

What drives China methanol price

Chemical Session, APIC 2024

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| A view of Argus

Headquartered in the UK, Argus has over 1,300 staff working in 29 offices in the world's principal commodity trading and production centres.

Argus publishes more than 42,000 daily and weekly spot and forward price assessments, along with commentary, news and analysis for global commodities and energy markets.

Coverage includes markets for:

- Oil, natural gas, power, hydrogen, coal, biomass, asphalt, base oils, emissions and carbon
- Biofuels
- Fertilizers
- Agriculture
- Chemicals, including petrochemicals and oleochemicals
- Metals, ferrous, non-ferrous, battery materials, and scrap

Services:

- Market reporting, news, and analysis
- Consulting and forecasting
- Conferences

Argus prices are used as benchmarks worldwide, including for:

- US crude oil
- European gasoline and biofuels
- Asia-Pacific LPG
- Coal
- European steel
- US and European environmental markets



Agenda - A journey exploring the key price drivers

A glance at the recent market trend

- *Address the key price drivers: feedstock, supply, inventories, MTO operations, ethylene prices*

Price outlooks:

- *Argus examines a myriad of potential cost/price drivers to forecast China spot methanol prices*

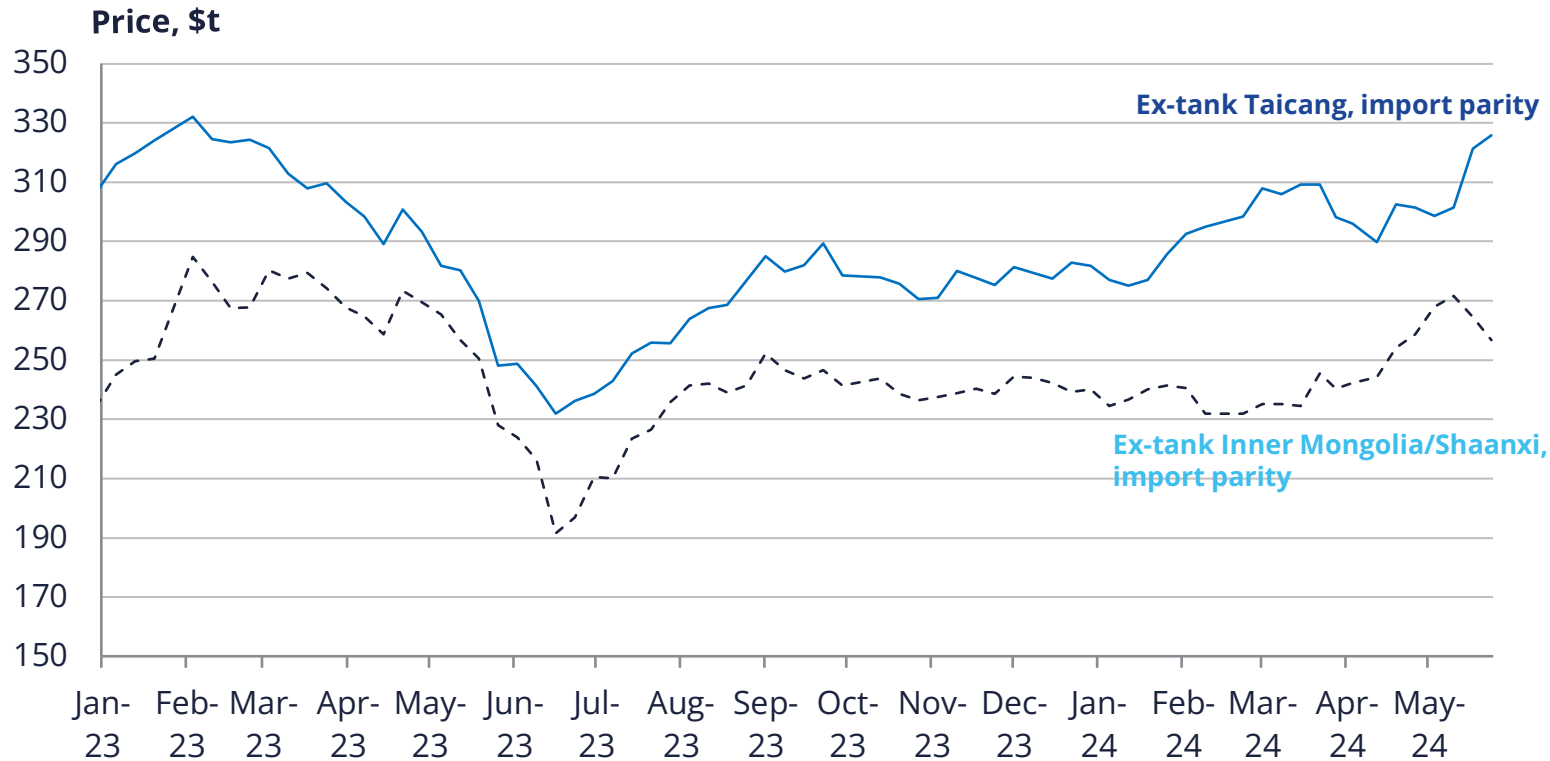
A closer look at demand

- *MTO, acetic acid, MTBE*
- *Emerging markets*
- *Methanol as fuels*

A glance at the recent market trend

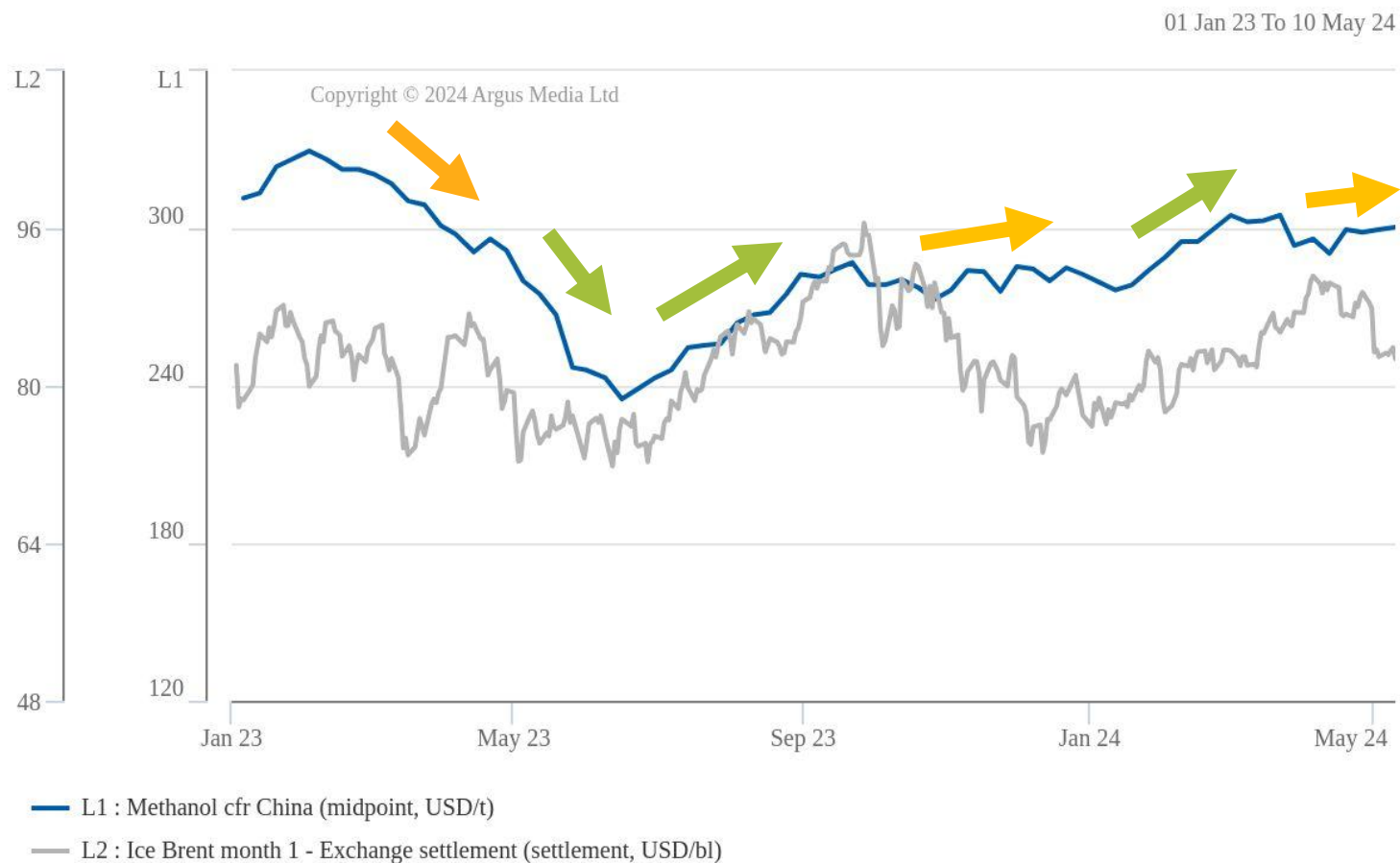
China's methanol prices at a yearly high

China's methanol price trend



- The major price drivers for China's methanol prices:
 - Feedstock (crude, coal)
 - Iran's supply availability, imports from elsewhere
 - China domestic production
 - MTO operations
 - Ethylene prices
 - Port inventories
 - Others (outages/expansions overseas, policy, macro, seasonality)

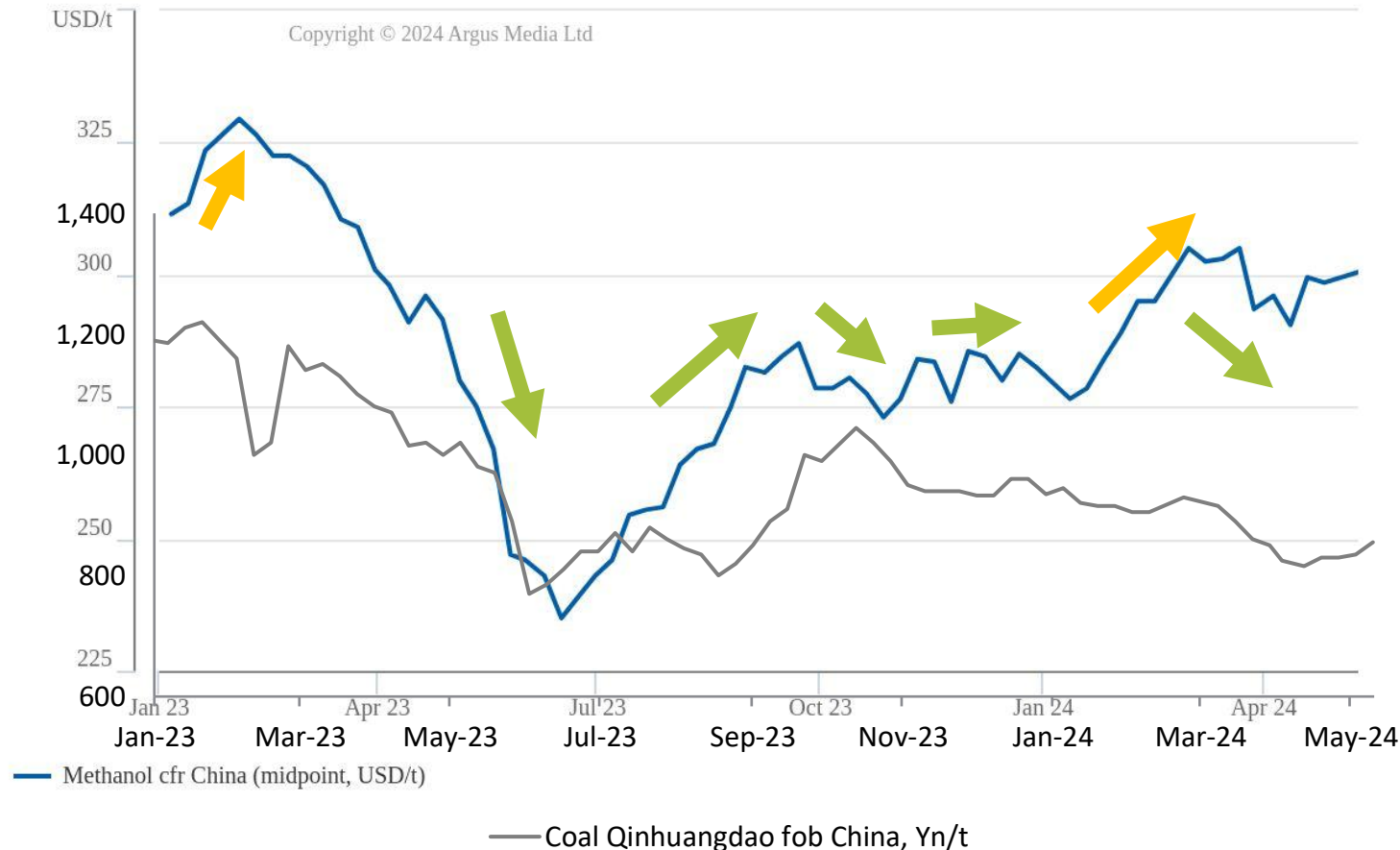
The key drivers for China methanol prices – Crude?



- Methanol (with part its nature as a fuel) usually tracks crude
- Puzzles arise:
 - Divided trend in 2H Mar 23
 - Divided trend in Q4 23
 - Divided trend in May 24

The key drivers for China methanol prices – Coal?

