

Chemicals Outlook 2024

Commodity chemicals: What Lies Ahead?

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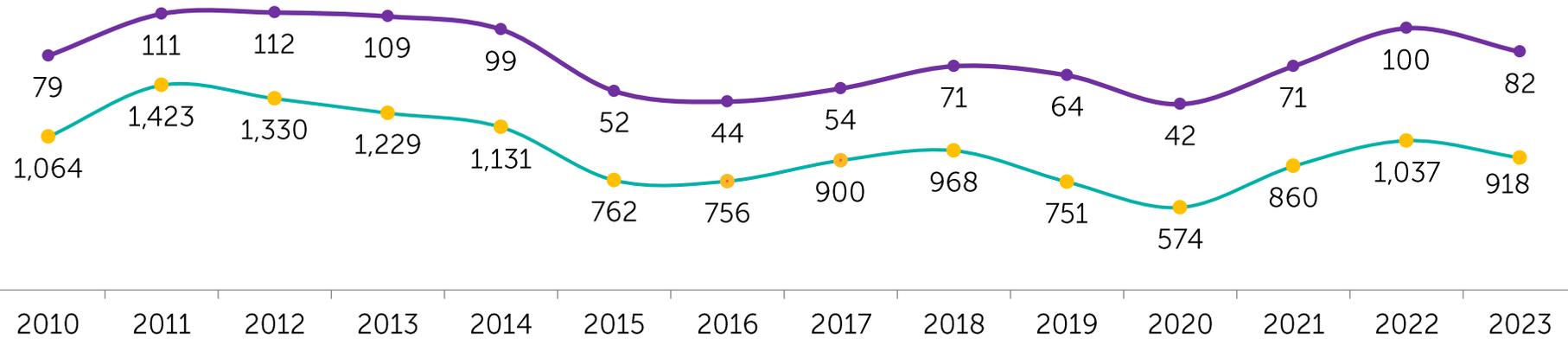


**Chemical Industries
Outlook 2024**
Sarizal Amir

Events in recent years have triggered **unprecedented disruptions** leading to **structural changes with far-reaching implications** to the chemical business

Brent Crude Oil
(USD/bbl)

Petchem Price*
(USD/MT)



* Simple average market price of methanol, ethylene, propylene, butadiene, benzene & paraxylene

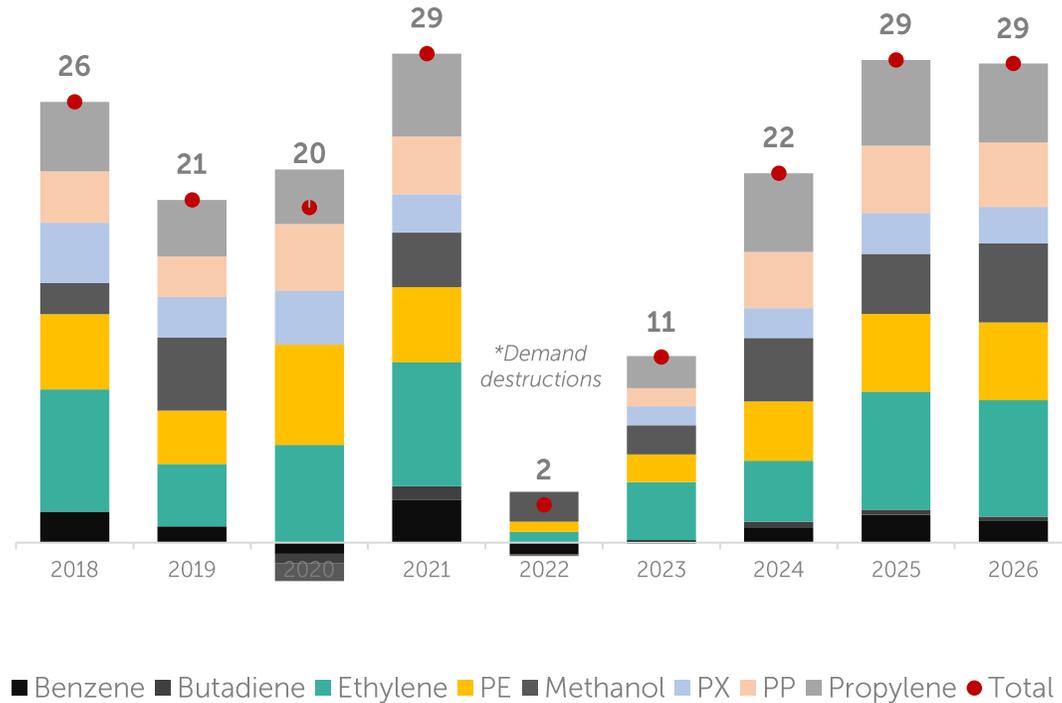
The confluence of crisis factors has resulted in a bearish market and a deceleration of economic activity



Global petrochemical market are expected experience gradual recovery in 2024 driven by improved economic growth, taming of interest rates & resilient consumer spending

Global petrochemicals demand growth

Unit: million tpa



Source: Chemical Market Analytics

Factors driving the supply demand of key market sectors:



Economic Recovery

The ease of inflation, Manufacturing makes a comeback



Growing Population & Wealth

Asia Pacific leading global growth in population & income



Industry consolidation

Integration of refineries, Consolidation of old capacities in China



Sustainability Agenda

Heightened sustainability expectations, Circular economy – waste to products



Net-zero carbon initiatives

Regulations & Incentives
E.g. ESG, CBAM, ETS, CORSIA, Carbon taxation
E.g. IRA, EU Green Deal, Coal Phase-out deal



Technological Advancement

Data driven operations, Development of new & improved chemicals for various applications



Olefins & Derivatives

Ethylene & MEG

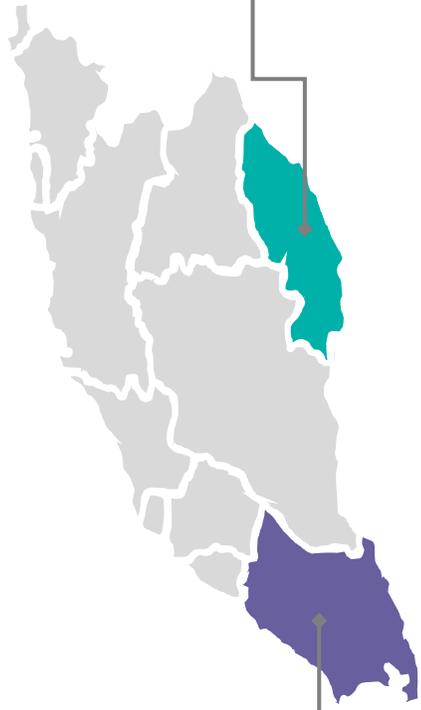
Foo Mun Chuan

Olefins, Glycols & Derivatives: Product Portfolio & Applications (Ethylene & MEG)

