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The year 2017 is set to be one of two halves for many chemical commodities. A heavy turnaround season in Europe and Asia is expected to see a rise in many commodity grade chemical prices in the first half of the year, before a wave of additional cracker capacity comes online in the United States in the latter half of the year. That additional capacity is the gamechanger as it is expected to add up to 4% to the global cracker capacity; the reverberations of which will be felt on a global level.

A long-time in coming, this expansion as a result of fracking in the United States could finally start to arrive in 2017. And that will worry many European producers, who fear margins on producing polymers could come under pressure, ending what has been a boom period for Europe’s ageing cracker fleet. Startup delays or a fracturing of the new Opec/non-Opec oil cartel alliance may extend this prosperous time, but there is a general feeling that such dynamics only delays the inevitable fall in profitability at Europe’s liquid crackers.

And that will be welcome news for Europe’s converting industry, many of who have long eyed US supply of polymer pellets. Indeed, many have already restructured their contracts; buying resin from European suppliers based on a spot, rather than a contract index in anticipation of lower prices.

Like olefins and polymers, higher oil prices and a weak currency are expected to push up the price of aromatics, styrene, methanol and MTBE too. Styrene producers are anticipating a strong Q1 due to a heavy turnaround season in Asia, while methanol producers are also looking east; hoping profitability of China’s fleet of new methanol-to-olefin plants could trigger fresh demand and support global prices. On the flip side, benzene and paraxylene expansions east of Suez, could suppress prices in those two aromatics, but producers downstream will eye increased imports.

With regards to other aromatics, an anticipated shortage of octane on both sides of the Atlantic could improve demand for European toluene, mixed xylenes and MTBE, with traders of those products looking west.

As always, macroeconomic factors, such as a weak euro and higher oil prices, will drive short term price direction. But as it stands today they are set to send mixed signals, with the former protecting European producers’ market share from imports and the latter pushing up their feedstock costs relative to producers abroad.

Yet, perhaps the great unknown remains how the two political earthquakes of 2016 will impact the global economy through the reorganization of trading relationships. Most economists think the UK’s so-called Brexit referendum has yet to have a full impact on both the EU and the UK economies, while little is known about President-elect Donald Trump’s strategy for trade. While capital-intensive industries yearn for political certainty, as we enter 2017 it looks to be in short supply.

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**EUROPEAN BENZENE IMPORTS TO REMAIN RELATIVELY WEAK DESPITE ASIAN BUILD-OUT**

European imports of benzene are likely to stay relatively sluggish in 2017 as a weak euro, healthy European naphtha-benzene spreads and a heavy turnaround season for styrene in the US will likely mean Europe will remain the lowest-cost producing region, at least in the early stages of the year.

And while a build-out of benzene capacity in Asia and the Middle East would normally lead to higher European imports, robust demand in Asia is expected to pull in these molecules there instead. Historical benzene trade flows over the past few years have seen vessels move from Asia to the US and the US to the EU, with the latter remaining a net importer of benzene.

However, in 2016 this changed, with the closure of the arbitrage from the US to Europe and the simultaneous opening of the arb from the US to Asia for large parts of the second half of the year.

Looking at the 2016 fourth quarter average prices (as of December 19), Europe has consistently priced benzene at a significant discount to the US and Asia, with European product valued at $683/mt, compared with the US at $696/mt and Asia at $704.50/mt.

Despite this, benzene extraction economics in Europe also remained positive for producers in 2016.

And that is for a number of reasons, not least the fact Europe is naturally long in naphtha; a move to cracking lighter feed choked off domestic benzene production; and sluggish domestic derivative demand in the form of higher cumene imports meant that while prices were low, profitability remained relatively high.

The benzene spread to naphtha is a good measure of profitability of extraction rates and in Europe this was $278/mt as of December 19). Europe has consistently priced benzene at a significant discount to the US and Asia, with European product valued at $683/mt, compared with the US at $696/mt and Asia at $704.50/mt.

Looking forward, the largest deciding factor for the price of European benzene next year will be the glut of new capacity coming on stream in Asia and specifically the Middle East in the latter half of the year.

Around 2.1 million mt/year of new benzene capacity is currently scheduled to come on stream in both regions -- an increase of 5% to almost 20 million mt/year.

In January, Reliance Industries’ Jamnagar 500,000 mt/year will start up, while Vietnam’s Nghi Son refinery is expanding production by 240,000 mt/year in Q2 plus a further 220,000 mt/year capacity is planned in China later in the year, as well as around 340,000 mt/year of capacity expansion elsewhere in Asia, according to market sources.

However, the market is skeptical as to how much of that material will arrive in Europe as many of the start-up deadlines have so far slipped and there are infrastructure challenges to bringing...
material to Europe in volume.

Only a handful of benzene consumers in the Antwerp-Rotterdam-Amsterdam region are able to receive parcels of 5,000 mt or more, according to sources, creating challenges to the delivery of larger parcels.

The main pressure will, however, come from the Middle East, as phase 2 of the Petro Rabigh project is expected to complete at the end of the second quarter bringing a new 424,000 mt/year benzene plant on stream.

In addition, Saudi Aramco is also expected to start its 285,000 mt/year benzene unit in Ras Tanura by the end of 2017.

Yet Europe’s benzene producers are hopeful that molecules from that additional capacity will be swept up by rampant downstream demand, particularly by Asian styrene plants.

Market participants told S&P Global Platts that Chinese benzene demand is expected to increase 15-20% next year, which will cater for most of the demand as that equates to an increase of 1.5-2 million mt.

Around 2.84 million mt/year of new downstream benzene production capacity -- from phenol/acetone, caprolactam, styrene and MDI plants -- is planned to come online in Asia and the Middle East in 2017, with approximately 1.77 million mt/year based in China alone.

These plants are largely expected to come online in the second half of 2017, so there may be a lag between higher supply and higher demand.

Yet it all paints a positive picture for benzene producers and current styrene margins look set to support their profit margins, or at least for the foreseeable future.

Downstream run rates -- especially on the styrene side -- have been robust in Europe in the fourth quarter, primarily due to strong Chinese demand for styrene.

The European styrene-benzene spread averaged at $325/mt in the second half of 2016 -- well above the industry-estimated $200-$250/mt spread needed to break even.

The spread went as high at $580/mt in June, netting European styrene producers a handsome return.

As of mid-December 2016, the styrene arbitrage from Europe for February discharge in Asia remained open, meaning styrene producers will continue to suck up benzene and produce styrene for export.

Despite this, Europe remains an importer of benzene with net imports in the first 10 months of 2016 reaching 769,424 mt versus 476,777 mt in 2015, primarily due to a collapse in benzene exports from Europe in the first half of 2016 and an increase in term volumes from Saudi Arabia finding a home in Europe.

Over the longer term that is expected to increase. According to Platts Analytics data, benzene supply will outweigh demand in the EMEA region in the period 2017-20. The increase in supply will primarily come in the Middle East, but given the shorter journey from the Persian Gulf to Asia, some of those volumes are likely to be exported to Asia rather than Europe, as Middle Eastern suppliers do prefer that flexibility rather than locking all sales volume in term contracts.

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ASIAN MTO, CRUDE TO INSPIRE EUROPEAN METHANOL MARKET

The spectacular roller-coaster ride in the European methanol market, seen throughout 2016, might not be over just yet.

