arrived and seasonal demand for gasoline slowed down. But as European demand lost steam, high aromatic gasoline exports to China and an open arbitrage to the US took picked up, resulting in the gasoline-driven pricing of toluene and MX to continue. This trend is expected to continue in 2016, as the gasoline market is expected to remain strong next year.

Following Volkswagen’s emission scandal and increased worries among policymakers regarding the harmfulness of nitrogen oxides contained in diesel emissions, particularly in cities such as London and Paris, many
expect policies that would push European consumers increasingly towards gasoline consumption instead of diesel. Needless to say, this is likely to prove a bullish factor for European gasoline, which will in turn cascade into a blending components premium.

The lifting of the US crude export ban is also likely to prove bullish for European gasoline, as the cost advantage that US refiners have enjoyed on the gasoline cracks is likely to be eroded. The WTI and Brent crude oil benchmarks look likely to continue pricing near parity now, as opposed to the discount WTI has traded at for the past several years. This will make European gasoline barrels more competitive to export.

As crude oil and its products prices have more or less halved since 2014, governments in emerging economies have seized the opportunity and removed gasoline subsidies. The Nigerian government recently announced that subsidies on gasoline imports – the difference between the import cost and the price at the pump – by 12%.

European refiners and traders are traditionally large suppliers to the West African gasoline market, but it is not certain whether this will prove a bearish factor. Gasoline imports into West Africa were quite often troublesome due to delayed payments from the government to gasoline marketers in the area. It is possible that this will be less of a problem now. Lower subsidies are also more than offset by lower crude oil prices, so in the end it may all prove positive for European gasoline traders. — Thordur Gunnarsson, thordur.gunnarsson@platts.com

EU PVC IMPORTS (mt)

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Source: Eurostat

EUROPE’S CHLORVINYLs MARKETS SEE CLOSURES DRAW NEARER

In 2016, pressure is set to build on the European chlorvinyls chain, with potentially significant contraction among upstream chlorine manufacturers and the possibility of increasing length in the downstream polyvinyl chloride market, according to trade sources.

The chlorvinyls chain runs from upstream chlorine, which will see increasing costs as producers strive to meet new manufacturing requirements, through intermediates ethylene dichloride and vinyl chloride monomer, to downstream polyvinyl chloride.

New legislation means producers of chlorine and its coproduct caustic soda must convert mercury-based production to less polluting membrane-based production by the end of December 2017 or close.

With around a fifth of all chlorine production in the European Union, Norway and Switzerland using the antiquated mercury technology and around half of that set for conversion to membrane, there is likely to be significant contraction over the next two years.

“The combination of electrochemistry and the legislation change in the EU will lead to higher chlorine prices and this will push prices up further down the chain,” analyst Markus Mayer of bank group Helvea-Baader told Platts earlier last year.

Global production of PVC stands at around 50 million mt. And with just 12% of that in Europe, compared with 17% in North America 17% and 45% in China, it’s under threat.

Mexican wave

While rising costs will remain a concern for Europe’s PVC producers, lower margins also are on the horizon.

The purchase of German producer Vestolit in December 2014 by Mexico’s biggest PVC producer, Mexichem, for Eur219 million (around $238 million at current rates) could well bring with it additional imports across the Atlantic, pressuring prices further. Vestolit is to become the European distributor of PVC for Mexichem from January 1, two sources close to the matter said last September, and the Mexican company may send an extra 200,000 mt to Europe from this year, one of the sources said.

Mexichem is already the largest producer of PVC resins in Latin America with total installed capacity of 750,000 mt/year at its plants in Colombia and Mexico. Vestolit’s total installed capacity is 415,000 mt/year.

The EU imported 212,410 mt of PVC from Mexico in 2014, compared with 115,013 mt in 2013, Eurostat data showed. The 28-nation bloc imported 114,508 mt in the first nine months of 2015.

It all adds up to an oversupply of about 15-20%, according to HSBC’s global sector head for chemicals Geoff Haire. “There probably is an opportunity to close capacity,” he said.

Other competitors

The US shale gas evolution has generated an abundance of ethane and market players expect an increase in derivative ethylene output in the US.
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Some of this will end up as PVC and may be shipped to Europe, adding to length there. “As we approach of the end of the decade the European [PVC] industry needs to grasp the nettle, because if all this ethylene capacity builds up on the [US] Gulf Coast, one of the things they are going to be producing is a lot of PVC,” Haire told Platts in December.