Total Product Portfolio

3,400 KMTPA

1,360 KMTPA



2,040 KMTPA

KERTEH IPC

1 PC Ethylene Sdn Bhd (PCESB)



400 KMTPA
○ Ethylene

Technology:
ABB Lummus

End product:



2 PC Olefins Sdn Bhd (PCOSB)



600 KMTPA
○ Ethylene

Technology:
Linde

End product:



3 PC Glycols Sdn Bhd (PCGSB)



360 KMTPA
○ Monoethylene Glycol (MEG)

Technology:
DOW METEOR

End product:



PENGERANG INTEGRATED COMPLEX

1 PIC Petchem Ethylene



****1,300 KMTPA**
○ Ethylene

Technology:
ABB Lummus

End product:



2 PIC Petchem MEG



**** 740 KMTPA**
○ Monoethylene Glycol (MEG)

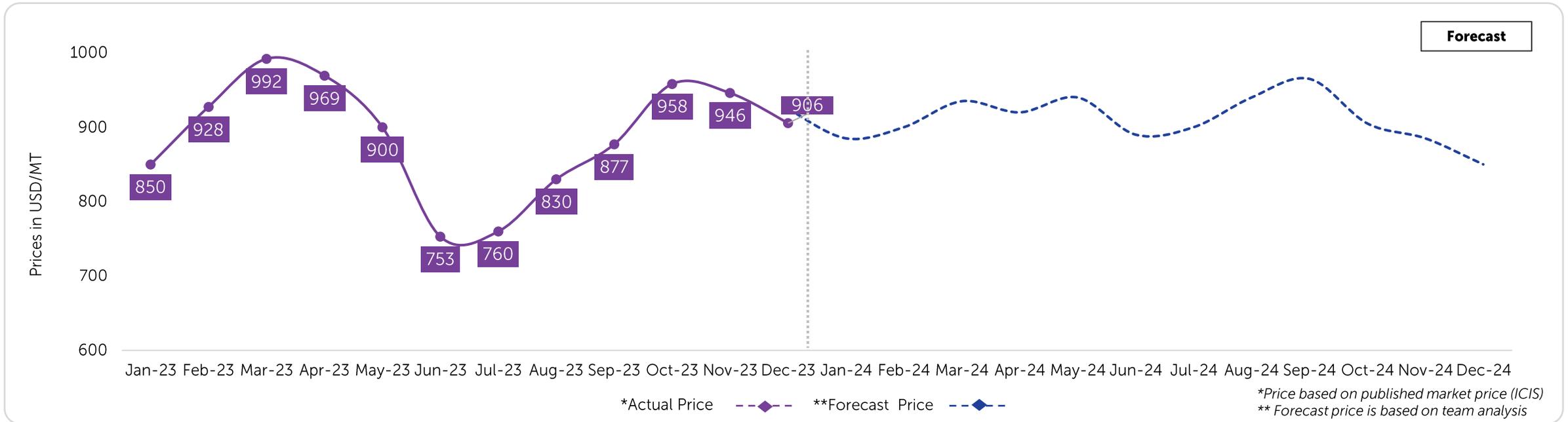
Technology:
Shell Master

End product:



** Based on total design capacity

Ethylene outlook: A stable outlook is expected in 2024 supported by anticipation of an improving supply-demand balance in Asia.



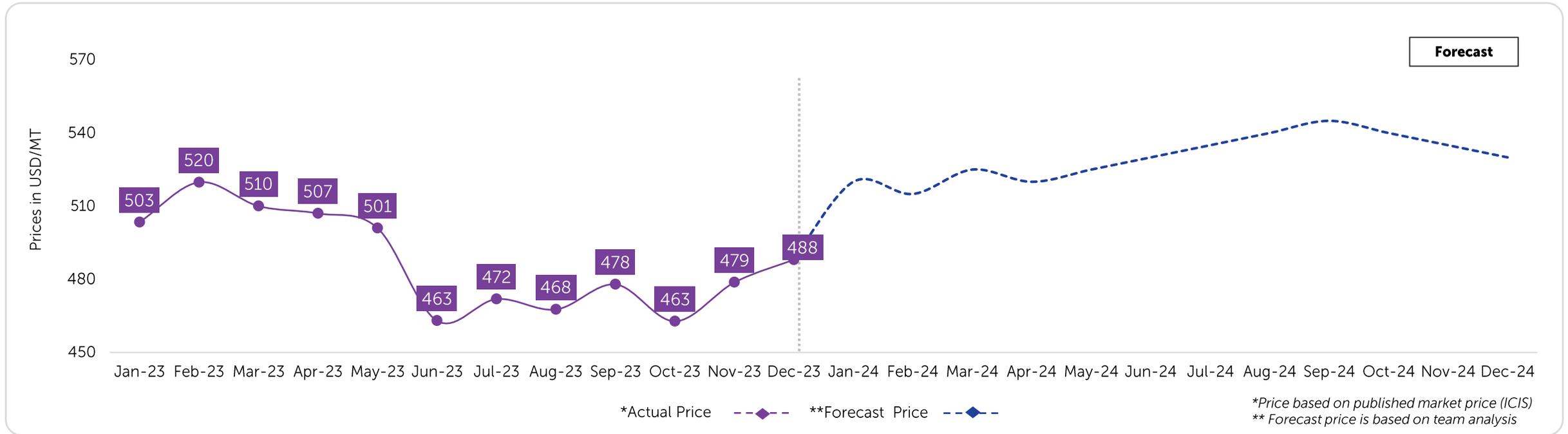
2023 Overview

- Ethylene prices declined in 2023 compared to 2022 due to volatile feedstock prices and poor demand in downstream sectors.
- Chinese ethylene demand grew less than expected, due to lower-than expected consumer spending post lifting of Covid-19 restrictions.