Most of the factors shaping the European methanol industry will remain this year out of control of the region’s producers, consumers and traders, making “uncertainty” the buzz word and hindering everyone’s ability to mitigate the volatility caused by the these factors.

The first quarter of the year is looking bullish ahead of the new methanol-to-olefins plants starting up in China. However, whether the upward trajectory will last will depend on the ability of crude oil producers to stick with announced production cuts, on whether Chinese demand for olefins will support run rates of methanol-to-olefins production and on whether European supplies will continue to be tight amid weakness in the euro.

Further down the curve, the second half might prove slightly weaker amid new methanol capacity coming onstream on the other side of the Atlantic and in Iran.

Eastern promise

There is a consensus that China will remain the key driver for the global methanol markets this year.

In particular, the first quarter will see the growth in demand for methanol amid the launch of two new methanol-to-olefins plants in China’s Changzhou province. China Jiangsu Sailboat will start its 830,000 mt/year MTO unit, followed by Fude Energy, with its 330,000 mt/year MTO unit. The two new units will consume around 3.4 million mt/year of methanol.

Pre-buying feedstock ahead of the launches, as well as replenishing inventories before the Chinese New Year have led to a surge — around 27% — in Chinese spot prices over the past two months.

European prices followed, with spot jumping 42% in the same period to Eur325/mt (about $340/mt) FOB Rotterdam on December 16.

The spike, however, eroded MTO margins, and many raised
a question of the sustainability and profitability of the MTO economics.

Based on the 3:1 ratio of methanol to ethylene and approximately $200/mt conversion costs, ethylene from MTO units should be loss-making at the moment.

Ethylene prices in Asia are hovering in mid-$1,100s/mt CFR North East Asia. Methanol spot prices are around $350/mt CFR China.

Even integrated units, converting ethylene into polymers could hardly be making any profit, with polyethylene prices seen in a $1,160-1,320/mt range CFR FE Asia, depending on the grade.

Crude impact
The landmark agreement between OPEC and a number of non-OPE countries to cut nearly 1.8 million b/d combined in oil production in the first half of 2017 pushed crude prices up by around 19% within a month and half to the highest levels since July 2015. This supported the rising trend in methanol. Should crude oil stay strong and even rise further in 2017, methanol is likely to follow the lead.

Higher oil is pushing prices of naphtha-derived olefins and polymers, and this makes methanol-derived alternatives potentially more competitive. This would result in higher run rates of MTO units and hence higher demand for methanol.

In addition, oil prices affect the overall energy complex, making such products as LPG, fuel oil and gasoline more expensive. These products compete with natural gas in such segments as power generation, heating and transport.

By becoming more expensive they can push prices of natural gas, which is a feedstock for methanol production, higher.

There is still a question mark over whether the oil producers will be able to implement the cuts and to what extent this could lift prices. Budget deficits could encourage them to overlook the self-imposed restrictions in order to balance their books, and a fear of losing market share to the more flexible shale producers could also affect their willingness to stick to the announced cuts.

Crude oil prices jumped to above $56/b in mid-December, though have proved volatile.

According to the Platt's Analytics Bentek's oil price forecast from December 23, Brent prices could rise above $58/b toward the end of 2017, averaging for the year at around $54/b.

Euro weakness
The fluctuations of the European currency could prove to be another important factor, and its impact is likely to be multifaceted.

The euro dipped below 1.04 versus US dollar in mid-December, its lowest level since the end of 2002.

Euro weakness has favored exporters of various chemicals throughout last year, and it could continue to be beneficial for some producers of methanol-derivatives. European producers of MTBE, acetic acid, formaldehyde and their own derivatives would retain their competitiveness on their home turf and grow their presence in the international markets. This could result in higher consumption levels.

On the other hand, a weak euro would likely continue discouraging imports of methanol into the region as producers, for example, in the Middle East would find Asian netbacks more appealing.

Europe imports around 600,000 mt of methanol on a monthly basis.

In extreme cases, Europe with its system of rigid quarterly contract price settlements could find itself bleeding out molecules, as was the case in the last quarter of 2016, when the open arbitrage saw reportedly 80,000 mt of methanol escape...
than other octane-boosters, such as xylenes and toluene.

For a year and a half in the wake of the sharp dip in crude oil prices in late 2014, xylenes and toluene were strong competition to MTBE as viable alternatives for gasoline blending amid dwindling demand from the chemical sector. However, it is expected that the primary interest in both aromatics will be from chemical users, such as TDI producers, rather than blenders, meaning alternatives will become more expensive.

Calculated as a cost of each additional octane point above standard Eurobob gasoline on a volumetric basis, MTBE is currently the cheapest octane, and less than half the second cheapest, toluene. This alone is unlikely to support demand for MTBE, however. MTBE has been the cheapest octane for some time, and yet it has been lacking the strength of previous years. MTBE’s factor to gasoline — a ratio that is the measure of the market’s strength — has been hovering in a 1.17-1.25 range in the past six months, far below the highs of 1.5 seen in 2015.

And this can be attributed to high inventories of finished grade gasoline which were carried over into summer from Q1 in 2016. Gasoline stocks in the Amsterdam-Rotterdam-Antwerp region stood at 980,000 mt in mid-December up more than 20% year on year according to latest Platts data.

However, the relative bullishness of the gasoline crack in December has led some traders to question whether the prompt strength will translate in 2017 to higher MTBE demand.

The anticipated tightness of global supplies has allowed European suppliers to negotiate lower contract rebates. Last year rebates averaged around 18%, and this year they are edging lower, with some saying that on average the will be around 15-17%.

Partial relief from Iran, the US
A partial offset of the bullish impact from weak euro, strong crude and new consumption in China is going to come from Iran and the US.

Iranian supplies into Europe have been growing steadily over the past two years, with increasingly more countries and companies in Europe willing to accept Iranian origin material. Iran’s Bushehr Petrochemical Company is expected to start up its new 650,000 mt/year plant by mid next year, which will increase the potential export volumes.

Iran has been looking to diversify its outlets, however if the Asian markets remain more attractive Iran’s offers in Europe would fade away.

Despite the ambitious methanol expansions plans in the US, only one new plant is slated to come onstream this year — Natgasoline’s 1.75 million mt/year plant in Beaumont, Texas. Smaller expansions will include Primus Green Energy’s 60,000 mt/year increase in capacity in Q4.

Following that, 2018 will bring up additional 1.76 million mt/year of capacity in the US.

Russia’s Shchekinoazot is also aiming to start a 450,000 mt/year plant south of Moscow by early 2018, but it is expected that the bulk of this production growth would be eaten by the country’s growing domestic demand.

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EUROPEAN MTBE TO FIND BALANCE BETWEEN COSTLIER FEEDS AND AMPLE SUPPLY

The European MTBE market will look for a new balance in 2017. Higher feedstock costs, tighter alternative octanes and limited resupply from the Middle East could support price rises for the premium gasoline blend component, while high inventories, anticipation of fresh supply from Russia and reduced exports to Latin America may balance that out. High feedstock costs are likely to erode margins of producers.

Producers will hope MTBE might regain its share in the gasoline-blending pool this year and that it will remain more affordable than other octane-boosters, such as xylenes and toluene.

For a year and half in the wake of the sharp dip in crude oil prices in late 2014, xylenes and toluene were strong competition to MTBE as viable alternatives for gasoline blending amid dwindling demand from the chemical sector.

