

December, 2020

The Chemical Reaction



Introduction

Welcome to The Chemical Reaction, where our team of experts keeps you up to date with all things Chemicals. Find highlights on current events, key trends and much more in the content below. Interested in learning more on a certain subject? Navigate to a report through the links included or reach out to one of our qualified analysts for more information.

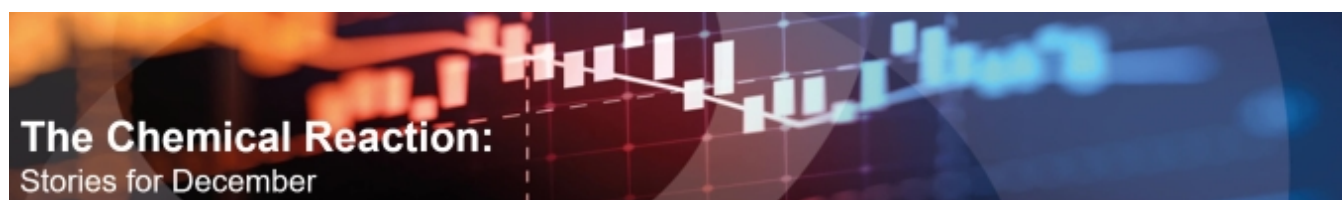
Thematic Page

- **In Focus - Ethylene Asset Cost Tool:** [LG Chem partners with Neste for petrochemical feedstock from bio-materials](#)
- **Chemical Solutions:** [Can chemical recycling improve the sustainability of the chemicals value chain?](#)
- **Events:** [China Energy and Chemicals Industry Development Report Launch Event 2021 \(17 December\)](#)

Latest Insights

- [North American PX trade: the changing landscape](#)
- [Propylene long-term service enhancements](#)
- [Reimagining European ethylene: an assessment of closure threat risk to 2030](#)
- [Polyesters after Covid-19: towards 2030, and beyond](#)
- [Styrene long-term service enhancements](#)

Q4 2020



MEG European Anti-Dumping Duty investigation: does it all add up in a market desperately seeking imports (again)?

Andrew Day, 15 December 2020

Issue

- Back in October, the European market was notified by the EU Commission of commencement of an Anti-Dumping Duty (ADD) investigation on MEG imports into EU28 from the US and Saudi Arabia. Complaints had been raised by European MEG producers which the EU Commission deemed worthy of investigation over the period from 1 July 2019 to 30 June 2020.
- There can be no doubt that the cost structure of US and Saudi Arabian MEG is lower than that in Europe, based on ethane economics. Indeed, European producers are actively (and ironically?) importing as much US ethane as possible to displace a proportion of naphtha feed to lower their production costs.



- As data collection and hearings with the EU Commission complete, now begins the investigation in earnest. Meanwhile, we sit in a European market dynamic today that is extremely tight on MEG (and even tighter on DEG). So which imports will rescue Europe from the latest tightness?

Implications

- The announcement of the European ADD investigation caused disruption and uncertainty to the annual MEG contract negotiations for 2021 business. For those usually involved in sourcing MEG from US and Saudi Arabian origins for either resale or use in Europe, it was very much about working out a contractual form of words to deal with ADD should it come along. Besides that, a number of contracts aimed instead at European producers to make things more certain.
- Europe is a net import market for MEG with insufficient regional production capacity to cover the market demand, and no MEG capacity investments in sight. Currently, production issues in Europe once again create a very tight market - in fact one of the European producers, a part of the original complaint to the EU Commission, had an unfortunate force majeure situation on EO/MEG as of 9 December 2020 at their Cologne, Germany production asset.
- Should a significant ADD appear that would surely damage Antifreeze and PET production in Europe, and how to balance that damage with the injury that the European producers claim to have suffered already - a challenge for the EU Commission investigation, no doubt.
- Should an ADD of, say €100/t, appear, that is a potentially devastating €35/t and €90/t increase on costs of PET and Antifreeze production, respectively. If the value of MEG in Europe were higher as a consequence of a high ADD, that surely would attract a whole new range of import sources.
- No-one or no market likes uncertainty, but when it comes to MEG that is what we have at the moment. Nonetheless, the market is used to that. After all MEG values have been up and down markedly over the years; availability has been long and short over the years. The market always seems to find a way to work things out and survive to fight and live another day... right?