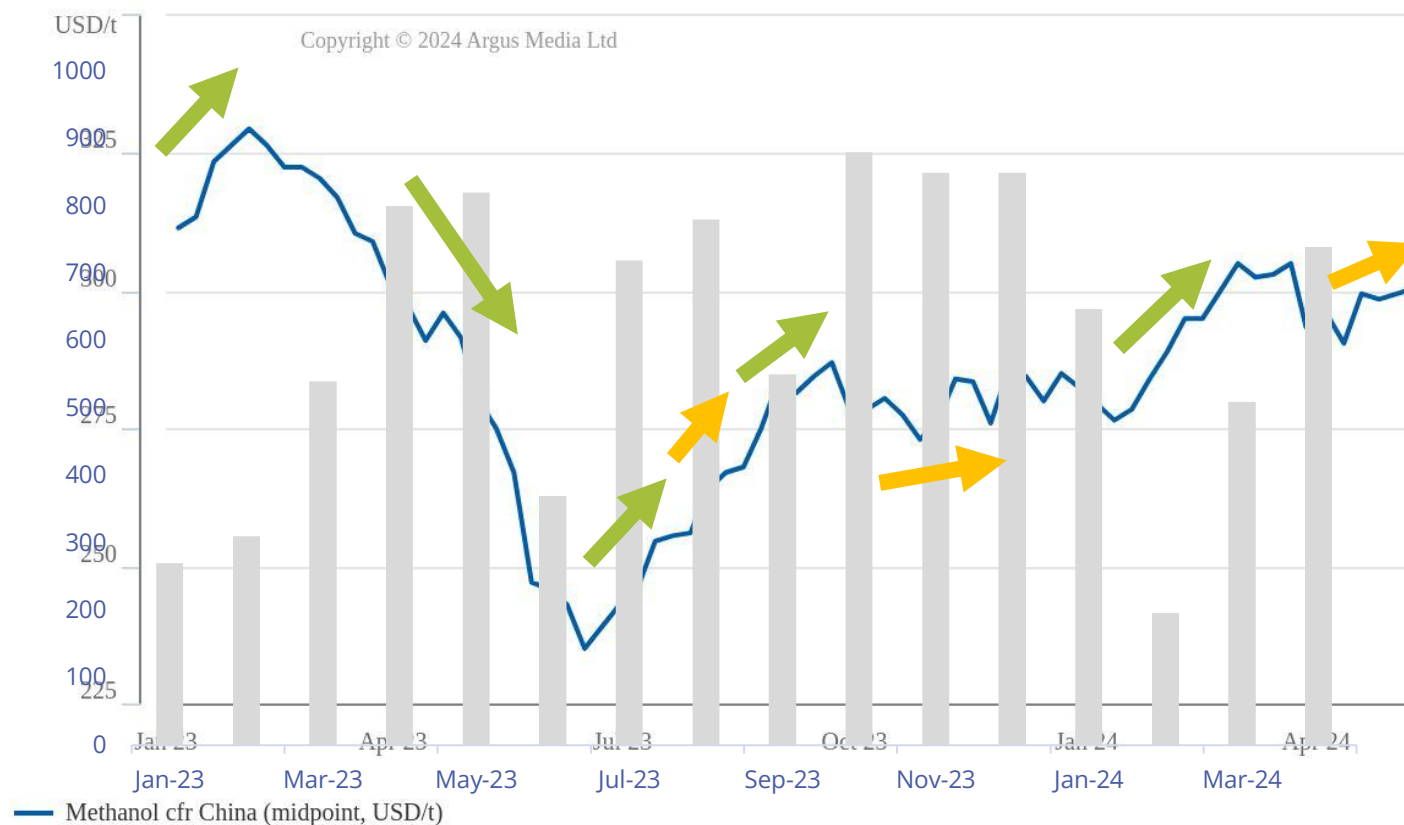
01 Jan 23 To 10 May 24



- About 65-70pc of China's methanol capacities are coal-based
- Puzzles arise:
 - Divided trend in Jan 23
 - Divided trend in Q1 24

The key drivers for China methanol prices – Iran’s supply availability?

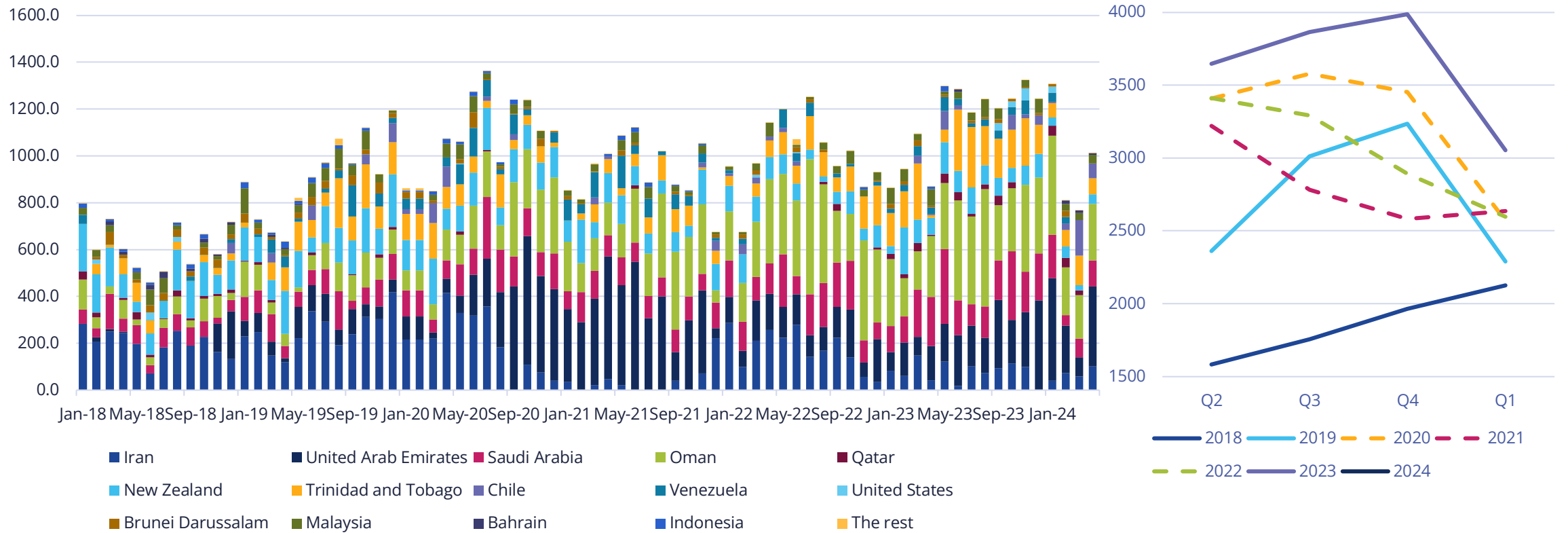
01 Jan 23 To 10 May 24



- About half of China’s methanol imports come from Iran:
- When supply increases, prices fall (after some lags)
- When supply decreases, prices rise (after some lags)
- Puzzles arise:
 - Divided trend in Aug 23
 - Divided trend in Q4 23
 - Divided trend in May 24