“They are going to produce all this PVC and then they end up in a situation where there is nowhere for it to go,” he said.

It will not be North America, he said, and while some will go to China, there will still be surplus material. “The next place it will come is Europe,” Haire said.

The North American shale gas boom has reinvigorated petrochemical manufacturing in the US with cheap ethane availability, buffering the outlook for PVC feedstock ethylene capacity in the region.

In North America, shale gas-fueled ethylene production during the next decade is expected to climb to nearly 45.3 million mt in 2024 from 30 million mt in 2014 – a 51% increase, that threatens to disrupt traditional global trade flows of the main building block for most modern plastics, according to Platts estimates.

The boom is not limited to the Americas. Over the next 12 months the world’s largest petrochemicals complex – Dow and Saudi Aramco’s joint venture Sadara – will start to fire up. The $20 billion project in Jubail, Saudi Arabia, will start to pump out more than 3 million mt/year of petrochemicals.

Added to that is an additional 10 million mt/year of ethylene capacity in the Middle East over the next 10 years.

In Asia, coal-to-olefins technology will deliver ethylene to PVC producers. CTO and methanol-to-olefins technology is expected to satisfy more than 10% of Asian ethylene demand by 2024, up from a current 6%, according to Platts estimates. — Thomas Washington, thomas.washington@platts.com

Old plants are vulnerable to shutdowns, particularly if plants are run at near-capacity or attempts to control costs result in a decrease in preventative measures,” he added.

Hassan Ahmed, partner of Alembic, a New York-based research firm, forecasts that ethylene planned and unplanned outages as a percentage of total capacity in 2016 will increase to 9%, compared with 8.5% in 2015, already an “elevated level.”

The main cause for the recent uptick in unplanned outages is an ageing asset base globally, he told Platts in December.

2015’s unparalleled supply problems
Throughout 2015, a number of production outages slashed availability leading to a spike in downstream polymer prices.

By the end of summer, over 50 force majeures had been declared across all polymers. At one stage earlier this year there were 30 force majeures in place at the same time. Many polymers prices reached record highs in the summer: for instance, low density polyethylene contract prices touched a record high of Eur1,750/mt (around $1,910/mt at current rates) FD NWE – a premium of Eur645/mt over ethylene. A year earlier that premium was just Eur295/mt.

The unparalleled supply issues faced by converters in summer led to harsh criticisms of European polymer producers by plastic associations in Europe. The biggest packaging association, European Plastics Converters, or EuPC, said in April that the force majeures could lead to processing companies departing the EU to re-establish themselves in Asia where a more favorable polymer supply situation persists.

The four largest national organizations representing the plastics packaging industry in Europe, Elipso (France), IK (Germany), BPF and PAFA (UK) also released statements expressing their concerns.

IK Industrievereinigung said in April that many force majeures that had been declared contained little information, which made it difficult to “ascertain whether the criteria for force majeure had been met.” It said that the number of cases of force majeure had reached “epidemic proportions.”

LDPE PRICES HIT RECORD HIGH IN 2015 SUMMER (Eur/mt)

Source: Platts
All of the associations called for investment in polymer capacity in Europe.

**Europe handicapped by structural issues**
_structural issues, namely relatively expensive labor, energy and environmental costs, are seen to plague the European petrochemical industry and underpin the volatility in prices._

As a high cost-producing region, western Europe won’t see additional polyethylene capacity in the near future; Platts Petrochemical Analytics expects the region’s polyethylene to grow to around 2 million mt by 2025 from around 0.6 million mt currently.

And European polymer prices are expected to shrug off the decline in the crude prices amid shortages of polymers, said Ron Marsh, chairman of Polymers for Europe Alliance. The EuPC decided during its general assembly in May to initiate the Polymers of Europe Alliance to voice the concerns of European converters.

Having reached its record high in the summer, LDPE declined to a low of Eur1,460/mt FD NWE in October, before regaining some momentum in November-December. Prices were last assessed at Eur1,530/mt FD NWE.

“Currently, in spite of a bearish outlook for oil prices, the outlook for polymer prices [in Europe] is bullish,” Marsh said. “It is not all because of the force majeures in Europe. It is about not having sufficient raw materials. Even without the force majeures, we currently have a similar situation to summer again.”