Outlook

- How the ADD investigation will turn out is difficult to read. Looking back in time, from 2015 to 2019 inclusive, Saudi Arabian imports averaged around 504 ktpa while US tonnages averaged 130 ktpa over the same period. However, in year 2019 the US import tonnage dramatically increased to almost 270 kt for the year.
- The ADD investigation could result in provisional anti-dumping duty being imposed within 7 to 8 months (May/June 2021) and definitive anti-dumping duty in 13 to 14 months (November/December 2021).
- Should a significant ADD be put in place, what then? Will European MEG demand for PET and Antifreeze production be mortally wounded? Will other countries step into the breach and significantly ramp up MEG imports, so creating new levels of competition? Will European producers build new MEG production capacity to plug the gap that way – something that seems very unlikely if not impossible to imagine?
- In the short term, as we have already seen, anything to interrupt or affect regional MEG availability will generate extreme price volatility and with all the drama and emotions that entails - MEG price storms, we might call them. As for the current tightness, is it déjà vu? Will Europe again have to look to Asia for MEG supply assistance? There will be an arbitrage window opening just as there was in late August/September.
- In the longer term, the MEG market is globally over supplied. The capacity builds across the world, notably in China and in the US have pushed the market longer and longer - and there are still more builds to come. Across this decade out to 2030, we have an average global MEG utilisation rate at around 63% - surely that is unsustainable. So who will blink first with MEG values relative to feedstocks at low and likely lower levels for years to come, and who will be able to stay the course?



- In the end, how things turn out for the ADD investigation, for the wider market overcapacity, for the current tight availability will be the story to tell. Stay tuned to our reports, articles, and datasets and keep in touch with all of the present and the future thinking on these hot topics.

Ascend force majeure in Florida: a deeper analysis

Quentin de Carvalho, 14 December 2020

Issue

- On 28 November 2020, Ascend's plant in Pensacola, FL, was shut down due to an unplanned power disruption affecting the primary and secondary electrical lines to the plant.
- This plant had already suffered from the impacts of Hurricane Sally in September but Ascend managed through those impacts to avoid a Force Majeure declaration.

Implications

- There is no force majeure declaration for intermediate production in Pensacola plant, including adipic acid (500 ktpa), hexamethyl diamine / HMD (210 ktpa), ketone-alcohol oil (KA Oil), and polyamide (PA) salt. Those plants restarted the following week after the interruption.
- Ascend's plant in Decatur, AL, which produces adiponitrile / ADN (400 ktpa) and HMD (210 ktpa), was not affected and is producing at full capacity. In fact, the ADN plant is running at a significantly higher rate than capacity, as Ascend plans to expand the plant capacity to 490 ktpa.
- Restoring supply reliability is key and we can confirm that Ascend is deploying over 700 additional personnel on the Pensacola plant to restore full production quickly. The plant is estimated to be restored in a few weeks.
- In the meantime, each continuous polymerisation line that has been restored will immediately start operating. The polymer availability should improve in the next weeks.
- Due to the nature of Ascend's integrated manufacturing model, the company is still able to operate its batch polymerisation units at normal capacity. For instance, Greenwood batch polymerisation has been operating at full capacity and the Pensacola batch polymerisation has quickly returned to normal capacity.

Outlook

- The market was already short even before this event due to a significant demand increase, limited ADN production from Invista's plant at Butachimie (France) and a scheduled shutdown at Invista's ADN plant at Victoria, TX.
- If the limited duration of the polymer production constraints is confirmed, the impact on the market should be also limited and significantly lower compared to 2018.
- Fortunately, December is typically a shorter demand month with less effective working days and the end of the year minimum inventory policy. The plan is that when January comes, this Pensacola event will be already solved.
- All eyes will be turned to Pensacola in the next weeks. We will continue to follow the events and share more details in our reports.



North American PX trade: the changing landscape

Hugh Hartzog, 14 December 2020

2020 has been a challenging year for paraxylene (PX) markets. The deleterious effects of the COVID-19 pandemic, combined with the large PX capacity expansions over the past two years in Asia, have made a challenging situation for PX producers even more difficult. The hurdles facing the North American PX industry are reflected in the changing trade dynamics that have subsequently materialized, with the region's net trade deficit nearly doubling since 2019, while import sources have increasingly diversified.