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However, the relative bullishness of the gasoline crack in December has led some traders to question whether the prompt strength will translate in 2017 to higher MTBE demand.

Redirected Middle East supply
If the demand for MTBE grows, it will come at a time of reduced imports from the Middle East, as Asian countries continue to ramp up their consumption of cleaner-burning fuels, and

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Producers will hope MTBE might regain its share in the gasoline-blending pool this year and that it will remain more affordable
provide better netbacks to producers.

The rise in demand for MTBE from China, South Korea, Taiwan and Southeast Asian countries is expected to support Asian prices amid enhanced regulations on sulfur.

Middle Eastern producers of MTBE were favoring Asia over Europe throughout 2016, with a marked decline in the westbound exports.

The EU imported 111,646 mt of MTBE in the first 10 months of the year, down 40% year-on-year, according to the Eurostat data released in December.

Imports from Saudi Arabia halved to 49,467 mt, while Qatari MTBE – supplies totaled 21,634 mt last year — disappeared altogether.

In contrast to the year before, the best part of 2016 — the first half and throughout the fourth quarter — saw Asian MTBE market stronger than the European one.

On average Asia was trading at around a $37/mt premium to Europe in the fourth quarter and as high as $90.75/mt on December 15.

European MTBE was hovering around the low-$600s/mt FOB ARA at the end of December, while Asian MTBE climbed to over $720/mt FOB Singapore.

The difference in freight rates for MTBE from the Middle East to Asia and to Europe is typically around $10-20/mt. Shipping reports last showed freight from the Middle East to Asia in a $35-45/mt for 5,000 mt parcels, while 10,000 mt parcels to Northwest Europe could be fixed at around $45-55/mt.

There is an expectation that with the start-up of new MTBE capacities in China, the country’s need for imports will be tailing off this year. However, as the overall demand for gasoline in the country continues to rise the new domestic production — an 800,000 mt/year JV between Sinopec Jinling and US-based Huntsman in Nanjing — is expected to be easily absorbed.

### Russian supplies

Yet producers face a threat of imports far closer to home. Russian major Sibur is expected to begin exporting about 50,000-60,000 mt/year of MTBE, according to market sources. The company was previously a sporadic seller into spot markets but now plans to be more consistent as demand within Russia has plummeted under strenuous economic conditions.

Such a dynamic may pressure European MTBE producers margins.

Three years ago Russia moved to the Euro 4 fuel standard, which pushed domestic demand for MTBE higher. However Russian refineries continue to expand capacity of gasoline-blending components, including building reformers and alkylation units. Better availability of reformate and alkylate will lessen the need for MTBE.

With the expansion of MTBE production itself, MTBE supply is likely to outstrip demand and seek overseas outlets.

Last year Rosneft’s Kuybyshev refinery launched a new 40,000 mt/year MTBE unit as part of large-scale modernization. This followed a launch of a 128,000 mt/year MTBE unit at the end of 2015 in Angarsk. Omsk Kauchuk is planning to expand its MTBE capacity by 2018 by 30% to 350,000 mt/year.

In the first 10 months of 2016, Russia exported 159,410 mt of MTBE, up 78% on the year, according to Russia’s Federal Customs service. Of that 63%, or 100,318 mt went to the EU countries.

#### Export pull

Export demand, especially via tenders into Latin America, will be key to determining the direction of European MTBE this year.

Demand for gasoline in Venezuela, typically the largest destination for European MTBE, was hit by economic and political issues last year. Rising crude oil prices are likely to only partially help alleviate the country’s difficulties this year and the pull of European molecules is likely to stay limited.

### Russian supplies

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<tbody>
<tr>
<td>Total</td>
<td>159,410</td>
<td>89,379</td>
<td>84,672</td>
<td>224,383</td>
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<tr>
<td>EU</td>
<td>100,318</td>
<td>48,997</td>
<td>14,861</td>
<td>144,818</td>
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Source: Russia’s Federal Customs Service

#### RUSSIA’S MTBE EXPORTS TO EUROPEAN COUNTRIES

![Graph showing MTBE exports to European countries](source: Platts)
Mexican demand for MTBE, the third largest destination in 2015, was on a rise last year, but Europe failed to reap benefits, as it lost its share to the US. This could continue to be the case this year if the US remains heavy with material.

The reduction in exports to Latin America was well offset last year by an almost five-fold rise in supplies to the US Gulf, and exports to Bahamas and Algeria, resulting in a 4.5% year-on-year increase to 429,217 mt in total export volumes from the EU in January-October.

**Feeds to weigh on margins**
Irrespective of MTBE’s course in 2017, high feedstock costs are expected to dent the margins of producers. According to latest available data, average methanol prices in Europe during December rose almost 50% year on year, hovering around Eur321/mt FOB Rotterdam at the end of the month.

According to LyondellBasell’s Q3 earnings reports, European MTBE margins more than halved year on year to just 55.3 cents/gallon ($196.315/mt).

New methanol-to-olefins plants in China are expected to increase methanol consumption this year, pushing prices higher. Contract prices for the first quarter in Europe settled at Eur355/mt FOB Rotterdam, already factoring in this anticipated tightness.

It is likely — provided that MTO units continue to run despite not necessarily making profits in the short term — that the methanol market will remain strong throughout the first half of the year. Relief, if partial, is not expected to come until the second half of the year, when Natgasoline plans to start its brand-new 1.75 million mt/year methanol plant in Beaumont, Texas.

Iran’s Bushehr Petrochemical Company is expected to start up its new 650,000 mt/year plant also by mid-2017.

Butane, the other feedstock for MTBE also turned bullish as the year-end approached. The product gained 9.3% over the month and was last assessed at $411/mt CIF NWE.

As such, higher feedstocks costs are likely to eat into the MTBE producers’ margins in 2017.

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**SPECIAL REPORT: PETROCHEMICALS**

**EUROPEAN STYRENE MARKET — A YEAR OF TWO HALVES**

The European styrene market will see a tale of two halves in 2017 as continued tightness in the market in the first half of the year should maintain high prices, while a rise in production in the second half of the year will likely see prices ease. Downstream, elevated production margins in the polystyrene market will be depleted by new sources of imports amid a changing political landscape. However, the acrylonitrile butadiene styrene market is expected to enjoy better prospects due to a firmer outlook for demand than polystyrene.

**Turnarounds, arbitrage opportunities**
Asia, the largest consumer and importer of styrene, will see several units in China, South Korea and Japan going into turnaround in H1 2017 which will support prices. Sources say that the Asian styrene market is not prepared for the turnaround in H1 2017 which will support prices. Sources say that the Asian styrene market is not prepared for the turnaround season due to a backlog of delays in styrene deliveries in Q4 2016 as a result of a plethora of production disruptions globally.

European prices in Q4 2016 were unexpectedly strong as a combination of physical tightness in Asia and the US amid increased uncertainty following the explosion at BASF’s Ludwigshafen, Germany, site in October set a bullish scene. In another example, Westlake’s styrene monomer unit in the US experienced a fire in October which meant that Asia, which is net short styrene and typically relies on US for product, had to import styrene from Europe. Delays in Middle Eastern styrene supplies to Asia in Q4 amid firm Asian styrene demand contributed to mounting bullishness in the market.