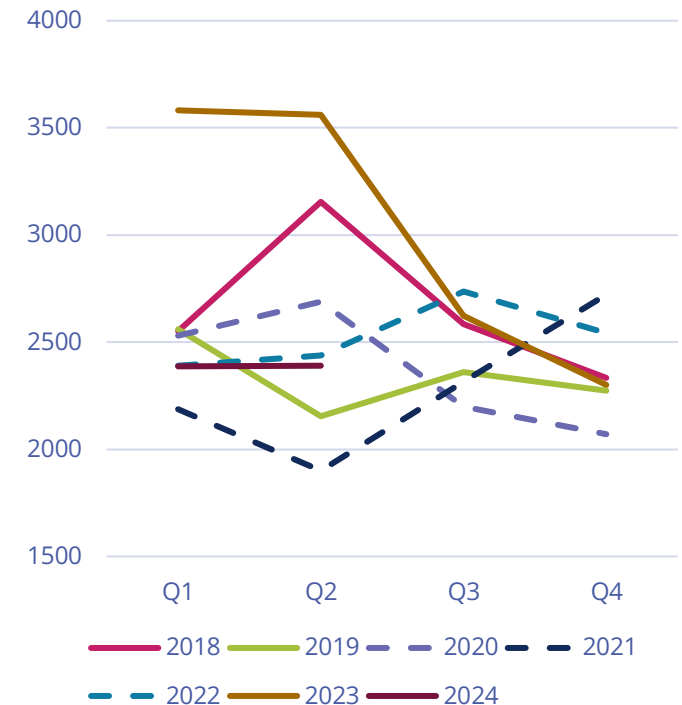
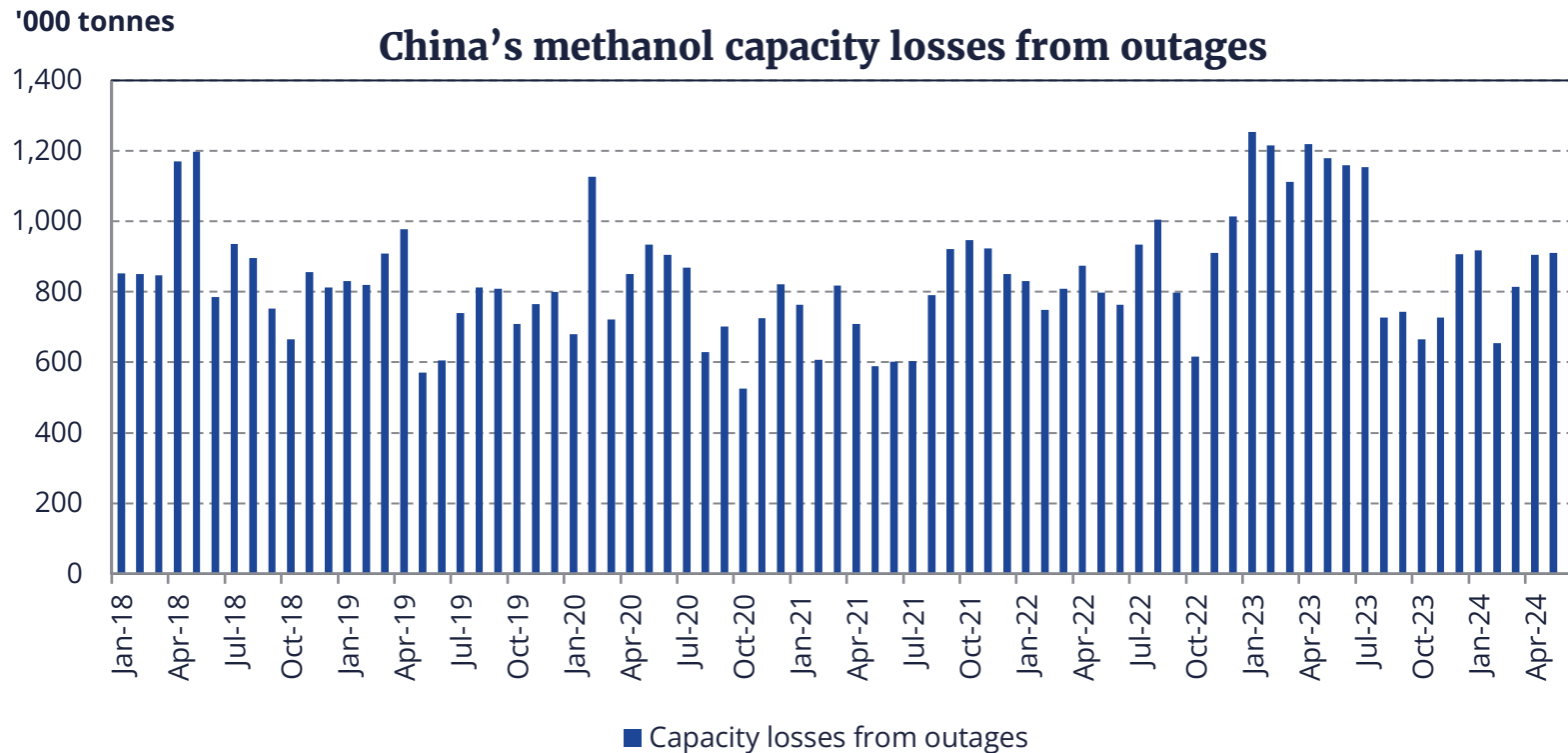
Will inventory builds remain slow in China – Other imports?

'000 tonnes **China methanol import volumes, by origin country and by month**



- China's methanol imports typically rise in Q2-Q3 and fall in Q4 because natural gas supply tightens in winter (prioritized for more heating uses).