Click through the [link](#) to access this insight that explores the reasons for changing trade dynamics.

Propylene long-term service enhancements

Catherine Tan, Patrick Kirby, 14 December 2020

We have made some significant enhancements to the recently published *Propylene global supply demand analytics service – October 2020*.

The service now includes:

- Extended supply and demand analytics to cover 65 countries where propylene and derivatives are produced, consumed and traded, up from 41 countries/regions previously
- Published trade grids analysis for the years 2015 to 2019
- A leaner, more user-friendly excel dashboard

This insight aims to provide the key takeaways from the enhanced analysis and serves as a walkthrough guide of the new data and enhancements.

Overview of service enhancements:

1. New country-by-country supply-demand balances
2. Key takeaways from new country-level balances
3. Deliverable streamlining
4. User-defined chart selections
5. Trade Grids
6. New Olefins landing page on WoodMac portal
7. Enhancements to our Monthly olefins services

For more details on each of the improvements, please click through the [link](#) and download the accompanying slide pack.



Reimagining European ethylene: an assessment of closure threat risk to 2030

Patrick Kirby, 10 December 2020

Through the next decade, the installed global ethylene capacity is expected to increase by over one-third, reaching 263 million tons in 2030. Capacity additions are being driven by access to local market consumption growth or feedstock advantage and monetisation. At just under 23 million tons, the European market (EU15+Norway) accounts for 12% of the global total. This proportion is forecast to fall to 8% by 2030, driven by net closures in Europe occurring in parallel to dramatic expansions of capacity in other parts of the world.

A significant amount of capacity consolidation has already taken place in Europe over the last decade. In parallel, many European ethylene assets have invested in feedstock flexibility or asset strengthening programmes since this point - finding closure candidates in the European region has become more complex and intricate. Nevertheless, the fundamentals of cost competitiveness not only in ethylene but in increasing global trade of ethylene derivatives point to this being a needed aspect of market continuity.

Wood Mackenzie analysis forecasts that over 3 million tons of European ethylene capacity are at medium-high risk of closure during the 2020 decade. Balanced with a new investment in ethylene from INEOS in Antwerp, Belgium with a capacity of 1,450 ktpa, this would represent a net reduction in European ethylene capacity of around 1.5 million tons or 7% of the current level by 2030. Wood Mackenzie identifies primarily locations for this capacity consolidation to take place like Italy, Germany, the UK and France. This insight will explore the key assumptions behind this conclusion and highlight the relative strengths and weaknesses of assets operating in these locations relative to the wider European ethylene market.

Deploying Wood Mackenzie's ethylene asset cost tool, [this insight](#) will explore the key assumptions behind this conclusion and highlight the relative strengths and weaknesses of assets operating in these locations relative to the wider European ethylene market.

Surging Asian freight rates disrupt PET market

Alexandra Tennant, 10 December 2020

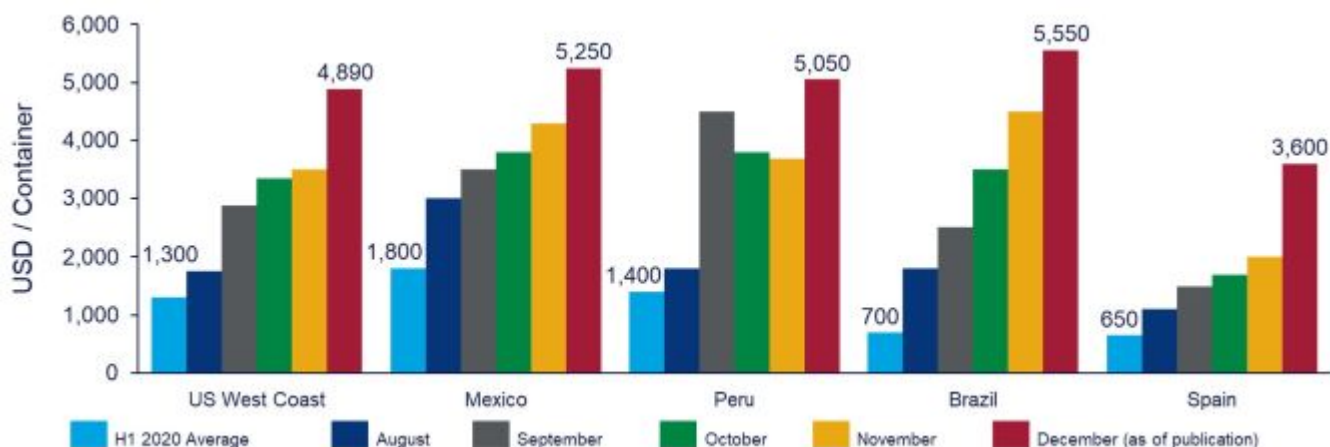
Transpacific freight rates from Asia remained largely steady following the early impacts of the coronavirus pandemic on world trade. Yet, as the demand for products from Asia returned in the second half of the year the freight market has been unable to keep pace with swelling demand to deliver Asian products abroad. Freight costs are now a global concern.