The reduction in propylene oxide styrene monomer output at LyondellBasell and Covestro’s Maasvlakte facility in the Netherlands in late November was another unexpected event which prevented the global market to return to balance.

Styrene was expected to have been shipped from Europe to

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Asia in December in preparation for the turnaround season in Asia. As Asia pulled product from Europe and the US, this has led to elevated styrene prices in Q4 2016 and this is set to spill into Q1 2017. ‘[I am] not expecting January to alleviate [tightness in Europe in December],’ one market source said in December. While some say that Chinese styrene demand will ease during the Lunar New Year period from late January as downstream operations reduce production, others say that this period will simply be a period of rebalancing? for the global styrene market.

Equally, prices are expected to come off in the second half of this year due to fewer turnarounds in the largest market, Asia. In addition, new capacity is expected to come on stream in China which will ease the global market balance.

Although minor works are expected at styrene monomer units in Europe, the producers in question are expected to plan inventory levels beforehand meaning that the spot barge market is unlikely to be affected. No major turnarounds are expected in Europe in 2017, which means prices will largely be driven by supply availability in US and Asia.

**New sources of imports compete with European PS, ABS**

In the downstream polystyrene market, high margins enjoyed by sellers in 2016 are expected to be under pressure as a result of an increasing threat of imports. The largest supplier of polystyrene to Europe, South Korea, stepped up deliveries to the EU aided by the free trade agreement with the bloc. In the 10 months from January to October — according to the latest Eurostat figures — polystyrene imports increased 5.4% on the year to 28,732 mt. In addition, India has been an aggressive seller to the EU, nearly doubling deliveries to the economic bloc. Between January and October, imports of polystyrene reached 24,155 mt from 14,318 mt in 2015. Iran has also emerged as a new supplier of polystyrene to the EU. Although volumes remain dwarfed by countries such as South Korea and India, January-October supplies from Iran were registered at 13,674 mt, up from 2,573 mt. Likewise, Saudi Arabia has increased polystyrene deliveries from 3,078 mt to 11,346 mt.

While the EU’s relations with Iran remain fluid and the strengthening of the US dollar against the euro could shield some of the competition, there is no doubt that new players are advancing into the European market. In December, Indian and Iranian participants quoted competitive prices to European converters. With European polystyrene prices elevated due to high feedstock styrene prices, it remains a matter of time until more volumes flow into the EU, sources said.

On the demand side, the expandable polystyrene market may see some growth as a result of uptake in the construction sector, generally trending with growth in GDP. Outside of Europe, the EPS market in Turkey was reported to be growing strongly despite some slowing in uptake following the failed coup attempt in 2016. Russia may also see firmer demand as a significantly lower proportion of houses are insulated, according to sources. The outlook for general purpose polystyrene, however, is less optimistic, with sources saying that demand growth will be flat at best this year.

As a result, European seller margins are expected to fall from highs seen between Q4 2015 and Q1 2016. (see chart) Margins remain above the Eur150-200/mt (about $156-$208/mt) mark, the industry estimated break-even level, but will likely be depleted in 2017.

In the acrylonitrile butadiene styrene sector, import threat from the largest supplier of ABS outside of the EU South Korea will continue, but will not increase in 2017 as the majority of expansions have already taken place. In 2016, there was a 28% hike in South Korean imports into the EU between January and October.

Although there have been no ABS imported into the EU from Saudi Arabia in 2016, European sellers are wary that Petrokemya — a subsidiary of Sābic — may target the European market in 2017. Petrokemya was expected to have started up its new 140,000 mt/year ABS plant at Jubail, Saudi Arabia in June-July 2016.

In addition, Trinseo will start its new ABS unit in Zhangjiagang, China this year. The exact date is unknown, but the new unit is expected to cater primarily to domestic and other Asian customers. While China does not export to the EU, higher competition within Asia may push ABS out into the European market. Despite an underlying threat of imports, market sources have told Platts that ABS sellers producing specialty product are well-guarded from cheaper standard-grade imports.

ABS enjoyed stellar demand growth in 2016, thanks to a boost in local end use production — such as home appliance products and automotive. Uptake from the automotive sector was heard slowing at the end of the year and this trend is expected to continue in early 2017, but the weak euro exchange rate is expected to boost end-use exports and production, sources said.

To conclude, styrene monomer will see two differing market dynamics next year, driven by changes in supply — mainly turnarounds — in Asia. Polystyrene margins are expected to come off from 2016 highs, while firmer ABS demand will protect European sellers from emerging competitors in the Middle East and Asia.

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WEAK EURO, FEEDSTOCK EXPANSIONS PROMISE PROFITABLE YEAR FOR EUROPEAN PET PRODUCERS

A weak euro coupled with an increase in Asian paraxylene capacity, has given European polyethylene terephthalate producers cause for optimism in 2017, as they expect lower imports of resin and a chunky decrease in feedstock costs to support higher profit margins.

2016 was an unusual year for the PET industry, as the normal summer month boon for producers that is brought by higher demand for bottled drinks failed to emerge. Instead buyers ran down stocks in hope of a continued decline in crude.

The relative strength of PET compared to feedstock can be measured by PX prices over naphtha. According to S&P Global Platts data, the PX European contract price average spread over naphtha stood well above Eur400/mt (around $420/mt) in the first three quarters of 2016. This compared with Eur290/mt, Eur371/mt and Eur405/mt respectively in Q1, Q2 and Q3 of 2015, leaving buyers holding off in 2016.

However, that dynamic reversed in Q4, as demand was largely led by efforts from downstream consumers to replenish inventory levels to meet operational requirements.

Heading into 2017, PET producers are expecting a good year. A euro that fell 6% to $1.04 toward the end of the year from $1.11 during the summer had choked off imports to the EU in 2016, largely from Asia, and they hope this will continue. Monthly imports during September fell to 60,851 mt and stood at 64,481 mt in October, compared with the year high of 92,513 mt in February.

Simultaneously, there are no additions or expansions in PET production capacities planned in the near future in Europe, which means the competitive marketplace for producers will remain static. As a result, lower imports coupled with a stall in upcoming expansions will likely see European run rates increase year-on-year.

And all this takes place against the backdrop of what is likely to be lower production costs over the medium term for many European PET producers, as a significant build-out is expected to happen next year in production capacity of PX — a feedstock for purified terephthalic acid (PTA) and subsequently PET.

In the immediate term, however, PET producers face substantially higher feedstock PX costs, with the January Asian contract price firming $55/mt on the month. Nevertheless, European PET producers are likely to have little difficulty in passing the increases onto downstream buyers, as economics continue weighing on resin imports.

Build-out

India’s Reliance Industries recently commissioned its new 2.2 million mt/year plant at Jamnagar on December 29, 2016, having delayed from a previously scheduled start date of October. Of this, around 1 million mt/year of PX could be available for export as soon as March-April 2017.

Saudi Arabia is also entering the PX landscape with the startup of Petro Rabigh’s 1.34 million mt/year plant planned for Q2 2017.

In an effort to find a new home, sources said this PX could also make its way to Europe, hammering down feedstock costs for PET producers.

But it is not just PX expansions that will drive down production costs this year — PTA expansions will also have an impact. A number of Chinese PTA plants with a total nameplate capacity of 3.8 million mt/year are scheduled to restart in 2017, of which 2.3 million mt/year would be in the first quarter.