The Middle East, Far East and the US will see capacity additions till the end of the decade, increasing polymers supply and thus exposing them to downside in prices. In stark contrast, Europe is not installing new capacity, and its ageing assets frequently break down, causing shortages in supply, so there is less risk to the downside for European prices. But the upside in European polymer prices, will be capped by the global prices. — _Nandita Lal, nandita.lal@platts.com; Daved Chohan, daved.chohan@platts.com_

**EUROPE PINS HOPES ON ASIAN SUMMER DEMAND FOR BUTADIENE**

The emergence of 310,000 mt/year of additional butadiene in Europe in the second half of 2015 exacerbated an existing glut on the market. Now a wide cross-section of trade sources – producers, traders and consumers – believe that exports, primarily to Asia, will be the only channel for sale of the additional product in 2016.

Butadiene spot activity in Europe was minimal for most of 2015. With there being little scope of exporting butadiene to the US, which is also well supplied, European olefins traders are keeping an eye on the prospects of exporting cargoes to Asia as steam crackers in the region enter turnarounds in their usual March-September period.

“Traders may want to be in a position to deliver a cargo within days of it being ordered to compete with their Asian and Iranian counterparts.”

An arbitrage to ship European butadiene to Asia is currently closed with CFR China prices hovering in the $750-800/mt range and FOB Rotterdam assessments hovering slightly below $550/mt. It takes $300-350/mt to ship a butadiene parcel to Asia from Europe. “We will need the butadiene price in Asia to be well higher than $850/mt CFR China to make a shipment,” one of the largest butadiene trader in Europe said.

In 2015, cracker turnaround schedule in Asia ran from March to July and the continent gobbled up cargoes from exporters globally during this period, trade data showed. According to Chinese customs, China imports less than 10,000 mt of butadiene every month. However, it imported 38,502 mt of butadiene in March, 28,925 mt in April and higher than 20,000 mt during both May and June. Similarly, South Korea imported nearly 30,000 mt of butadiene in both May and June against the usual import of less than 10,000 mt/month.

Several major companies in Asia have already announced their 2016 cracker maintenance schedules. In South Korea, Lotte is expected to shut its cracker at Yeosu in April for 30 days, YNCC another South Korean company, is expected to shut its cracker at Yeochon also for a month-long turnaround beginning March 15 and a third South Korean company SK Chemicals is expected to shut its cracker at Ulsan for a month-long maintenance beginning mid-September.
A number of turnarounds are also scheduled in Japan the next year: Idemitsu is expected to shut its Tokuyama-based cracker for a month-long turnaround in September; JX Nippon Oil and Energy is expected to shut its cracker at Kawasaki for a turnaround beginning July and lasting till September; Asahi Kasei will shut its cracker at Mizushima permanently by February; and Mitsubishi Chem will shut its cracker at Kashima for a month-long turnaround beginning early May.

This could lead to increased run rates in Europe. As extra capacity came online, run rates have been poor. “Most of the butadiene demand in Europe is currently being met through contracts and the market is well supplied,” a European trader of downstream styrene butadiene rubber said.

**Downstream remains bearish**

Other than sporadic demand for butadiene during summers, several other factors are expected to weigh in on butadiene prices during 2016.

Downstream synthetic rubber, which is a major consumer of butadiene produced globally, is bearish, while natural rubber, its co-product in tires is battling surplus supplies. Over the past two years, the natural rubber market has seen a glut with new plantations maturing in previously unimportant producers such as Philippines and Myanmar and this trend is expected to continue in 2016 putting pressure both on butadiene and synthetic rubber.

The situation has turned particularly dire in Thailand, the world’s largest rubber producer, where farmers have cut down trees during 2015 and held demonstrations asking for grants. On Tuesday, the Thai government approved a $139 million loan support to the country’s rubber farmers.

The price of RSS-3 grade natural rubber, the most traded grade globally, has fallen close to 10% over the past year and was last assessed at 1.25 cents/kg FOB Singapore in late December. The price of TSR-20, the other major grade, fell 21% over the last year and was last assessed at 1.18 cents/kg.

Similarly the price of synthetic butadiene rubber 1502 grade in Europe, the most traded grade, has fallen close to 20% over the past year and was last assessed at Eur1,028 ($1,125/mt) FD NWE. “Higher supplies of natural rubber are also keeping a cap on synthetic rubber values,” Mistry said. A bearish crude complex is also expected to weigh in on butadiene prices, he added.