The initial pressure point was demand for space on outgoing vessels after freight companies had reduced sailings and increased port visits to maximize the efficiency of each voyage. Shipping companies increased sailings and capacity to meet market demand, but remain stymied by the imbalance of containers that had sailed away from Asia but remained empty abroad and not destined for an immediate return to Asia. These containers remain empty due to both a lack of exports available to be shipped in their current ports but also favorable terms initially provided to importers of product that provided prolonged access to the containers to facilitate trade in the midst of logistics complicated by the pandemic.

Lacking access to a steady supply of containers and a market thirsting for product, Asian exports began to face swiftly rising freight rates beginning in September. As a result of these costs, producers began to delay shipments in hopes of securing less expensive freight charges or attempted to renegotiate prices with customers to defray the cost. The resulting lack of reliability in shipments has compounded supply chain complications for downstream customers.



Shipping container market rates from Shanghai



Source: Wood Mackenzie Chemicals

In regions such as South America, where domestically produced commodities such as PET are priced at import-parity, the impact of rising freight is especially severe for local markets that are heavily reliant on imported materials. These contracts are often structured with a lagged, or averaged, freight component that has positioned domestic producers to increase prices until the freight market normalises. In Europe, PET imports are now unable to compete on a delivered basis and have been shut out from the European market, creating a shortage in available material and leading to increases in PET prices. Buyers in Southern Europe have been particularly exposed through their traditional reliance on imports, and without access to local production.

Asian export deals of PET and similar commodities into South America and European will continue to remain disadvantaged in import-dependent markets as the freight increases are perceived as high-risk and product delivery is not dependable. Until recently, the delivery of many orders had been protected by contracted freight rates out of Asia that were largely spared the initial spike in freight rates. However, contracts for fourth quarter freight caught up and now largely match market prices. Non-Asian importers report steady import business and strong interest from potential new customers into South America. However, delays in securing import licenses and dollar availability can similarly delay shipments. Additionally the container shortage is no longer limited to outbound Asian freight, exporters from other regions are being positioned to seek to renegotiate prices to compensate for their own higher rates.

Freight rates were believed to have stabilised, if at a high rate, in October, but surged again at the end of November. These rates are now expected to continue to remain high and increase further into the first quarter of 2021 driven by the anticipation that the severe shortage of available containers will continue.

How does the Regional Comprehensive Economic Partnership (RCEP) agreement benefit Asia polyolefins market?

Ashish Chitalia, William Liu, 9 December 2020

Issue

- On 15 November 2020, leaders from 15 Asia Pacific countries signed the Regional Comprehensive Economic Partnership (RCEP) agreement to reduce trade barriers in the region.
- Ten countries from the Association of Southeast Asian Nations (ASEAN) along with China, Japan, South Korea, Australia and New Zealand have established the world's largest free trade agreement. The region encompasses a population of 2.27 billion, with GDP of US\$26 trillion and US\$5.2 trillion of exports.



- In 2020, RCEP members have imported a total of 26.8 million tonnes of polyethylene and 10.6 million tonnes of polypropylene, of which China accounts for 71% and 50%, respectively.