China’s Tonkung Group also has a planned start-up of its 2.2 million mt/year plant toward the end of 2017, while Taiwan’s Oriental Petrochemical also plans a net capacity addition of 1 million mt/year around Q2-Q3.

Such a change in fortunes for European PET production economics could breathe life into currently idled plants. Artlant’s 700,000 mt/year PTA plant in Portugal has been idle since November 2015 amid currently weak fundamentals, having previously restarted for just a month in October that year after remaining shut for around 16 months. However, as feedstock PX prices turn bearish amid production capacity increases, market participants said this could also potentially lead to a restart of Artlant’s plant in Sines.

“We could also see Artlant restart in this context, as PX from Middle East tries to find a home,” a source said. Alternatively, “if the Middle Eastern players do not know what to do with all the extra PX, they could invest in Artlant.”

Beyond 2017, Chinese PX production capacity is also set to skyrocket between 2018-20 by an additional 11.6 million mt/year.

With competition set to intensify in both PX and PTA, South Korean PTA producers, who have become Europe’s natural suppliers of PTA, could potentially take a profit hit as they lose feedstock cost advantages on both fronts, meaning European producers could be getting PX at close to production cost.

PET exports from the Far East to the EU could also suffer as economics take a toll on traded volumes. Some sources said it could be the case that South Korean producers might have
to reduce run rates at their PTA and PET plants in an effort to optimize costs and lessen potential over-production.

In summary, 2017 could go down in history as a year of significant changes in the PET supply chain. Within Europe, imports could continue losing ground on all fronts, with the exception of PX, and Europe’s PET market could also edge closer to supply self-sufficiency.

However, much will depend on foreign exchange rates, and geopolitical factors this year could see considerable currency volatility. Elections in both France and Germany and the ongoing Brexit discussions regarding the UK departing from the EU will all likely have an impact as the trading bloc seeks to boost what has been anemic economic growth.

Last year was a bumper year for European operators of steam crackers and that dynamic is expected to continue into the first half of 2017, as a heavy cracker turnaround season is expected to prop up cracker margins.

However, a reversal of fortune is set to occur in Q3 as long-awaited material from the US is expected to come to market and a slowdown in Chinese growth threatens once again to depress margins for European integrated petrochemical producers.

Last year was a remarkable year for petrochemical producers in Europe, continuing the trend started in 2015, after crude oil prices started plummeting in late 2014.

Spot cracker margins in Europe hit a record high of $911/mt in June 2015. They narrowed in 2016, to a year high of $758/mt (in August), though remained vastly ahead of the five-year average of $255/mt.

Crackers produce ethylene, the main building block of chemicals. Ethylene is used to make polyethylene, the most widely produced plastic resin in the world. As Europe is 67.5% dependent on naphtha as cracker input, the slide in crude prices leveled the ethylene playing field relative to advantaged US and Middle Eastern producers.

The solid margins, described as the "golden age for naphtha crackers," withstood the sharp increase in polyethylene imports into the region. High density, low density and linear low density PE imports were at 1.25 million mt, 556,548 mt and 898,392 mt respectively in the first 10 months of the year, all up about 25% versus the same period of 2015.

However, globally, PE production is forecast to grow from 84.7 million mt in 2015 to 121 million mt by 2026, according to Platts Analytics, with the majority of this expansion announced in North America, the Middle East and Asia. This means that Europe’s import dependency is set to keep increasing, with no further builds in Europe, implying that the bumper margins will face weakening. And this price dynamic could start to emerge next year.

H1 2017 will be characterized by a heavy maintenance season in Europe, expected to support margins in the continent. Eight cracker units are expected to undergo maintenance in 2017 and a further two have been heard to be scheduled. Europe has 44 crackers complexes with a combined ethylene capacity of 23 million mt/year.

US supplies to lengthen

Globally, ethylene cracker capacity from all forms of production is estimated to increase by 5.14% in 2017 to some 181.4 million mt according to Platts Analytics with the majority of these expansions announced in North America.

Four crackers are expected to start in Texas, USA this year. Occidental/Mexichem’s cracker in Ingleside with a capacity of 550,000 mt/year is expected to start up in H1, while ExxonMobil’s cracker in Baytown with a capacity of 1.5 million mt/year is expected to start up in H2, as are Chevron Phillips Chemical’s cracker in Baytown with a capacity of 1.5 million mt/year and Dow Chemical’s cracker in Freeport, also with a capacity of 1.5 million mt/year. All the crackers have corresponding PE capacities.

Some delays are expected. “To date no one has started their new cracker on time. Cost overruns are endemic in the industry,” Robert Bauman of US-based Polymer Consulting International told Platts at the K Fair in Dusseldorf in October.
The ethylene and PE capacities impact on Europe will be limited by export infrastructure. Ethylene exports are especially limited, as US so far only has one ethylene export terminal. Most of the exports are in the form of PE.

Platts Analytics managing analyst Hetain Mistry said in December that it was unlikely that major increases in US product would hit European shores initially, due to export infrastructure restrictions and lead times. “Also, it will take a while for new capacities to ramp up production which may limit product availability in the short term for long-haul transportation,” Mistry added.

European producers share this view. “The US still has to establish a supply chain, but probably in 2017, we won’t see a major invasion of material. [The] second quarter of 2017 is a high turnaround season [in Europe] which may see an import spike due to constrained material availability. In the first half of 2017, I don’t see a structural change in the flow of material,” one European producer said in December.

Asia’s ambitions for self-reliance
While the US ramps up production, Asia looks to become more self-sufficient in terms of ethylene and PE.

Asian ethylene capacity is estimated to reach 52.67 million mt/year in 2017, 2.15% up on 2016, according to Platts Analytics.

The variable to watch for will be Chinese growth. If China’s growth is robust, the excess global capacity will be easily absorbed, if not, Europe’s PE production rates might be hit by increased imports. Middle Eastern material traditionally sent to China could now find its way to Europe, putting further pressure on European based producers.

Chinese per capita polymer consumption is relatively low when compared to developed western markets, hence the Chinese market growth potential is extensive.

“China isn’t near where the rest of the world is in terms of kilos per capita of PE consumption. The US is around 30 kg per capita — China is still in the single digits but growing. Instead of importing 90% of [their] PE they may only import 50%,” Joe Pilaro, president of BRAE Partners Inc, said in December.

Currency volatility and trade flows
The other variable to variable that could impact global fundamentals will be currency fluctuations. With the US dollar and euro nearing parity, US export opportunities to Europe may begin to look less attractive to US-based producers who historically have struggled to compete with Middle Eastern producers for market share.

The euro has declined some 3.11% against the dollar since January 2016 according to Platts data. However, so far this has not dampened US exports of PE to Europe. The EU imported 2.92 million mt of PE in the first 10 months of the 2016 from the US, compared with 2.798 mil mt for the same period in 2015.

“It is difficult for US polyethylene [producers] to compete with Saudi Arabian [producers] as they have the cheapest costs by far. North America plans to export to Latin America and Southeast Asia. [They’ve] been valuable markets for them. Europe is a tough market for the US to compete in,” Pilaro added.

While it is not entirely clear how the European market will be affected by global capacity expansions many European market participants remain upbeat.

“I still believe European producers will drive the market and imports will be limited because of the lead times,” one trader said. This sentiment may well be correct, as exporting nations face both logistical and infrastructure challenges.