SBR 1502 grade prices in Asia have fallen by over 30% the past one year and were last assessed at $1,065/mt CFR Northeast Asia. “SBR plants in Asia have been running at less than 60% of capacity and a major producer wants to shut down its plant for a short period considering long-term bearish demand sentiments,” One of the largest rubber traders in Europe said.

“A major South Korean SBR producer recently came to Europe to ink a long-term contract and direct some of his product here but went away after observing the well-supplied market.” — Shashank Shekhar, shashank.shekhar@platts.com

**EUROPEAN BENZENE MARKET TO GRAPPLE WITH LOWER SUPPLY, HIGHER DEMAND**

After a year plagued by supply length, the European benzene market is slightly bullish for 2016 as it grapples with lower domestic supply, as the region continues to see the switch to lighter feedstocks at NWE steam crackers in the form of LPGs.

As a result, this would leave demand fundamentals and exports into the region from the Middle East and Asia, which is seeing new capacities come online for the year, as the drivers for the direction of benzene for the year.

**Benzene supply to tighten**

With the growing concerns of increasing LPG cracking limiting the amount of benzene’s main feedstock – pyrolysis gasoline – in the coming years, this could tighten benzene supply fundamentals.

Combined with increased demand for gasoline components – such as pygas – in expectation of increased gasoline exports and less imported octane, 2016 could further constrain benzene conversion.

However, with Asia and the Middle East likely to see a further 1.17 million mt of new benzene capacity come on stream in 2016, the region is expected to remain a major of exporter of benzene with volumes expected to be shipped to the US and Europe, which could fill the increasing shortfall in supply from LPG cracking.

While the US is expected to remain the main destination for arbitrage volumes out of Asia, European buyers may seek to cover their prompt shortages from the Gulf Coast, and purchase regular long term supply from Asia, given the difference in shipping times between the regions.

According to Eurostat data, the region’s benzene imports during January-October grew 1.7% year-on-year to 667,070 mt, while exports grew 51% to 187,875 mt during the same time. In October alone, EU benzene exports rose 97% year-on-year to 16,410 mt, most of it being delivered to the US.

Much of these exports were attributed to the turnarounds at domestic styrene monomer and phenol production units which

**HEALTHY STYRENE MONOMER PREMIUM OVER BENZENE DURING 2015 ($/mt)**

Source: Platts
caused a demand slump for feedstock benzene during the second and third quarters this year.

As a result, this could reduce the level of exports being shipped out of the EU as market participants keep benzene for use domestically in light of the tighter feedstock situation and increased imports into the region on the capacity increases in the Middle East and Asia.

**Demand from derivative styrene to increase**

Following a year of slack demand for benzene from its derivatives, largely due to turnarounds downstream, 2016 is likely to see an uptick at the beginning of the year.

The largest demand uptick will come with the return from Elita BV’s POSM-2 unit at Moerdijk, in the Netherlands – a 50:50 joint venture with BASF, which has a nameplate styrene capacity of 550,000 mt/year and 250,000 mt/year propylene oxide capacity.

This unit is due to restart production in January, after an explosion in June 2014 and has been offline for the duration of 2015.

The return of this unit alone could increase domestic benzene demand by up to 37,620 mt/month, assuming the unit runs at full capacity, according to Platts calculations.

This should overshadow a decrease in demand expected from the cyclohexane market when Spain’s Cepsa reduces its production capacity at its 180,000 mt/year cyclohexane plant in Huelva by 27.7% to 130,000 mt/year in 2016.

**ASIAN EXPANSION IN PX AND PTA – A BLESSING OR A CURSE FOR EUROPEAN MARKETS?**

Asian expansion in paraxylene and purified terephthalic acid production looks set to drive European markets in 2016 – while imports of polyethylene terephthalate from Asia rest on the direction of the euro and EU protectionist measures.

Asia has been at the forefront of PX and PTA expansions in previous years and this trend will continue into 2016. Will this be a blessing or a curse for the European markets in 2016? The huge PTA expansions in Asia will support upstream PX demand globally – but the PX landscape in Asia and the Middle East is changing with rapid PX expansions strengthening export competition in Europe. And while Europe’s PTA expansions will support PX demand, the PTA market in Europe will be pressured by global overcapacity.

Further downstream in the PET market, the weak euro supported European producers as imports were limited from Asia, the largest source of imports for Europe. However, uncertainty over the direction of the euro and implications of protectionist measures will continue to cloud the PET market in 2016.