Implications

- Wider benefits of the RCEP are clear: reducing trade barriers to raise the competitive advantage of the regional manufacturing industry; improving regional supply chain connectivity to resist deglobalisation and the uncertainty of external shock; and easing the movement of goods and currency to enhance the regional comparative advantage.
- Polyolefins market within the region will also benefit from RCEP agreement.
- As China already has a free trade agreement with all ASEAN member countries, RCEP will not improve polyolefins exports from these countries. South Korea will benefit the most from RCEP once tariffs are removed, as it represents 83% of the Chinese polyolefins imports from the other RCEP partners, including Japan and Australia.

Outlook

- RCEP countries consist of many developing economies that are expected to modernise rapidly and improve living standards. These are adding new polyethylene capacity to increase self-sufficiency. We don't expect RCEP will benefit polyolefins exports much in these countries.
- RCEP will benefit polyethylene exports from South Korea, Japan and Australia. But as Japanese and Australian exports are limited, South Korea will benefit the most from this agreement.
- The integration of the regional economy will enhance polyolefins competitiveness in many ways. For example, comparative advantages, such as lower labour fees or more highly integrated manufacturing and supply chains, could reduce the total cost of plastic final products.
- The rising competitiveness of plastic end-products within the region will strengthen both exports and domestic consumption, stimulating demand for polyolefins resin.
- Please see this [insight](#) to have a more detailed view on the impact of the RCEP agreement to Asia's polyolefins trade.

Sarawak PetChem announces plans to build a methanol plant in Bintulu, Malaysia

Kelly Cui, 7 December 2020

Issue

- Sarawak PetChem sent a letter of intent to Samsung Engineering for a US\$1.07 billion contract to construct a methanol plant in Bintulu, eastern part of Sarawak, Malaysia.
- The plant will produce 1.7 Mtpa from 2023 and is estimated to cost over US\$1.96 billion to build.
- Petronas, the Malaysian NOC, will supply natural gas for feedstock, which is likely to be sourced from the offshore Sarawak-East Naturan basin, particularly after [the recent gas discoveries in Lang Lebah](#). Additionally, Petronas might use its position in the Sabah basin to supply the plant via the Sabah-Sarawak gas pipeline (SSGP).



Sarawak PetChem's methanol plant location



Samsung Engineering Co.

Implications

- Sarawak PetChem, a state-owned company, was set up in 2017 to undertake, develop, and operate the first methanol plant in the state. This new facility will complement the Sarawak government's aspiration to turn Bintulu into a downstream petrochemical hub.
- Sarawak PetChem and Petronas Chemicals Marketing Labuan (PCML) have signed a 20-year sales and purchase agreement to offtake Sarawak Petchem's methanol production. PCML will act as Sarawak Petchem's arm to market the product for exports.
- PCML is also the marketing arm of Petronas Chemicals Group, which is the largest methanol producer in Asia-Pacific and the fourth-largest producer in the world. Petronas Chemical Group currently holds an annual production capacity of 2.4 Mtpa.

Outlook

- Malaysia is a major methanol exporter in Asia, primarily to China, Indonesia, Singapore and Thailand. The start-up of Sarawak PetChem's 1.7 mtpa methanol plant in 2023 is expected to further increase Malaysia's methanol exports.
- With natural gas feedstock from Petronas, Sarawak PetChem's methanol plant is expected to gain some cost-advantages.
- Wood Mackenzie has recently launched its long-term methanol service, which allow clients identify the key trends underpinning global methanol markets in the next 20 years. Please get in touch if you want to hear more about our methanol coverage and analysis.

Highlights from updated Cumene and Phenol Global Supply Demand Analysis

Darryl Xu, 1 December 2020

Issue

- 2020 has been an unprecedented year for commodity markets, with the coronavirus pandemic and oil price crash causing a major disruption.



- The cumene-phenol chain has also suffered, although the disruption effect on markets has been somewhat buffered by delays in new capacity start-ups.

Implications

- We estimated the phenol market to shrink by almost 3% in 2020. Apart from the disruption across the phenol chain due to the pandemic, there has also been a reduction in phenol-based caprolactam production.
- Automotive and construction are two important end-users of phenol derivatives; both sectors have experienced demand destruction due to Covid-19.
- Uncertainties in the automotive sector remain despite a quick recovery in some countries. This could derail consumer spending and delay automotive demand recovery. Meanwhile, lower levels of business activity will slow down the pace of demand recovery in the construction industry.
- A wave of integrated phenol and downstream capacity additions have been entering the market starting from H2 2020. This should soften the phenol market and lower phenol prices, which will drive the recovery of cumene/phenol consumption in the caprolactam sector.
- Operating rates are forecasted to dip below 80% in the next few years, but recovery should be swift.