2024 outlook – Stable

- Potential increased profitability among ethylene producers amidst fluctuations in crude oil and natural gas prices could result in favorable impacts on feedstock costs.
- Additional capacity of 5 million MT in 2024 coming from mainland China.
- Ethylene demand in Asia is forecasted to increase by 16% in 2024 compared to the year 2022-2023.
- The packaging sector is expected to improve, driven by anticipated robust growth in food and beverage production in China and India.

MEG outlook: Stable outlook in 2024 due to capacity expansion, with potential price improvements to alleviate negative margins



2023 Overview

MEG price was lower in 2023 as compared to 2022 due to poor demand and long supply in Asia amidst global economic recession.

2024 outlook – Stable

- Long supply in the market due to massive capacity expansion in 2024.
- Upstream costs for MEG producers remain a challenge due to volatile crude prices. Average MEG operating rate is anticipated to be flat at ~60%.
- The polyester market is expected to improve with China's economic recovery.
- Average polyester operating rate is approximately between 85-90%.



Olefins & Derivatives

Polymers (LDPE, LLDPE, HDPE)

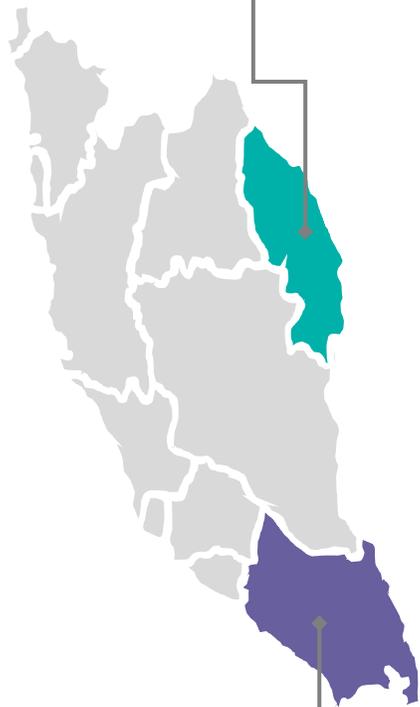
Shazali B Wosnin

Polymer Products Portfolio & Applications

Total Product Portfolio

1,320 KMTPA

495 KMTPA



825 KMTPA

KERTEH IPC

1 PETRONAS Chemicals LDPE Sdn. Bhd. (PCLDPE)

255 KMTPA

- Low Density Polyethylene (LDPE)

Technology:
SABTEC Clean Tubular

End product:



2 PETRONAS Chemicals Polyethylene Sdn. Bhd. (PCPSB)

240 KMTPA

- High Density Polyethylene (HDPE)
- Linear Low Density Polyethylene (LLDPE)

Technology:
Innovene G Ineos Technologies

End product:



PENGERANG INTEGRATED COMPLEX

1 PIC Petchem LLDPE

****350 KMTPA**

- Linear Low Density Polyethylene (LLDPE)
- Metallocene (mLLDPE)

Technology:
Innovene G Ineos Technologies

End product:



2 PIC Petchem HDPE

**** 400 KMTPA**

- High Density Polyethylene (HDPE)

Technology:
LyondellBasell Hostalen ACP

End product:



3 PIC Petchem PP Spherizone

**** 450 KMTPA**

- Homopolymer
- Random Copolymer
- Terpolymer
- Impact Copolymer

Technology:
LyondellBasell PP Spherizone

End product:



4 PIC Petchem PP Spheripol

**** 450 KMTPA**

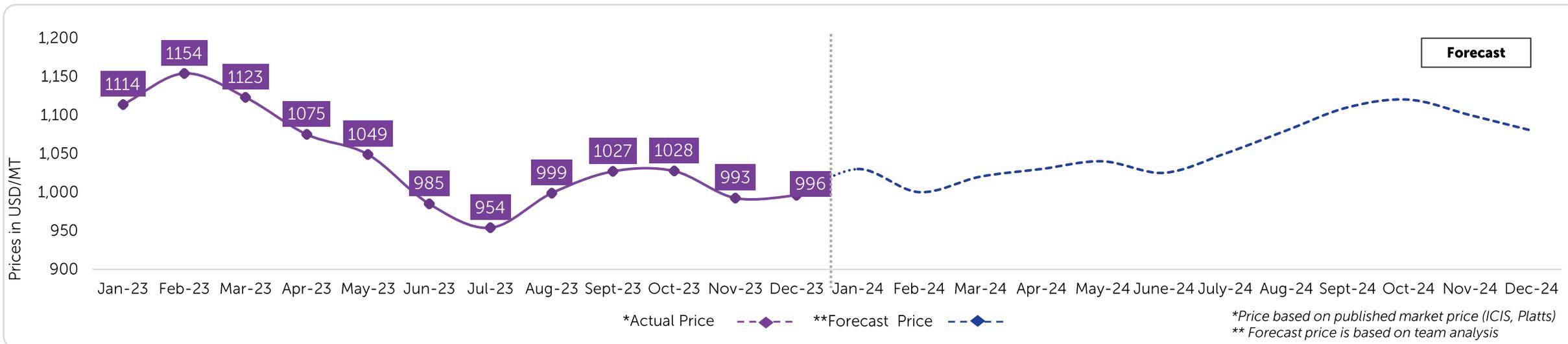
- Homopolymer
- Random Copolymer
- Terpolymer

Technology:
LyondellBasell PP Spheripol

End product:



LDPE Outlook: Easing inflation is expected to improve consumer spending, hence boosting packaging & agricultural film demand leading to firmer LDPE prices in 2H 2024