YEAR OF CHANGE FOR CHLOR-ALKALI IN EUROPE AS DEADLINE APPROACHES
Chlor-alkali capacity in Europe is set to further consolidate in 2017 as the deadline for the EU legislation banning mercury-based production takes effect in December 2017.

The consolidation will mean an increase in volatility in caustic soda prices and choke the rise in ethylene dichloride exports from Europe.

Chlorine and caustic soda together are normally referred to as chlor-alkali, which are produced together by combining salt and electricity.

Chlorine makes EDC, used to make polyvinyl chloride.

By the end of 2015, mercury technology represented about 20% of the chlorine production capacity in Europe. These units will have to either convert to a more modern method of production, such as membrane technology, or shut down. European chlorine production in 2015 was reported at 9.578 million mt.

“We have seen quite some consolidation, joint ventures, also some small shutdowns of capacity and we can only expect that this will continue. The timeline is getting very tight,” Dolf van Wijk, executive director of Euro Chlor, told S&P Global Platts in September. Meanwhile, global chlorvinyl producer Westlake expects that Europe could see losses of 800,000 mt of chlorine capacity by December this year.
Impact on chlorine and derivatives
PVC forms one-third of chlorine demand. The industry has already seen three major M&As over the past two years. In 2014, Westlake purchased Germany’s Vinnolit and Mexichem acquired Germany’s Vestolit. In 2015, the merger between Europe’s two largest PVC producers, Ineos ChlorVinyls and Solvay, created Inovyn, the consolidated venture more than twice the size of its next biggest competitor.

Most of the European PVC producers like Inovyn, Kem One, Spolana, BorsodChem and Ercos have integrated chlor-alkali units, where they use chlorine internally to produce EDC, while selling the caustic soda.

With contraction of chlorine capacity, the trend of increase in Europe’s EDC exports may halt. Currently Europe is a net EDC exporter. The EU exported 29,599 mt of EDC in the first nine months of 2016, up 9.7% on the year compared with the same period in 2015.

Dynamics in the European PVC market, meanwhile, will be set by economic growth, feedstock ethylene trends and global PVC pricing.

Asian PVC prices will likely remain stable and strong in the first half of this year, as ongoing inspections in carbide-based PVC plants in China limit output, resulting in excess supply in the region drying up. This means that Europe’s export arbitrage to Turkey may stay open, as Turkish prices closely track Asian PVC pricing.

A significant change in trade dynamics in 2016 for the PVC market was increased PVC imports into Europe from North America. Imports for the period of January to October 2016 were increased PVC imports into Europe from North America. This reduced the net export figure from 709,808 mt in January-October 2015 to 520,718 mt in the same period last year.

With new ethylene capacity coming online in US in 2017, US PVC might continue to be more competitively priced than Europe, extending the trend of increased North American imports into Europe.

Impact on caustic soda
Caustic soda prices ended last year at a high not seen since October 2013, at $410/mt FOB NWE. This was because of tightened availability amid chlor-alkali unit conversions and the upward trend has been continuous since January 2016.

At 214,794 mt, October 2016 caustic soda stocks were lower than in the previous month (September 2016: 222,121 mt), and also below the level of October 2015 (228,537 mt).

According to Eurochlor the chlor-alkali units that converted to membrane technology in 2016 include: Kem One in Lavera, France, Inovyn in Lillo, Belgium and CABB Group in Pratteln, Czech Republic.

The chlor-alkali units that are expected to be converted to membrane technology in 2017 include Inovyn in Zandvliet, Belgium, AkzoNobel/Evonik in Ibbenbüren, Germany, Evonik in Lulsdorf, Germany, BorsodChem in Kazincbarcika, Hungary, Hydrochem Italia in Pieve Vergonte, Italy and Inovyn in Stenungsund, Sweden.

Plants for which options are still being evaluated include SPC in Harbonnieres, France, El nosa in Pontevedra, Spain, Inovyn in Martorell, Spain.

Plants for which shutdown is certain are Inovyn in Runcorn, UK, Ercos in Vilaseca, Spain and Ercos in Flix, Spain and Spolana in Neratovice, Czech Republic.

Amid the uncertainty of the plants for which options are still being evaluated and expected shutdown on chlor-alkali plants (which won’t convert to membrane by December), 2017 is likely to be marked by volatility in prices for caustic soda.

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CHEMICAL DEMAND TO DRIVE TOLUENE PRICES IN EUROPE
Following nearly two years of pricing driven by gasoline-blending economics, chemical demand for toluene is expected to be the deciding factor in the toluene spot market in 2017.

The belated start-up of BASF’s 300,000 mt/year TDI plant in Ludwigshafen in Germany will play a large role in what is expected to be increased chemical demand. That, as well as a bearish outlook for gasoline demand and the possibility of lower demand from Asian buyers of mixed aromatics cargoes, means that chemical demand could determine value.
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Ever since the crude oil complex took a dramatic downward turn in October 2014, one of the biggest winners was gasoline sellers. Gasoline-blending margins and gasoline cracks were helped by a variety of factors.

A structurally long European naphtha market proved positive for gasoline-blending margins, and stronger than expected gasoline demand from the US into Europe caused gasoline cracks to surge and stay at elevated levels into mid-2016, but peaking in the first quarter of the year at $17/b.

Average gasoline cracks in Q1 stood at $10.35/b, compared with an average of $7.62/mt in the first quarter in the years of 2012-14. Not only has the gasoline crack risen in absolute value, but relative to the outright price of gasoline barges, gasoline cracks multiplied following the fall in crude oil prices.

Robust demand into Europe from Chinese buyers of reformates and mixed aromatics has also supported toluene prices, a consequence of the evolution of domestic specifications in China, which set requirements for octane and aromatics content.

This, in turn, meant Europe's long gasoline market was the cheapest source of octane boosters for Asian demand. China is Asia's demand center for reformate and mixed aromatics, importing about 400,000 mt/month in 2015.

Reformate and mixed aromatics, particularly pygas, toluene and xylenes, are octane-boosters used for gasoline blending, but come with a high aromatics content which restricts their usage in Europe due to a regulatory aromatics cap for gasoline.

But as of 2017, Beijing plans to clip the wings of independent “teapot” refiners by not awarding fuel export quotas to them, potentially reducing demand for premium octane into Europe. And this comes at a time when chemical demand is on the rise.

Chemical demand for toluene slumped in Europe in the fourth quarter, as two of the largest chemical buyers of toluene — Covestro and BASF — declared force majeures on toluene purchases.

Since then one of them — Covestro — has resumed TDI production at its plant in Dormagen, Germany.

BASF's new TDI plant at its chemical park in Ludwigshafen, Germany was originally supposed to start up in the second half of 2015. Following a series of delays, the company eventually flicked the switch on the 300,000 mt/year plant in the fall of 2016. However, following technical problems relating to the Ludwigshafen explosion in October, BASF was forced to shut down the plant again in early December. The company aims to start the plant up again in the first quarter of this year.

While TDI demand may pick up, conversion economics may remain poor.

On purpose toluene-to-benzene conversion is the largest downstream destination for European toluene, accounting for just over a third, or 35%.