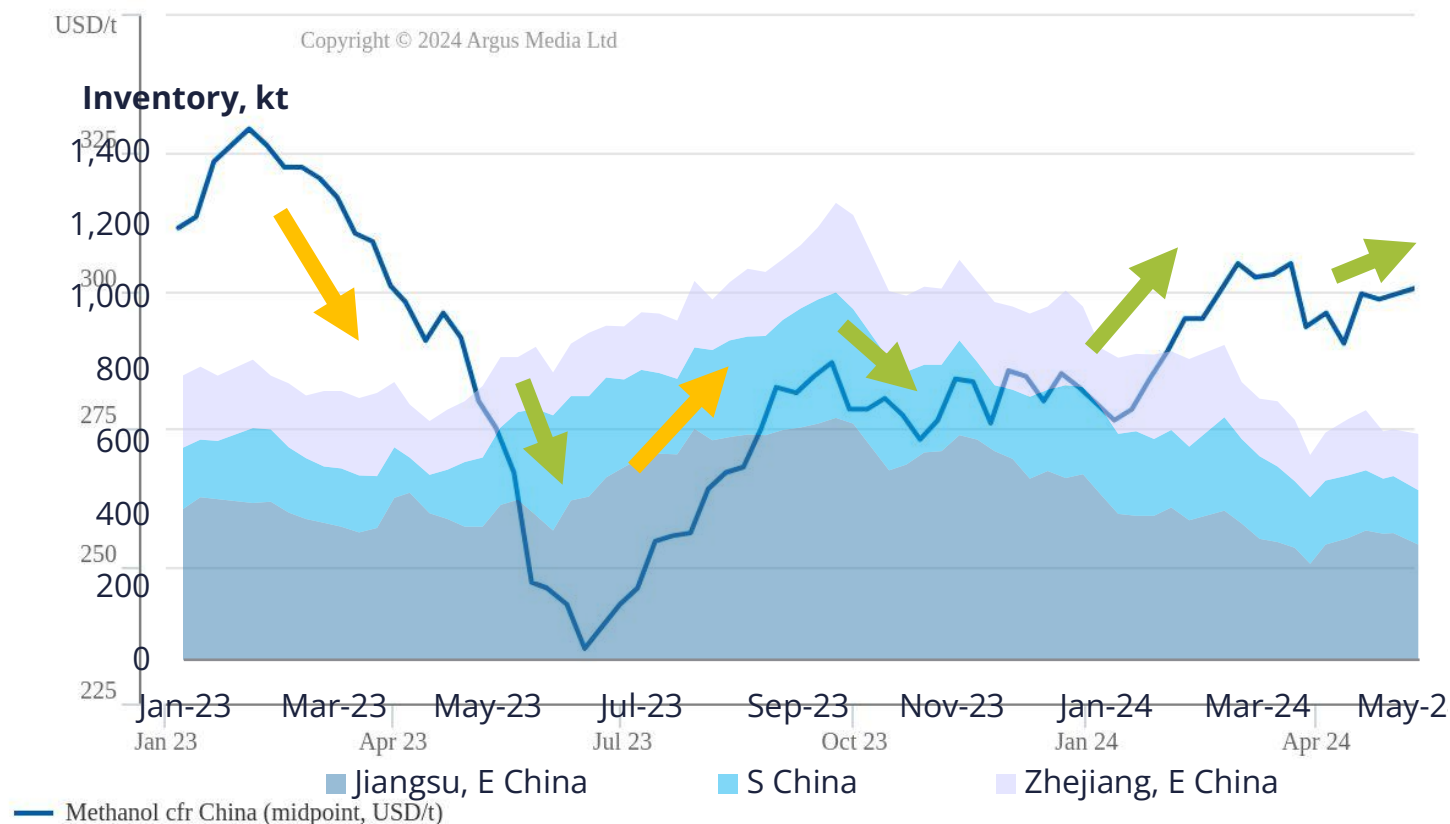
Will inventory builds remain slow in China – China production?



- China's coal-based methanol capacity losses typically increases in spring Q2 and decreases in winter Q4, which means Chinese plants usually produce less methanol in Q2 and more in Q4.

The key drivers for China methanol prices – Port inventories?

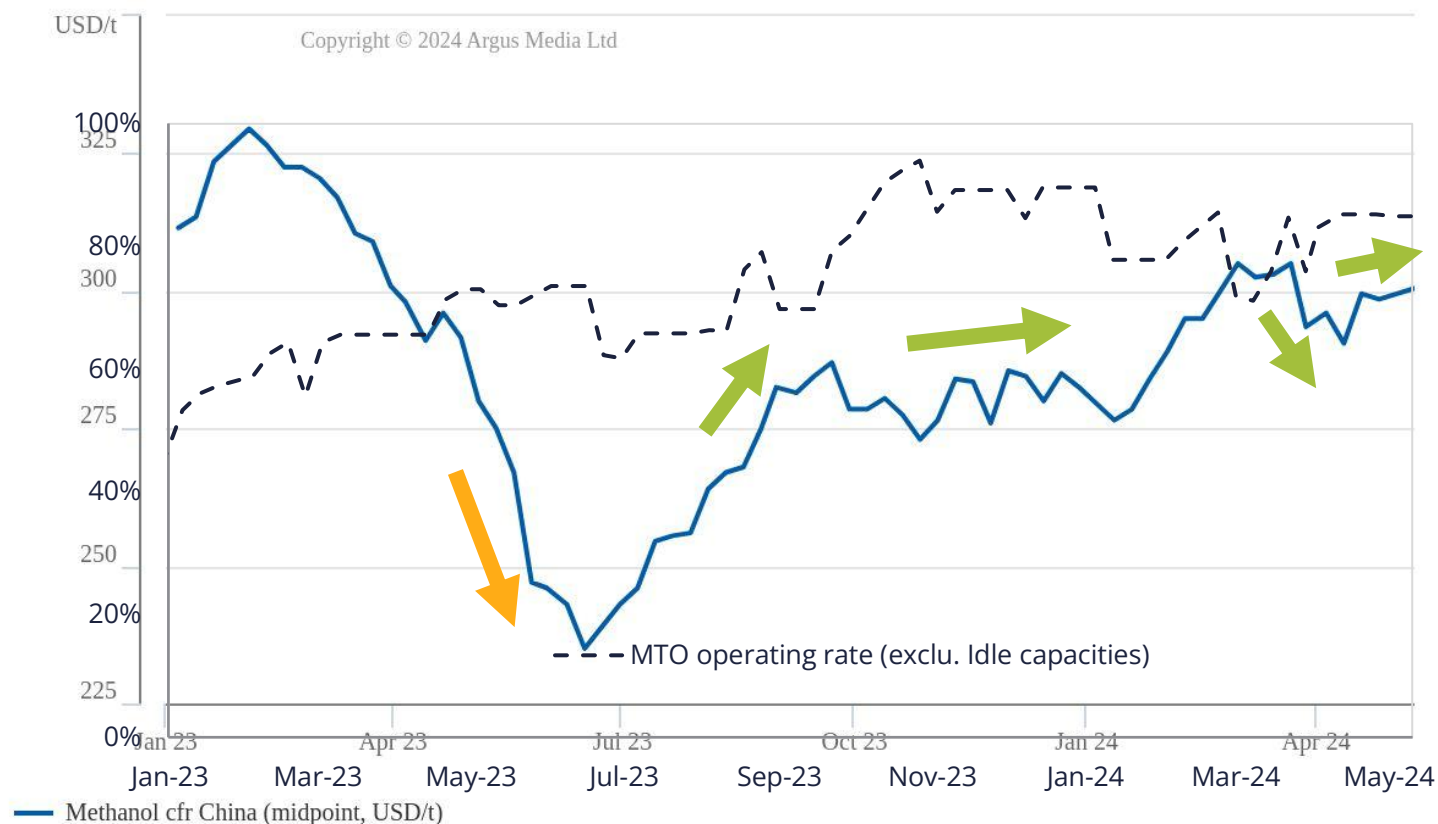
01 Jan 23 To 10 May 24



- Inventories affect market sentiment and impact methanol prices:
 - High inventories weigh down prices
 - Low inventories drive up prices
- Puzzles arise:
 - Divided trend in Feb-Apr 23
 - Divided trend in Jun-Sep 23