Changing supply dynamics outside of European borders will be key in understanding the PX-PTA-PET chain in Europe in 2016.

**Investment and opportunities**

Asia’s paraxylene expansions have totaled 9.6 million mt in the past two years, according to calculations by Platts Petrochemical Analytics and Editorial teams. China alone has been responsible for nearly half of these expansions, adding approximately 4.5 million mt.

South Korea added 3.3 million mt, while there were large scale projects in India and Singapore. Despite these large expansions, the Asia PX market has remained in a deficit, due to major PTA investments – these have added a total capacity of 18.5 million mt/year since 2014.
Asia’s growing PX consumption has led to export opportunities for the European market. The sole outlet for spot PX in Europe has been the export market, which has meant spot pricing in Europe has been driven by the consumption region with the most liquidity, most often Asia.

In 2015, there was a period in the early summer months when spot pricing was driven by the US. PX supply was tight in the US due to low run rates at toluene disproportionation (TDP) units.

Strong gasoline blending demand meant that PX extraction from mixed xylenes was limited, since MX availability was low as most MX went into the gasoline pool. This led to high volumes of European PX traveling across the Atlantic. The latest Eurostat data up to October show that PX exports to the US totaled 211,850 mt during January-October, nearly tripling in volume from 75,000 mt in the same period in 2014.

Outside of this period, PX has generally looked eastwards, as spare PX molecules looked for a home in Asia, as the region with the most demand in terms of liquidity and volume. Since October, spot pricing has been driven by Asia, as sources pegged the price at a netback to Asia.

The upcoming PX expansions in Asia and the Middle East in 2016 will mean, however, that Asia will look increasingly within its borders and towards the Middle East for its PX needs.

India’s Reliance is expected to begin its 2.2 million mt/year PX plant in India, while Petro Rabigh is expected to start its 1.3 million mt/year facility in Saudi Arabia. This will lead to stronger export competition for Europe. In 2016, European market players will be eyeing opportunities elsewhere in the world to export PX, as Asia and the Middle East become increasingly self-sufficient.

Expansions
But are there any factors which will support PX demand within European borders? A key source of demand is additional PTA capacity in Europe in 2016.

In Europe, Artlant’s 700,000 mt/year plant in Sines, Portugal, restarted in October 2015. The plant was idled in November temporarily. At the time of closure, the plant was expected to restart production by mid-December.

However, Artlant was reported to be looking for an investment partner or buyer for the business in mid-December. A source close to the company said that Artlant was hopeful of having news of a deal by the beginning of 2016.

However, it was unknown when the plant will restart production. The plant was expected to run at 70-80% utilization rate in 2016, which would have provided a boost to PX demand in Europe.

Another potential source of PX demand in 2016 is Indorama’s PTA expansion of 250,000 mt/year, adding to its current

350,000 mt/year facility in Rotterdam, in the Netherlands. Works are expected to be completed in Q2.

These sources of PX demand will be welcome when PTA production at these plants resumes or begins. However, this will coincide with further PTA expansions in Asia, totaling 6.2 million mt/year in 2016, according to calculations by Platts.

This will mean that Europe will see ample PTA supply in 2016, both within and outside the continent, which is likely to pressure utilization rates at PTA plants in Europe in 2016, as producers face import competition.

PET competition
PET is a market which has long faced import competition, mainly from Asia. The weak euro in 2015 helped keep foreign PET out and latest Eurostat data up to October show that import volumes fell 8% year-to-date to 760,526 mt.

The weakness of the single currency supported European PET producers who had operated their plants at approximately 70-80% rates this year, below full utilization rates. The PET market has also been supported by protectionist measures placed by the EU. One key measure is the anti-dumping duty on Chinese-origin PET.

Duty of up to Eur184/mt was payable on Chinese PET, but this was due to expire in November 18. However, PET producers requested a review of this, and the European Commission announced that it would retain the duties for at least another year while it carries out an investigation.

To conclude, the changing landscape in supply in Asia will be the key driving factor for the PX-PTA-PET chain in 2016. Growing PX capacity in Asia will strengthen export competition for Europe, while on PTA, it may lead to a global supply glut.

The direction of the euro will dictate the level of PET import competition European PET producers will face from Asia, while EU protectionist measures on PET will also underlie trade dynamics. — Yuriko Kato, yuriko.kato@platts.com
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