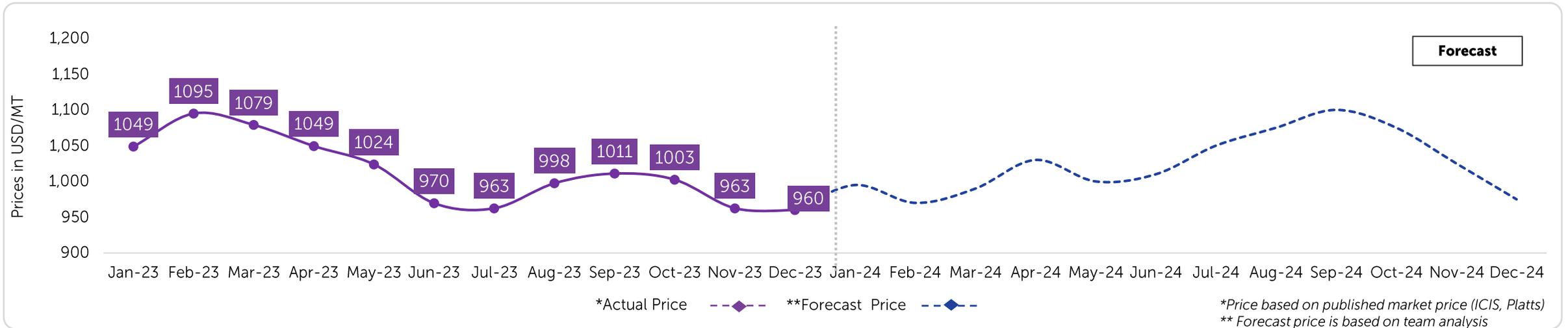
2023 Overview

- Price was softer for LDPE in 2023 with an average of USD1,041/MT compared to USD1,428/MT in 2022
- Weak demand was attributed to lower consumption in the food and packaging sectors as well as under-whelming demand during high season in the agricultural film sector.
- LDPE prices witnessed the largest decline since 2022, having its premium against LLDPE/HDPE due to weakened Ethylene-vinyl acetate (EVA) demand and price.

2024 Outlook – Slightly firmer

- General economy is expected to pick up in 2H 2024 following flattish 1H 2024 if easing of inflation materialises. This in turn may trigger upward downstream demand for LDPE applications such as food packaging and agricultural film.
- LDPE oversupply is expected to decrease upon rise in EVA which will cause LDPE supply to be absorbed by use in production of photovoltaic cell and footwear in 2Q 2024.
- During the typical demand season peak in 3Q, converters are expected to restock ahead of year end festivities coupled with increase in agricultural demand.
- Red Sea conflict is expected to prolong pushing the freight cost up as vessels have to divert using longer route to their destination.

LLDPE Outlook: Gradual ease of inflation coupled with relatively lower supply additions in Asia region support LLDPE price recovery



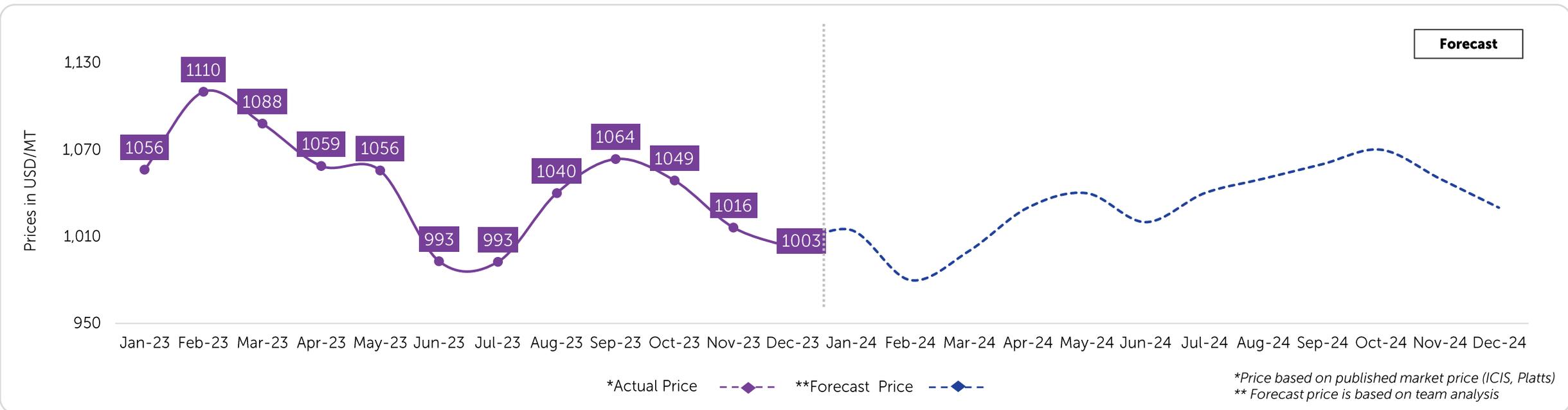
2023 Overview

- Average LLDPE prices in 2023 was at USD 1,013/MT, lower by USD 194/MT compared to USD1,208/MT in 2022
- Market sentiment was mostly bearish as downstream demand recovery was constrained by slow economic growth, high inflation rate and weakening purchasing power.
- Market saw cautious buying behavior caused by regional capacity additions, i.e., China with 0.6 million MTPA and Vietnam with 0.5 million MTPA.

2024 outlook –Slightly firmer

- Sluggish start of the year as China demand shows no robust improvement while SEA demand stagnates with increasingly competition.
- Anticipation of easing inflation rate could provide optimism in demand recovery albeit at a slower pace.
- Increases regional supply from new start up may limit price uptick.
- Food packaging, stretch film and agricultural film is likely to see stable to firmer demand on recovering economic growth.
- The ongoing Red Sea tension may further disrupt trade flows and increase freight rates while import quota implementation by Indonesian government in March could potentially support the market sentiments.

HDPE Outlook: Price is forecasted to be stable despite intensified market competition contributed by new additional capacities in SEA and China region on the back of global recovery economy in 2024.



2023 Overview

- Average HDPE prices in 2023 decline to USD1,044/MT from USD1,203/MT in 2022, due to weaker downstream finished goods demand and stiff price competition among sellers.
- The prices were mostly supported by supply tightness following plant shutdowns and reduced plant utilisation as compared to LLDPE & LDPE
- Between January and October, China's HDPE imports saw a substantial decrease of 15.8% year-on-year.

2024 outlook – Stable

- Buying sentiment remains cautious despite anticipated improvement in global economic growth, ease of inflation in 2H 2024 and downstream demand recovery.
- China's HDPE imports continue to decrease as rising domestic production rates and new capacities, further intensifying market competition.
- The Red Sea conflict may limit supply from Middle East to Asia as shipping lines increase their freight rates and insurance fee, reducing the supply in Asia hence supporting HDPE prices.