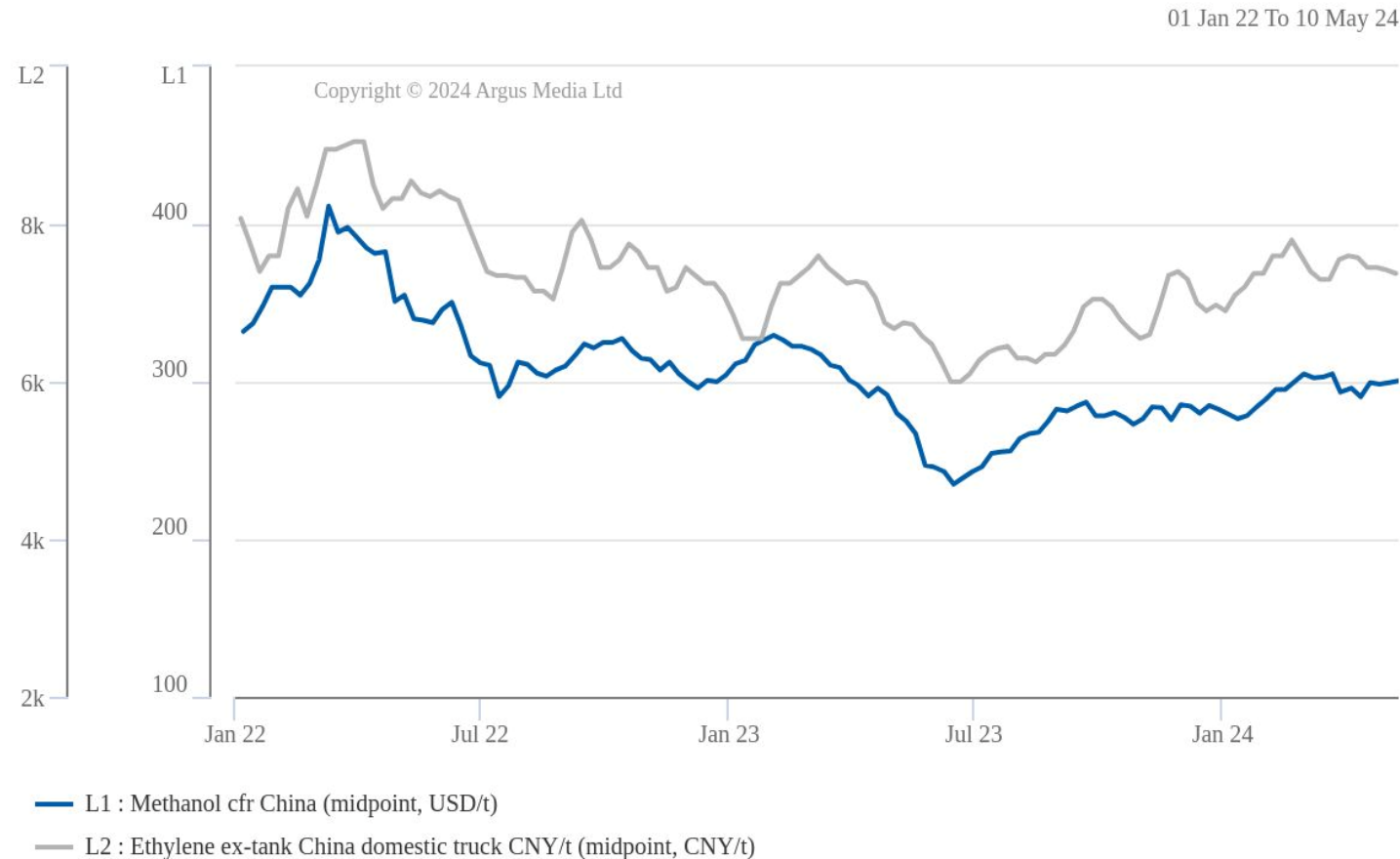
The key drivers for China methanol prices – MTO operations?