Outlook

- Overall phenol production margins will fall and bottom out in 2022.
- We expect the global phenol market to be resilient despite short-term challenges. In the longer term, more investments are needed to meet demand growth in key markets.

Polyesters after Covid-19: towards 2030, and beyond

Salmon Lee, 1 December 2020

The pandemic has brought some in the polyester chain to their knees, but those who can recognise the big trends shaping the industry's future will ride the waves of opportunity.

As the pandemic comes under control in some parts of the world, and eventually ends with the arrival of a series of vaccines, the polyester chain is also undergoing profound changes in a post-coronavirus world. We see six big trends shaping the way the polyester market is evolving. By the end of the decade, it is likely that the industry would become unrecognisable for many players who have been following this evolution.

Click through the [link](#) to access the full insight.

SK Global Chemical to permanently shut No. 1 cracker in South Korea in early December

Catherine Tan, 1 December 2020

Issue

- SK Global Chemical (SKGC) announced on 26 March that it will permanently close its 190 ktpa steam cracker from December 2020 due to its lack of competitiveness. The shutdown date has now been set for 8 December.

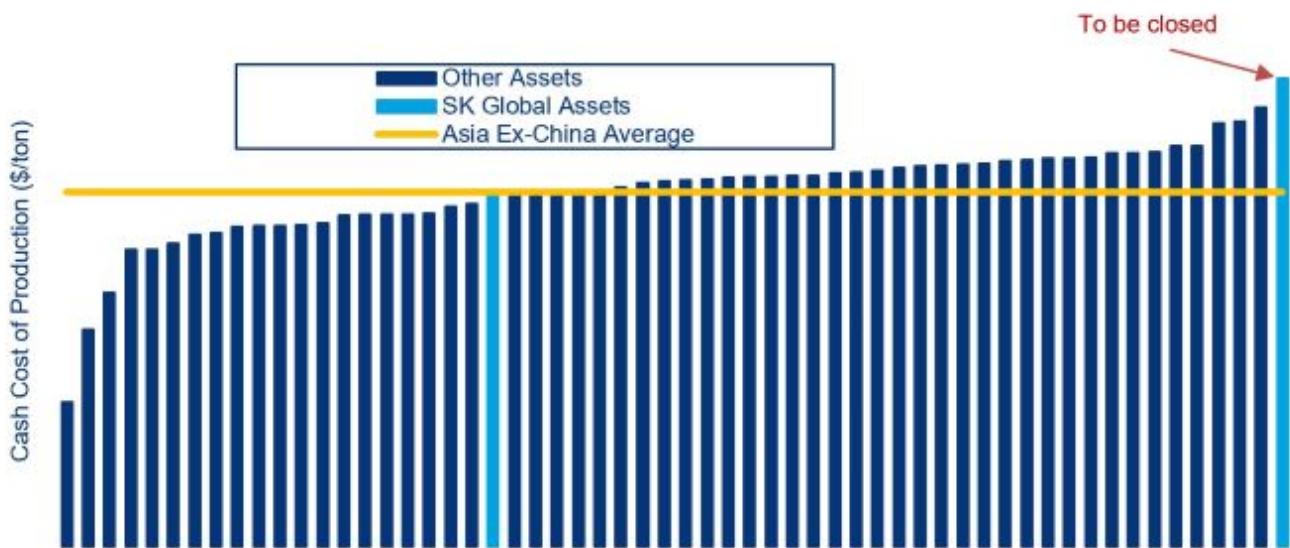


- SKGC has been operating two crackers at Ulsan since 1972, with a total ethylene capacity of 870 ktpa. The ethylene produced by the cracker is currently consumed by its downstream polyethylene (PE) units at the same location. The cracker also has a propylene nameplate capacity of 140 ktpa and an associated 32 ktpa butadiene unit. A 40 ktpa ethylene propylene diene monomer (EPDM) unit was shut earlier in Q2 this year.