Olefins & Derivatives

Paraxylene & MTBE

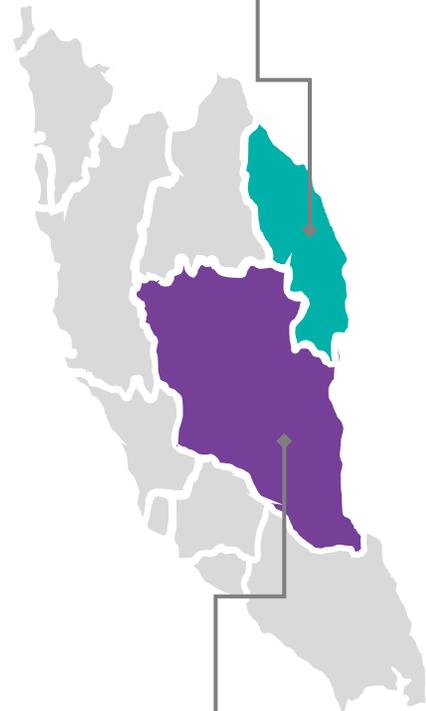
M Nizam B M Yusof

Aromatics and MTBE : Product Portfolio & Applications (Paraxylene & MTBE)

Total Product Portfolio

3,400 KMTPA

500 KMTPA



330 KMTPA

1



PC Aromatics Sdn. Bhd.
(PCARO)



500 KMTPA

○ Paraxylene



Technology:
Honeywell
UOP



End product:



2



PC MTBE Sdn. Bhd.
(PC MTBE)



330 KMTPA

○ MTBE



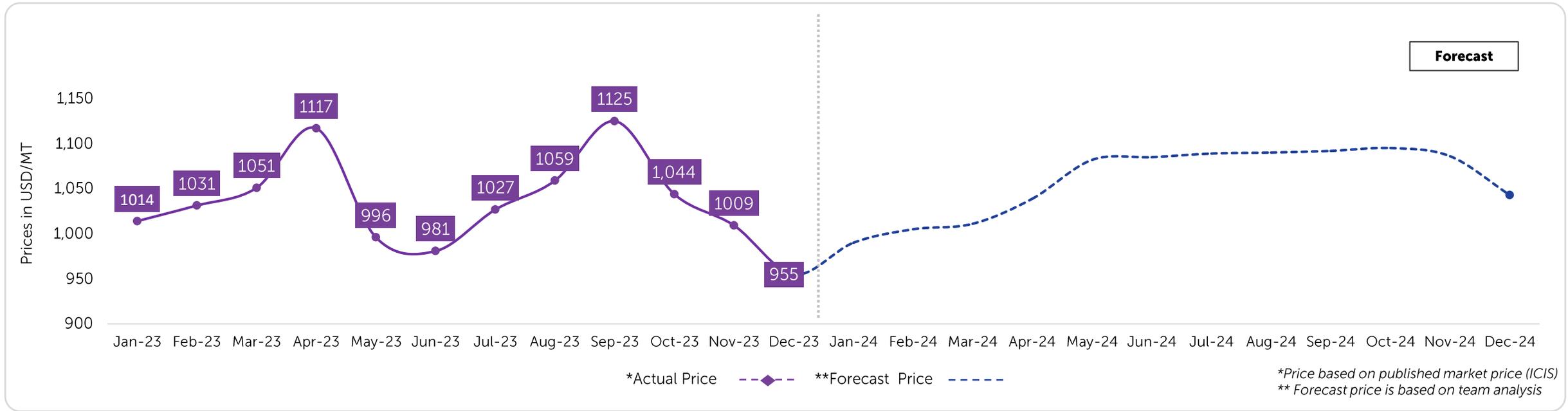
Technology:
Honeywell
UOP



End product:



Paraxylene Outlook: Aromatics margins is expected to be remain strong due to refining rationalization and stable downstream demand



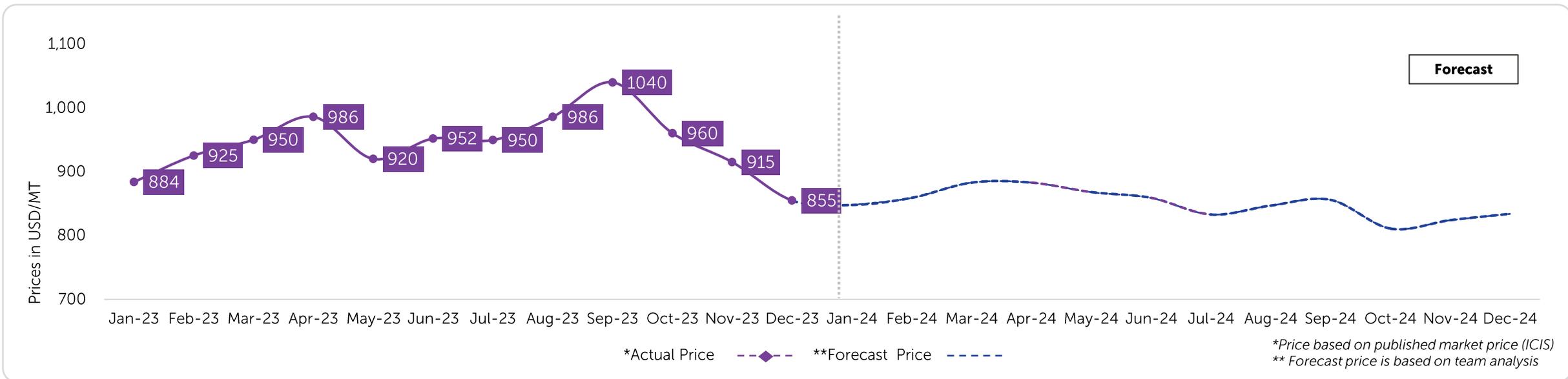
2023 Overview

- Aromatics stronger than expected, following optimization into gasoline pool due to higher demand and margin. The motor gasoline (mogas) crack spread vs dated Brent hit a new high at close to USD 30.00/bbl.
- Supply was short as naphtha was optimized into gasoline instead of aromatics. Paraxylene-naphtha spread hit above USD 400/MT from March to November 2023.
- Downstream demand for PTA and styrene is expected to be stable with stabilizing operating rates.

2024 Outlook – Strong

- Rising gasoline demand owing to continued geopolitics concerns especially in Europe and Middle East.
- Price will see support from refining rationalisations to ensure prudent capacity.
- However, downstream PTA demand appear stable as most operating units are expected to remain online at stable rates.