01 Jan 23 To 10 May 24



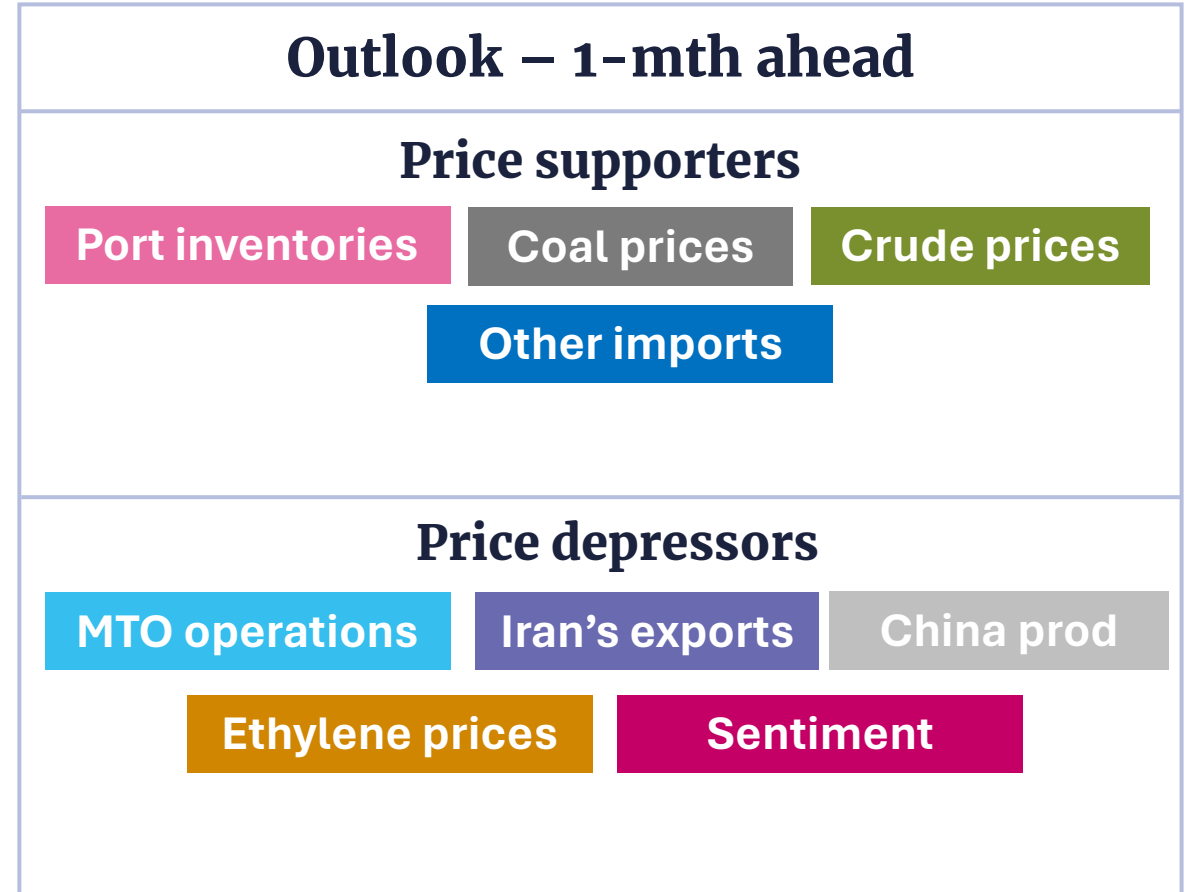
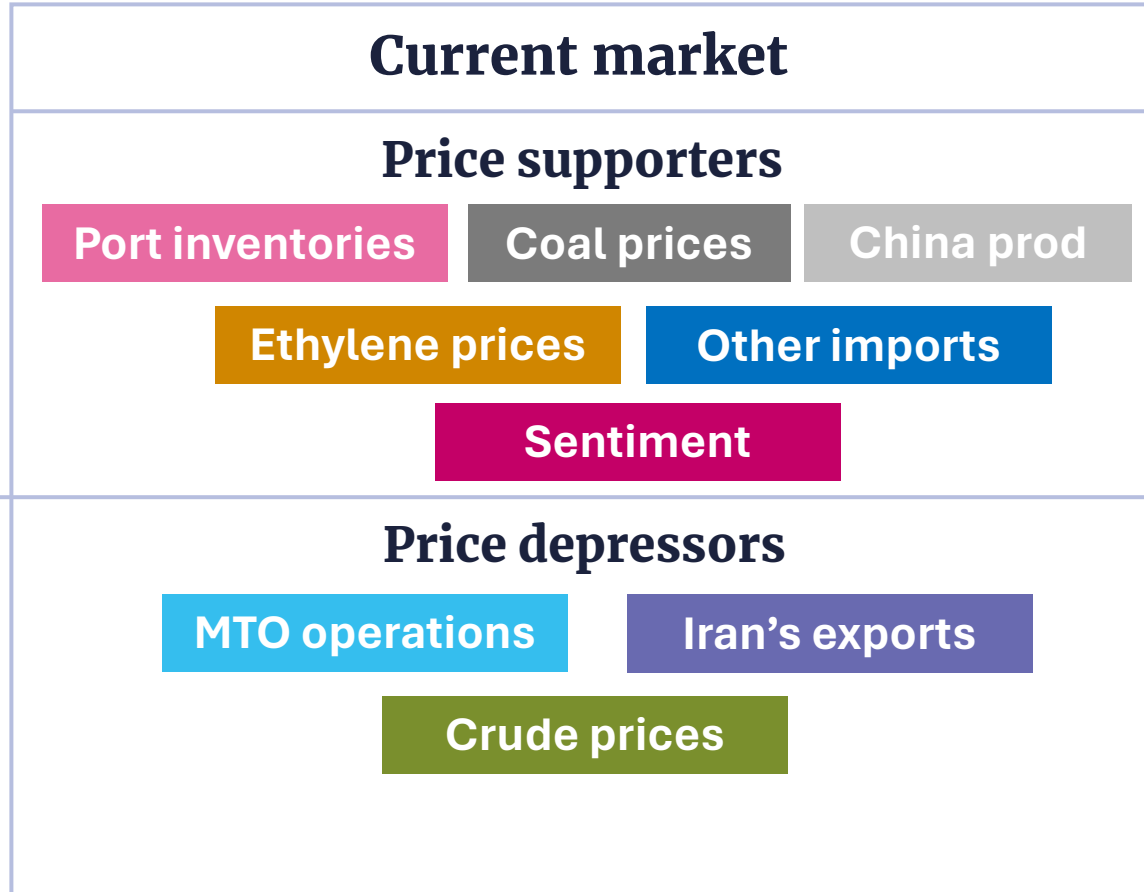
- MTO is the largest methanol downstream sector and consumes half of China's imports
- Higher MTO operations support methanol prices
- Lower MTO operations weigh down prices
- Puzzles arise:
 - Divided trend in May-Jun 23

The key drivers for China methanol prices – Ethylene prices!



- The correlation between methanol and ethylene prices reached 90% in Jan22-May24
- The logic behind methanol and ethylene:
 - MTO bridges methanol and olefin. Lower ethylene weakens MTO's affordability to methanol, vice versa
- And Argus believes MTO methanol affordability has been and will continue to be the dominate "price setter" in China, and the base for the world

Takeaways from the 1st step (24 May 2024)