As a rule of thumb, benzene needs to price at a premium of $150-$200/mt for the conversion to break even. Since the decline in crude oil prices in the fourth quarter of 2014 started to accelerate, the spread between the two products has been in negative territory, averaging at $430/mt in 2015 but improving somewhat in 2016 to $104.30/mt.

Most of European toluene-to-benzene conversion is integrated and runs regardless of profitability margins. Given that the outlook for the European benzene market is rather on the longer side and toluene demand is expected to be more robust from the chemical buying side, toluene conversion margins are likely to remain under pressure.

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TURKISH PE, PP MARKET TO SOFTEN ON MIDDLE EASTERN, US SURPLUS, FALLING ASIAN DEMAND

The Turkish polyethylene and polypropylene markets are expected to soften in 2017, on constant Middle Eastern supply, new US capacity in Q3, and an easing Asian PE market on weak macroeconomics and oversupply.

Turkish LDPE prices last year dropped to their lowest average since 2009, following the Middle Eastern build-out stemming from cheap production costs.

The average for 2016 is $1,223/mt CFR Turkey, up on the $1,173/mt average in 2009, but a far cry from 2014 when the average price of the year peaked at $1,646/mt. While the decline in crude oil prices may be held to account for this in part, 3 million mt of Middle Eastern PE and PP capacity coming on stream also had an impact.

Turkish imports of Middle Eastern product have clearly increased, and remain solid. Over January-October 2016, Turkey imported 52% of its PP and PE from the Middle East, at around 1.3 million mt, the latest data from Turkstat showed.

While the Middle East remains the main supplier, dynamics in the US and China will play an increasingly important role in 2017.

The global PE surplus is expected to peak in 2018, at around 4.2 million mt, according to Platts Analytics, and the driving force behind the excess over the next two years will be the extra tonnage coming on stream in China via the coal-to-olefins-to-plastics investments, and the start-up of some new shale-based ethane crackers in the US.

Falling Chinese demand to boost polymer availability
An easing Asian PE market on weak macroeconomics, and oversupply, combined with an increased drive towards self-sufficiency, could result in additional tons being offered into Turkey.
In 2017, Asia plans to boost capacity by around 3 million mt/year, and this will occur during a year of reduced scheduled maintenance — 0.5-1 million mt/year of PE in H1 2017 versus 1-1.5 million mt/year of offline capacity in H1 2016.

China’s polyethylene deficit will plummet 17% from 2016 to 2017, a fall to 8.9 million mt, from 10.7 million mt, according to Platts Analytics, driven by production expansions totaling 3.2 million mt, and increasing operating rates.

This will occur during a time of weakening demand in the downstream plastics sector. In 2017, China’s GDP growth is forecast to fall from 6.6% in 2016, to 6.2% according to the International Monetary Fund.

If China reduces its import appetite for polymers due to falling demand and increased local supply, this will boost availability of Middle Eastern tons, which will likely be offered into Turkey, among other markets.

US surplus to add bearishness but impact limited
Significant US polymer expansions are expected in 2017.

The US will add approximately 4.1 million mt of capacity in 2017, 87% of which is polyethylene, and this will add to a growing global PE surplus. “In the second half of next year we will start seeing the first phase of US shale-based ethane crackers come online and with that more PE tonnage available for export. The majority of PE will go to South America, however Asian and European markets will start seeing an influx of more US polymer,” according to Hetain Mistry, managing analyst at Platts Analytics.

However, the impact of these US polymer expansions on the Turkish market is less clear as Turkey constantly receives fresh offers given its location.

“Turkey is like a spot outlet for all suppliers. Any excess from Russia goes to Turkey; any excess in Uzbekistan goes to Turkey.”
This is the same with Iran. Even in Europe they can dump it into Turkey," one Turkish-based trader told Platts.

While the US volumes offered into Turkey may indeed be priced competitively versus Middle Eastern material, its location has become increasingly relevant as recent political and economic uncertainties add caution to importing tons from a market that is further away.

“Everyone is talking about new quantities from the States, but I don’t think it’ll affect the market much unless the Americans drop it $50/mt below Middle Eastern product. With this economy and the risk of the exchange rate following the collapse in the lira, transit time is more important now more than ever,” another Turkey-based trader said.

Borealis also said it does not expect the wave of ethane-based PE expansions in the US next year to apply pressure on European PE markets until 2018.

“We expect 2017 to be a good year [for Borealis] — there are no real indicators that will destroy [polyethylene] margins. New US supply is not expected to have an impact until 2018," Borealis CFO Mark Tonkens said in late November.

Middle East continues to drive bearishness
The Middle East, for PE alone, has a surplus above 12 million mt, and will continue to be the dominant polymer export force, with its main markets including Asia, Europe, and Africa.

The Middle East remains the largest exporter to Turkey, constituting 62% of Turkish imports in October, according to the latest data produced by Turkstat. Imports in the month totaled 112,938 mt.

Anecdotally, sources have recently said that Middle Eastern offers into Turkey fell toward the end of 2016. However, this is a consequence of recent surges in Chinese polyethylene prices, rather than any structural changes in trade flows.

A lack of buying appetite following the Turkish lira sliding more than 18% in the past year — currently around 3.52 to the US dollar — and higher netbacks in Asia have led to this, one Middle Eastern producer said.

Looking into 2017, however, the structural trade flows to Turkey aren’t expected to significantly vary, and the Middle East could grow its exports, centered around Iran.

Overall, Iran’s PE surplus is expected to increase from 2.9 million mt to 6.2 million mt from 2016 to 2025, more than doubling the Gulf state’s export might.

Some 83% of Iranian exports prior to the sanctions went to Asia, but Iranian petrochemical producers and traders now want to sell into Europe as they find the netbacks better and markets more open to fair competition, and as Iranian companies try to develop a logistics network in Europe, one source told Platts last month.

The cost competitiveness, proximity, and strong market share are all expected to advantage the Middle East amid a period of political and economic uncertainty in Turkey.

However, the increasing polyolefin surplus in the US needing to find a home, and falling demand in China over 2017, are both expected to add bearishness to Turkish PE and PP markets already at a two-month low.

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ASIAN EXPANSION TO INCREASE EUROPEAN PROPYLENE IMPORTS
A gradual rise in European propylene and polypropylene imports seen in 2016 is expected to continue in 2017, as fresh Asian capacity comes online and new European projects fail to materialize.

Before 2016, European propylene fundamentals had typically been balanced. Through the last year, however, surpluses became commonplace, mainly due to supply growth outside Europe, rather than changing fundamentals within the continent.

EU propylene imports were up 6% on the year for the period of January - October at 303,580 mt. And according to Platts Analytics, the European propylene market is expected to come under pressure due to a further increase in imports this year as new Asian capacity comes online and redirects Middle Eastern material to Europe.

In 2017, Asia looks to lead the way in supply growth, while the US is also expected to increase propylene supplies from its refineries.

Although ethane and LPG cracking is on the rise in Europe (which yields less propylene per mt of ethylene compared to the main feedstock used, naphtha), reducing European production, this drop will be more than made up for by increased propylene and related derivatives production in 2017 - welcome news to buyers.

Asia set up for a 2017 supply glut
In 2017, Asia is set to experience a propylene supply glut. A spate of new on-purpose propylene supply amid a relatively

GLOBAL POLYPROPYLENE PRICES

| Source: Platts |
light steam cracker maintenance schedule has led to expectations that Asia will see propylene length through the year. In addition, existing on-purpose propylene producing units, namely, propane dehydrogenation (PDH) plants which started production through 2015 and early 2016, are now seeing more stable production.