MTBE Outlook: MTBE is expected to be stable supported by anticipated strong gasoline demand

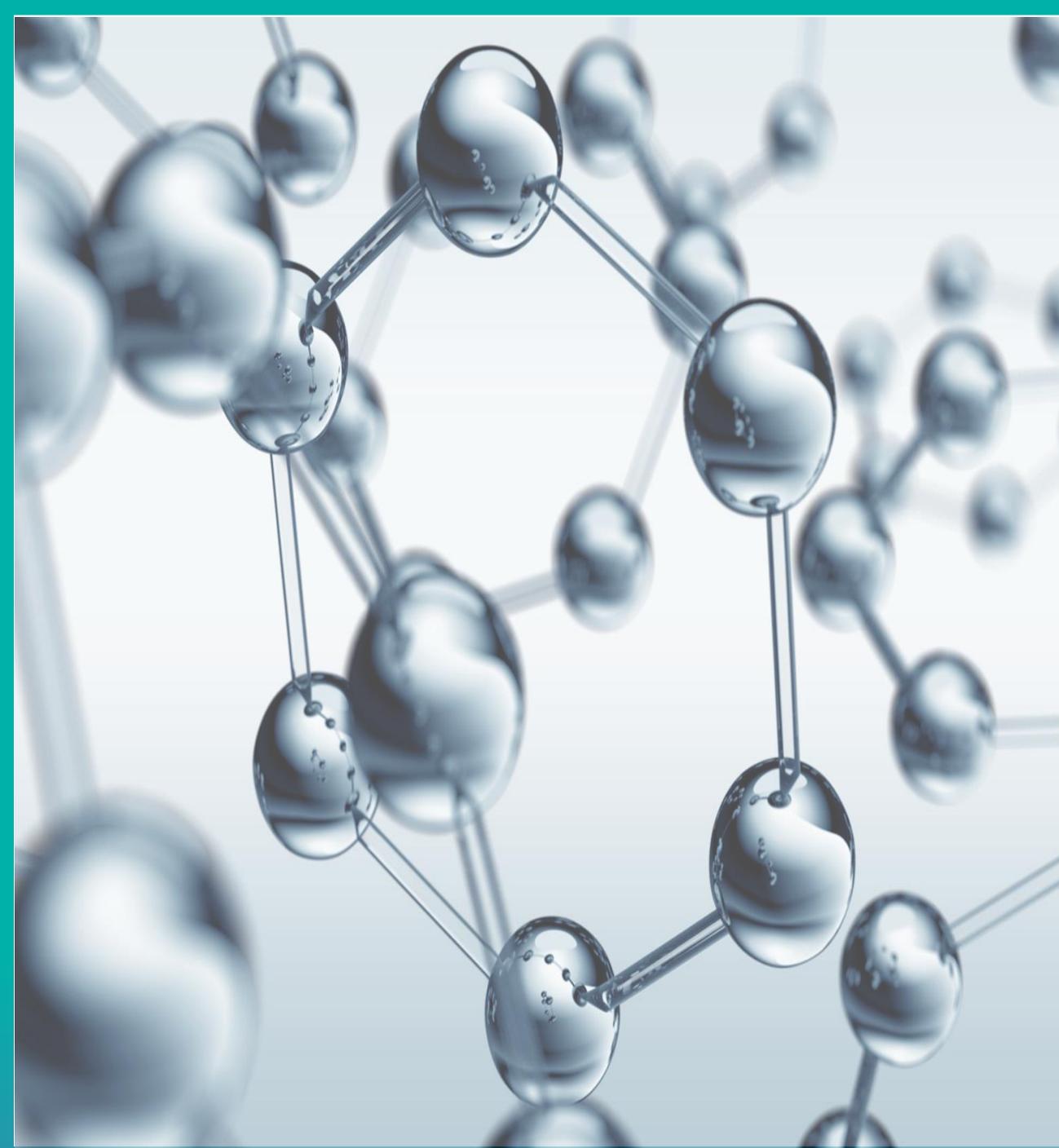


2023 Overview

- MTBE price was strong in 2023 on the back the mogas demand. The mogas crack spread vs dated Brent hit a new high at close to USD 30/bbl.
- Average MTBE-butane spread remained above USD 400/MT despite higher butane prices thanks to gasoline stronger demand
- MTBE faced challenges in the beginning of 2023 due to lower demand of oxygenates components amidst winter season.

2024 outlook – Stable

- Short supply is expected due to continued demand for gasoline, especially in Southeast Asia where the region is in supply deficit.
- Any increase in energy prices, particularly gasoline, will prompt rise in MTBE price.
- Stiff competition from other gasoline components especially in aromatics segment continues.
- Implementation of Electric Vehicle (EV) will pose a threat to MTBE as part of gasoline component.