Implications

- SKGC’s No.1 190 ktpa cracker has been one of the highest cost assets in Asia ex-China and represents 2% of South Korea’s total ethylene capacity. With a capacity less than a third of its No.2 cracker, its fixed cost of production is almost double that of SKGC’s other larger cracker at Ulsan.
- The No.1 cracker consumes only naphtha as feedstock. The lack of feedstock flexibility at this small unit further undermines the asset’s competitiveness.
- The cracker was the only asset that remained offline for over two years from October 2008 following the last global recession. Its cost position on Wood Mackenzie’s Ethylene Asset Cost Tool had flagged it as a likely candidate for rationalisation in the upcoming cyclical downturn, and SKGC’s official decision corroborates this view.

2019 Ethylene Cost of Production for Asia Ex-China, highlighting SK Global Assets



Source: Wood Mackenzie Chemicals Ethylene Asset Cost Tool

Outlook

- In the short term, the loss of supply from SKGC’s No.1 cracker will exacerbate the current supply tightness in the Asian olefins markets due to several unplanned outages. In the longer term however, the capacity rationalisation is something that the market sorely needs more of.
- SKGC’s No.1 cracker shutdown will mark the beginning of significant rationalisation in the ethylene industry that we expect will be needed to counter the coming wave of over-investment. From now to 2025, Asia will see approximately 35 million tons of ethylene capacity additions, mostly led by China. Smaller and higher-cost assets are expected to be idled or shut eventually, but the coronavirus pandemic may have accelerated the rationalisation process.



Wood Mackenzie Chemicals

Trusted, in-depth, unique. Full chemical chain analysis.

The petrochemicals industry landscape is shifting at an alarming pace. Only one thing seems certain: the coming decade will be shaped by the coronavirus crisis. Consumer behaviour, investment decisions, the corporate landscape and even the path of globalisation will be influenced by its effects.

It's never been more important to have a wide view of the path ahead – while keeping a sharp focus on your key markets.

We can help you build a clearer picture of the chemicals, polymers and fibres industries. And we can enhance your strategic planning with robust and integrated solutions.

- Assess market trends and plan for the future with detailed forecasts and analysis
- Gain insight into topical industry issues, from feedstocks through derivatives to end-use segments
- Pinpoint investment opportunities and threats
- Understand sustainability and recycling, and how they affect conventional business strategies

Visit: [woodmac.com/chemicals](https://www.woodmac.com/chemicals) to find out more or contact us on chemicals@woodmac.com.

Disclaimer

Strictly Private & Confidential

These materials, including any updates to them, are published by and remain subject to the copyright of the Wood Mackenzie group ("Wood Mackenzie"), and are made available to clients of Wood Mackenzie under terms agreed between Wood Mackenzie and those clients. The use of these materials is governed by the terms and conditions of the agreement under which they were provided. The content and conclusions contained are confidential and may not be disclosed to any other person without Wood Mackenzie's prior written permission. Wood Mackenzie makes no warranty or representation about the accuracy or completeness of the information and data contained in these materials, which are provided 'as is'. The opinions expressed in these materials are those of Wood Mackenzie, and nothing contained in them constitutes an offer to buy or to sell securities, or investment advice. Wood Mackenzie's products do not provide a comprehensive analysis of the financial position or prospects of any company or entity and nothing in any such product should be taken as comment regarding the value of the securities of any entity. If, notwithstanding the foregoing, you or any other person relies upon these materials in any way, Wood Mackenzie does not accept, and hereby disclaims to the extent permitted by law, all liability for any loss and damage suffered arising in connection with such reliance.

Copyright © 2021, Wood Mackenzie Limited. All rights reserved. Wood Mackenzie is a Verisk business.



Wood Mackenzie™, a Verisk business, is a trusted intelligence provider, empowering decision-makers with unique insight on the world's natural resources. We are a leading research and consultancy business for the global energy, power and renewables, subsurface, chemicals, and metals and mining industries. For more information visit: woodmac.com

WOOD MACKENZIE is a trademark of Wood Mackenzie Limited and is the subject of trademark registrations and/or applications in the European Community, the USA and other countries around the world.

Europe +44 131 243 4400
Americas +1 713 470 1600
Asia Pacific +65 6518 0800
Email contactus@woodmac.com
Website www.woodmac.com