In 2017, the addition of four PDH plants in China is expected, adding 2.21 million mt/year of propylene supply to Asia. These will follow three Chinese PDH plants that were completed in 2016, adding 1.76 million mt/year of propylene supply.

China’s Oriental Energy started up a new PDH plant at Ningbo in November 2016, making it the eighth PDH plant in the country. The plant, which has a propylene production capacity of 660,000 mt/year, follows that of Hebei Haiwei’s in northern China. Hebei Haiwei has been producing propylene as of September from the 500,000 mt/year propylene output unit.

Propane prices, which are expected to remain lower than naphtha in 2017 because of an abundance of supply, should encourage PDH producers to take advantage of this and operate their plants at high rates.

Seven major PDH plants in China are estimated to have run at an average 77% of their processing capacity in November, up from around 67% in October.

New PDH supply, both from new plants and as older PDH units iron out their operational issues and stabilize their run rates, could weigh on propylene prices in 2017.

Adding to this will be on-purpose production from coal-to-propylene units: four Chinese projects due for completion in 2017 will total 1.7 million mt/year of propylene capacity. Coal-to-propylene-producing units are the second cheapest after US PDH plants, according to S&P Global Platts models, due to China’s relatively low domestic coal prices.

Asia’s self-sufficiency means more availability to Europe

The new wave of on-purpose propylene production is likely to impact Europe the same way a supply boost did in 2014, when China saw four PDH additions. These, in addition to bringing Asia as a whole towards self-sufficiency, also encouraged exports. It also meant that regular imports arriving on Far East shores from the Middle East were shunted out and forced to find homes elsewhere.

Imports of propylene into Europe from Asia and the Middle East have, between the months of January and October last year — the latest month for which data are available — totaled 37,297 mt, with similar volumes seen in the same period of 2015 and 2014. In 2013 prior to the first wave of on-purpose propylene expansion, imports in the first 10 months of the year were at 15,614 mt.

Propylene had also made its way from Asia and the Middle East to Europe in more than just its basic form. Of greater impact, major derivative polypropylene had seen a similar doubling of imports into Europe from 2014 onwards. Imports of PP into Europe were at 657,363 mt in January-October 2016 compared to 388,910 mt in the same months of 2013.

Asian PP capacity growth is estimated to outpace demand growth from the region by 760,000 mt in 2016, according to Platts Analytics, which is likely to encourage a marked step up in exports to other regions.

Increases in exports from Asia and the Middle East should also be encouraged by a light cracker turnaround schedule. Only half of the 1.75 million mt/year of propylene capacity that went offline in 2016 will go offline in 2017.

In the US, lower gasoline prices brought increased demand, which as a side-effect of increased gasoline output, resulted in increased refinery-grade propylene (RGP) production. The rise in production helped contribute to higher inventory levels through 2016.
US propylene stocks for non-fuel use were at 4.652 million barrels for the week ending December 9, US Energy Information Administration data showed. Over the course of the year, stocks climbed 48% from the beginning of 2016 when they were at 3.152 million barrels.

US propylene markets generally move in unison. RGP can be further purified into polymer-grade propylene (PGP), or it can be used in the production of alkylate, a high-value gasoline blend stock.

**European PDH plans, recognition of propylene need**

Increases in both Asian and US propylene production should be welcome news for buyers of propylene derivatives in Western Europe, who expect lower propylene output for years to come.

Lower refinery margins on projected increases in crude prices will mean less propylene available from refineries, sources have said. A rise in the use of ethane as a feedstock at steam crackers at the expense of naphtha will also curb European propylene supply.

Naphtha, which produces a healthy yield of propylene, accounts for some 67.5% of all ethylene produced in 2016, but this is expected to fall to just over 64% by 2026 as many companies ship and crack cheap US ethane, which yields very little propylene.

Declining European propylene output, coupled with concern following an unprecedented number of polymer outages which hit European converters in the summer of 2015, led to a greater reliance on PP imports in 2016.

European PP imports from January-October were up 21% year on year to 882,857 mt, the latest data from Eurostat showed.

The reliance on PP imports in expected to grow in 2017, European converters have said. However some have seen an opportunity in this situation. Austria-based Borealis said in September it would look at developing Europe's fourth PDH plant, a 740,000 mt/year plant in Kallo, Belgium.

“It in Europe propylene demand is increasing while the supply growth from steam crackers and refineries is slowing down,” Borealis VP Thomas Van De Velde said in late September. “With the market tightening, an on-purpose propylene investment is needed to ensure a reliable platform for continuous, long-term growth in propylene and its derivatives in Europe.”

The announcement came 18 months after chemical company Grupa Azoty said it would also build a PDH plant, this time in Poland and with a capacity of 400,000 mt/year.

The two new investments will double the number of on-purpose production facilities for propylene in Europe by 2021 and take the total PDH capacity to almost 2 million mt, up from around 800,000 mt now.

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Edited by Maurice Geller, maurice.geller@spglobal.com

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**ASIAN PROPYLENE START UPS (mt/year)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Production Method</th>
<th>Producer</th>
<th>Location</th>
<th>Propylene Capacity (mt/year)</th>
<th>Start Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>PDH</td>
<td>Haiwei Group Hengshui</td>
<td>Hengshui, Hebei</td>
<td>500,000</td>
<td>Q1 2016</td>
</tr>
<tr>
<td>South Korea</td>
<td>PDH</td>
<td>SK Gas/ Saudi APC</td>
<td>Ulsan</td>
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<td>PDH</td>
<td>Jiangsu Halji Chemical</td>
<td>Dafeng, Jiangsu</td>
<td>750,000</td>
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<tr>
<td>China</td>
<td>PDH</td>
<td>Ningbo Fortune</td>
<td>Ningbo, Zhejiang</td>
<td>660,000</td>
<td>Q4 2016</td>
</tr>
<tr>
<td>China</td>
<td>PDH</td>
<td>Fujian Meide Petrochemical</td>
<td>Fuzhou, Fujian</td>
<td>660,000</td>
<td>Q1 2017</td>
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<tr>
<td>China</td>
<td>PDH</td>
<td>Tianjin Bohai Chemical</td>
<td>Tianjin</td>
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<td>Q2 2017</td>
</tr>
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<td>PDH</td>
<td>Guangdong Peng Zun</td>
<td>Zhanjiang, Guangdong</td>
<td>450,000</td>
<td>Q3 2017</td>
</tr>
<tr>
<td>China</td>
<td>PDH</td>
<td>Haiwei Group Hengshui</td>
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<td>500,000</td>
<td>Q4 2017</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>PDH</td>
<td>Kazakhstan PI</td>
<td>Atyrau</td>
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<tr>
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<td>CTD</td>
<td>Shaanxi Yulin ECC</td>
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<td>600,000</td>
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<td>Shenhua Group</td>
<td>Xinjiang, Urumqi</td>
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<td>Shaanxi, Yulin</td>
<td>300,000</td>
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<td>China</td>
<td>CTD</td>
<td>Sinope / Wanbei CEG</td>
<td>Anhui, Huaian</td>
<td>350,000</td>
<td>2017</td>
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</tbody>
</table>

Source: Platts