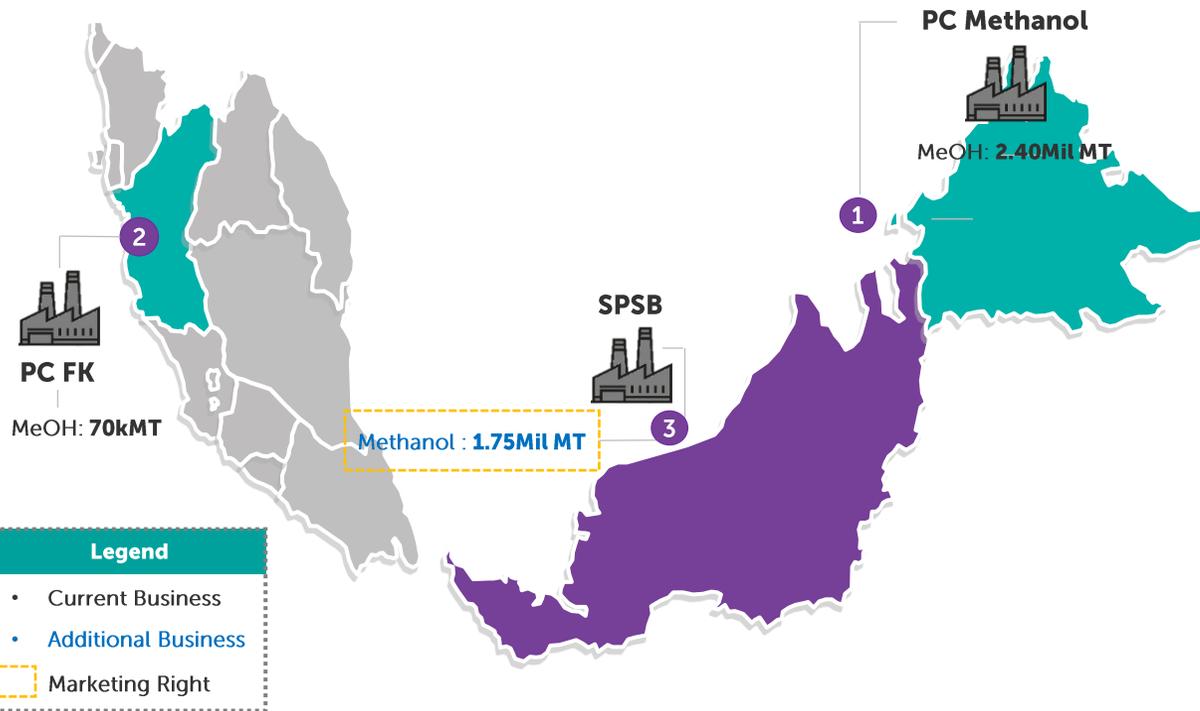
Fertilisers & Methanol

Methanol

M Nizam B M Yusof

Methanol Product Portfolio & Applications

Total Product Portfolio
4,174 KMTPA

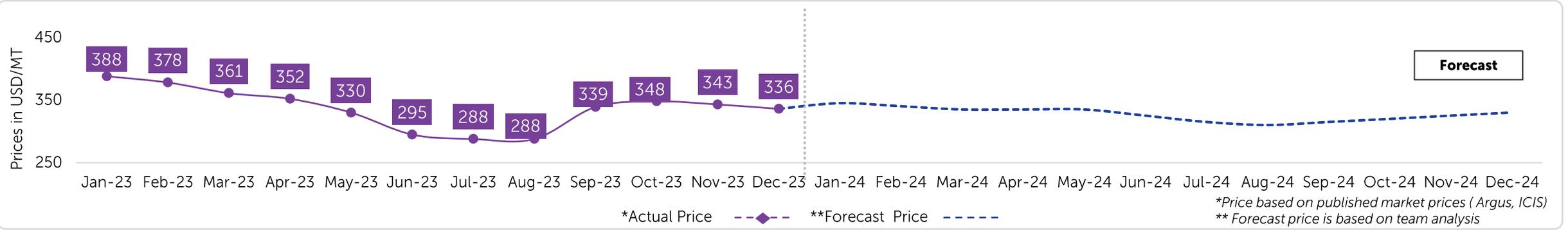


1	2	3
PC Methanol Labuan (PC Methanol)	PC Fertilizer Kedah Sdn. Bhd. (PCFKSB)	Sarawak Petchem Sdn. Bhd. (SPSB)
2,400 KMTPA ○ Methanol	70 KMTPA ○ Methanol	1,750 KMTPA ○ Methanol
Technology: Lurgi	Technology: Haldor Topsoe	Technology: Lurgi

Product Application

Formaldehyde	Acetic Acid	Feedstock Chemicals	Fuels

Methanol Outlook: Methanol is expected to be soft-to-stable amidst multiple new capacity additions and lackluster demand in GDP-linked traditional applications



2023 Overview

- Methanol started the year at USD 388/MT but declined to a low of USD 288/MT due to subdued market sentiments stemming from a constrained recovery amid slower economic growth and high inflationary environment.
- Downstream players were faced with thinning and squeezed margins from reduced purchasing power and higher feedstock costs – leading to production rationalization and declined methanol demand.
- However, multiple regional unplanned shutdowns and geopolitical factors were somewhat able to balance the overall market fundamentals, allowing an uplift to the prices in Q4 of the year.

2024 Outlook – Soft-to-Stable

- Supply is expected to be long in 2024, with multiple capacity additions globally i.e Southeast Asia, Middle-East and America
- Weaker derivative demand in traditional GDP-linked applications are still forecasted to linger throughout 2024.
- China’s decarbonisation policy and lackluster recovery post-pandemic era has signaled to not only Middle-Eastern but also American producers to rebalance their portfolio into Southeast Asia.
- Methanol-to-olefins (MTO) production in China is facing gradual rationalisation on poor olefin-derivatives economics and foreseeable decarbonisation of coal-based methanol.
- Potential upside from fuel applications such as biodiesel and emerging interests towards biofuels and low-carbon methanol as an alternative to marine bunker fuels is expected to gain traction in the long run.



Fertilisers & Methanol

Urea & Ammonia

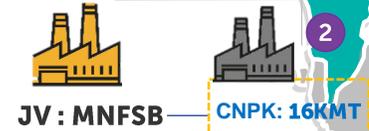
Azhar B M Radzi

Urea & Ammonia Product Portfolio & Applications

Total Product Portfolio
3,050 KMTPA

PETRONAS Chemicals Fertiliser Kedah Sdn. Bhd.
Gurun, Kedah est. 1999

696 KMTPA Granular Urea
400 KMTPA Ammonia (intermediate)
14 MLPA AdBlue
***60 KMTPA Melamine (2025)**



PETRONAS Chemicals Ammonia Sdn. Bhd.
Kerteh, Terengganu est. 1997

NH3: 450 KMTPA
CO Gas: 246 KMTPA

PETRONAS Chemicals Fertiliser Sabah Sdn. Bhd.
Sipitang, Sabah est 2016

Granular Urea: 1,200 KMTPA
NH3: 740 KMTPA (Intermediate)

ASEAN Bintulu Fertilizer (ABF) Sdn. Bhd.
Bintulu, Sarawak est. 1985

Granular Urea: 750 KMTPA
NH3: 450 KMTPA (Intermediate)

- Legend**
- Current Business
 - Additional Business
 - Marketing Right

Legend:
*KMTPA : Kilo Metric Tonnes Per Annum
*MLPA : Million Litres Per Annum
*MNFSB : Malaysian NPK Fertilizers Sdn. Bhd.

<p>1</p> <p>Asean Bintulu Fertilizers (ABF)</p> <p>KMTPA</p> <ul style="list-style-type: none"> Urea – 750 NH3 – 450 (Intermediate) <p>NH3 : UHDE</p> <p>Urea : Stamicarbon Granulation : UHDE</p>	<p>2</p> <p>PETRONAS Chemicals Fertilizer Kedah Sdn. Bhd. (PCFKSB)</p> <p>KMTPA</p> <ul style="list-style-type: none"> Urea – 696 NH3 – 400 (Intermediate) Adblue – 14mil Litre PA Melamine - 60 <p>NH3 : Haldor Topsoe</p> <p>Urea : Snamprogetti</p> <p>Melamine: Casale</p>	<p>3</p> <p>PETRONAS Chemicals Fertilizer Sabah Sdn. Bhd. (PCFSSB)</p> <p>KMTPA</p> <ul style="list-style-type: none"> Urea – 1,200 NH3 – 740 (Intermediate) <p>NH3 : Haldor Topsoe</p> <p>Urea : Snamprogetti Granulation : UHDE</p>	<p>4</p> <p>PETRONAS Chemicals Ammonia Sdn. Bhd. (PCASB)</p> <p>KMTPA</p> <ul style="list-style-type: none"> NH3 – 450 CO Gas - 246 <p>NH3 : Haldor Topsoe</p>
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Product Application

Urea	Ammonia	Melamine
<p>Agriculture</p> <ul style="list-style-type: none"> Straight Fertilizer NPK 	<p>Agriculture</p> <ul style="list-style-type: none"> Urea Phosphate (DAP/ MAP) Nitrate 	<ul style="list-style-type: none"> Floor Tiles Melamine Glue Dinnerware Dashboard/ Arm Rest Coating Kitchen Cabinet
<p>Industrial</p> <ul style="list-style-type: none"> Urea Formaldehyde Wastewater Treatment Melamine Animal Feed Diesel Exhaust Fluid 	<p>Industrial</p> <ul style="list-style-type: none"> Caprolactam Acrylonitrile Anti Corrosion 	

Urea Outlook: Stable prices in 2024 as market adapts to higher natural gas prices & uncertain China export policies



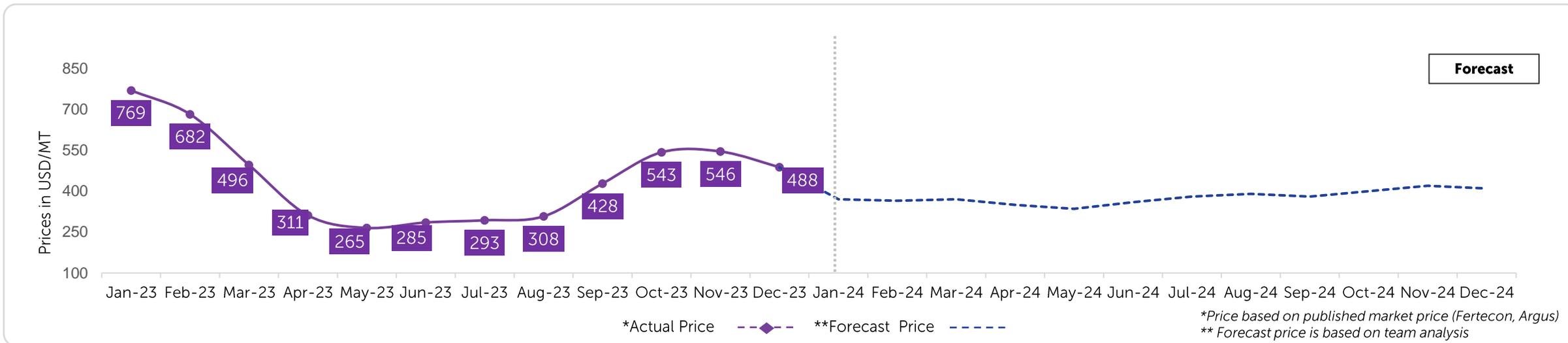
2023 Overview

- Urea prices averaged at USD356/MT in 2023, lower by 46% compared to USD663/MT in 2022 in line with declining natural gas prices by nearly 50%
- Supply and demand volatility driven by China's export restrictions, Indian tender requirement, adverse weather conditions and unprecedented drought.

2024 Outlook – Stable

- Price is anticipated to be stable amidst less volatile feedstock natural gas prices
- At the start of the year, India announced a tender which was originally expected in Dec 2023. This has stopped further price drop and will likely to provide support to urea prices in Q1.
- China is still expected to maintain strict export policy, as domestic producers focus on domestic application season during first half of 2024.
- Middle East remains a major global exporter to the West and East of Suez.
- India is potentially reducing its dependency on import volume with the start-up of new local capacities.
- Thailand demand remains steady, with expectations of 2-2.4 million MT yearly.

Ammonia Outlook :Prices in 2024 will be influenced by the APAC industrial downstream demand and new plant capacities



2023 Overview

- Ammonia prices averaged at USD447/MT in 2023, 51% lower compared to USD911/MT in 2022, in line with lower natural gas prices.
- Global downstream demand including Asia recovered slower than expected, especially with the slowdown in China’s economic growth.

2024 Outlook – Soft-to-Stable

- Soft-to-stable ammonia outlook as improved supply availability outweighs demand recovery.
- The recent Red Sea tension has elevated freight prices, resulting in higher prices for Middle East supply as compared to Southeast Asia.
- India is expected to import ammonia ahead of Kharif season to ensure stock availability.
- New capacities in US and Russia will limit price uptick.
- Downstream demand may remain sluggish with lower running rate of caprolactam and acrylonitrile in East of Suez.

Key takeaways

The chemicals market can expect gradual recovery in 2024 driven by improved economic growth, easing interest rates and resilient consumer spending. Nonetheless, supply availability continues to limit price uptick:

- **Ethylene** prices is anticipated to be soft with increased US export to Asia, new China capacities coming onstream amid weak downstream sector demand.
- **Monoethylene Glycol (MEG)** prices is forecast to be stable, supported by improved polyester demand alongside China's economic recovery.
- **Polyethylene (HDPE, LDPE, LLDPE)** will see recovery in 2H 2024, with improved demand for packaging and agriculture film, alongside China's anticipated recovery.
- **Paraxylene (Px)** will be supported by gasoline blending demand and stable Purified Terephthalic Acid (PTA), as new plants start up in China.
- **Methyl-Tertiary Butyl-Ether (MTBE)** will see support from gasoline demand movements.
- **Methanol** is anticipated to be soft with weak derivative demand as well as poor Methanol-to-Olefins (MTO) related demands.
- **Urea** is forecast to be stable as China maintains its export policy, while India continues to decrease reliance on exports.
- **Ammonia** is expected to move from stable to soft as supply availability outweighs demand recovery.



Thank you