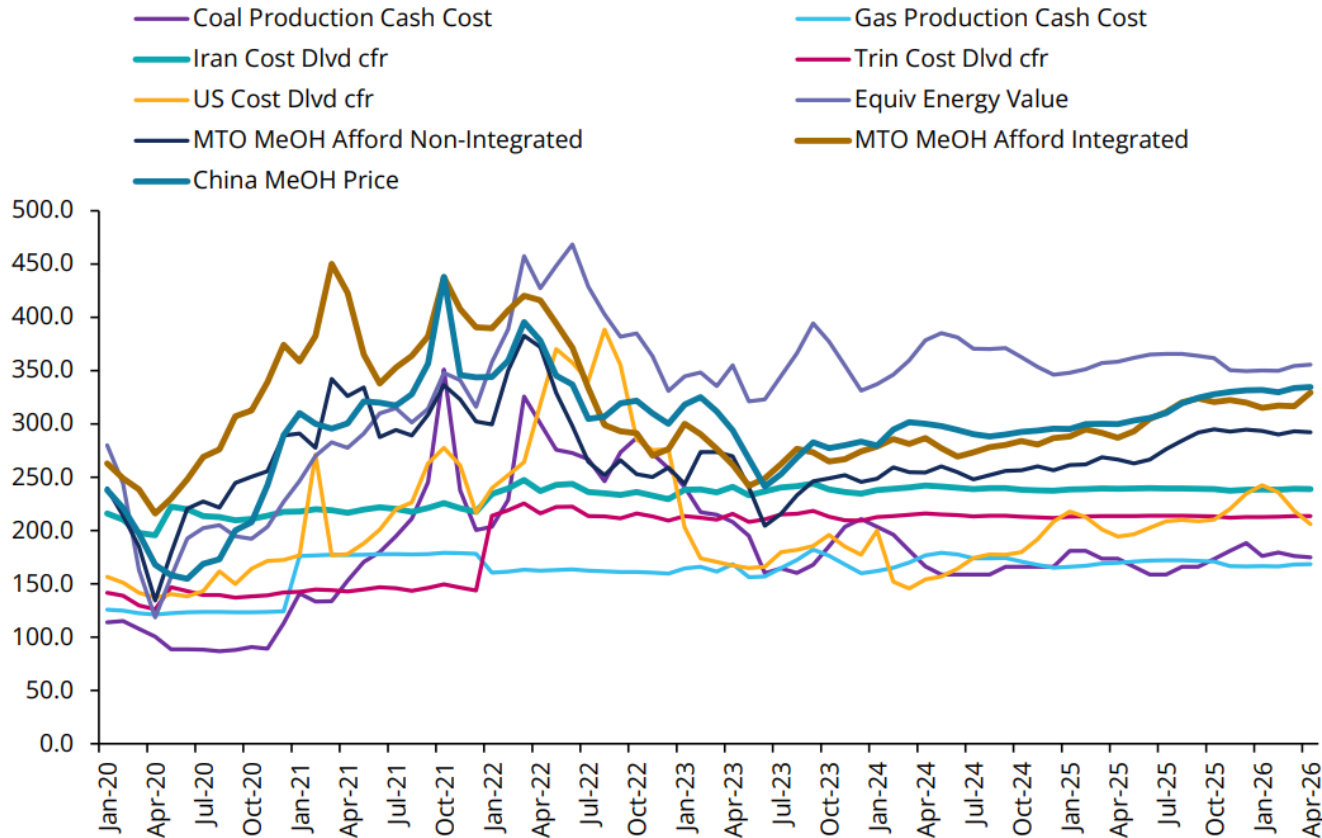
Price outlooks

Asia-Pacific - China

Argus examines a myriad of potential cost/price drivers to ultimately forecast China spot methanol prices.

China methanol price driver analysis

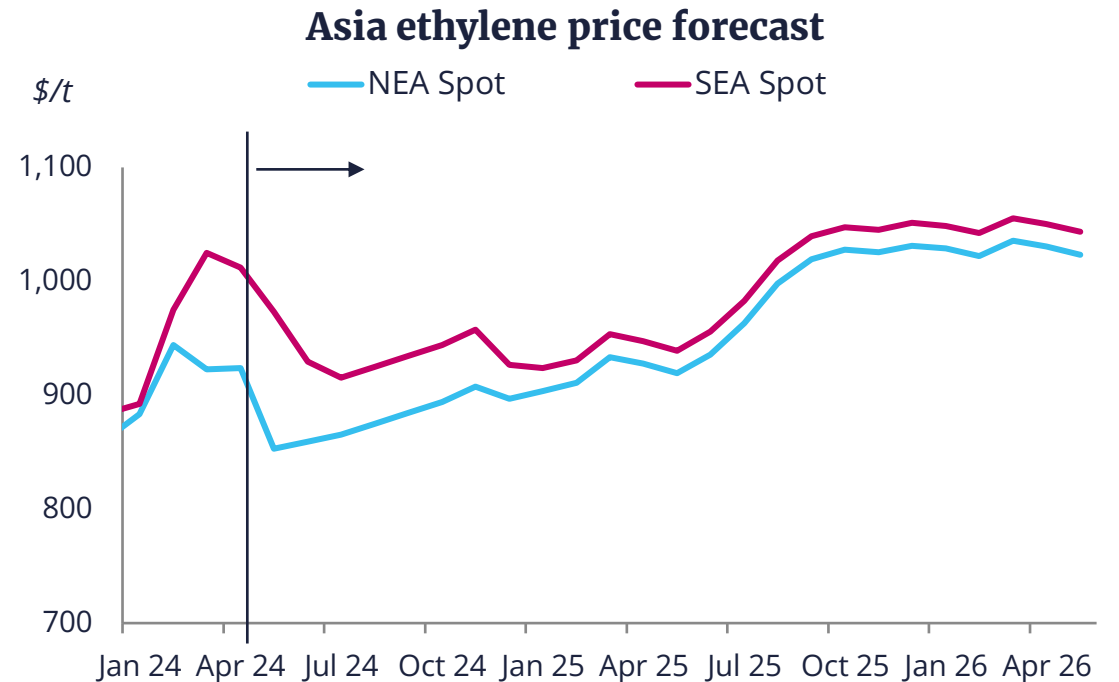
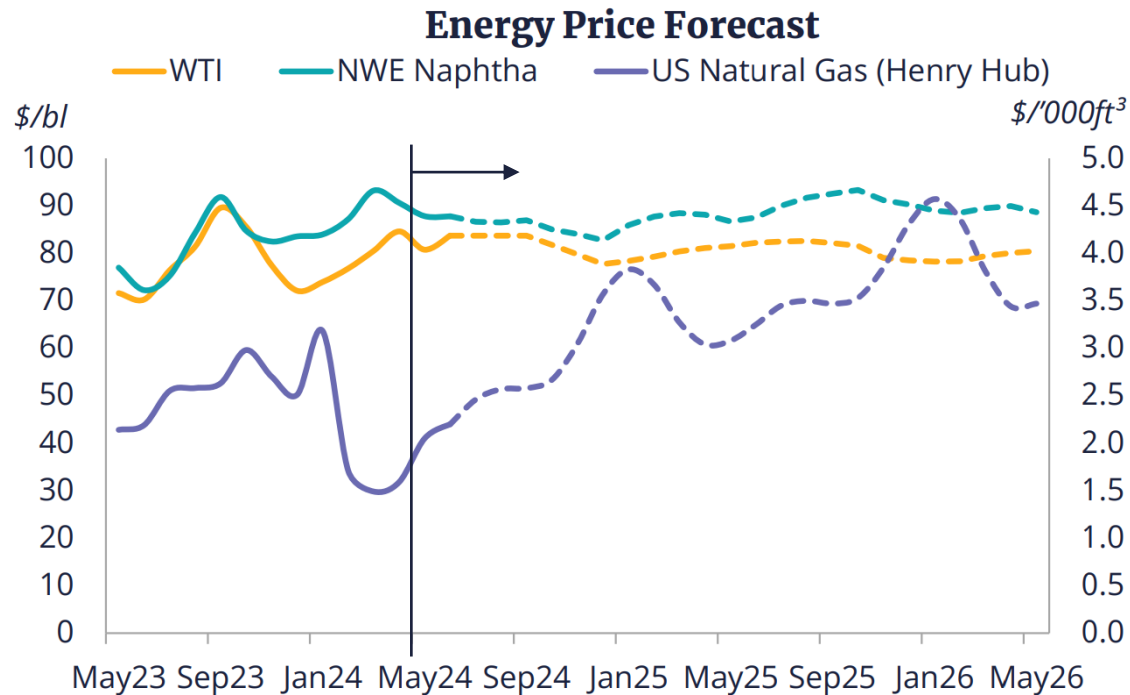
- \$/t



- With China methanol supply and demand as much as 50pc of world total and serves as the clearing house for world excess supply, China is deemed the price setter for the world. To determine the spot methanol price for China, Argus first considers the following potential drivers:

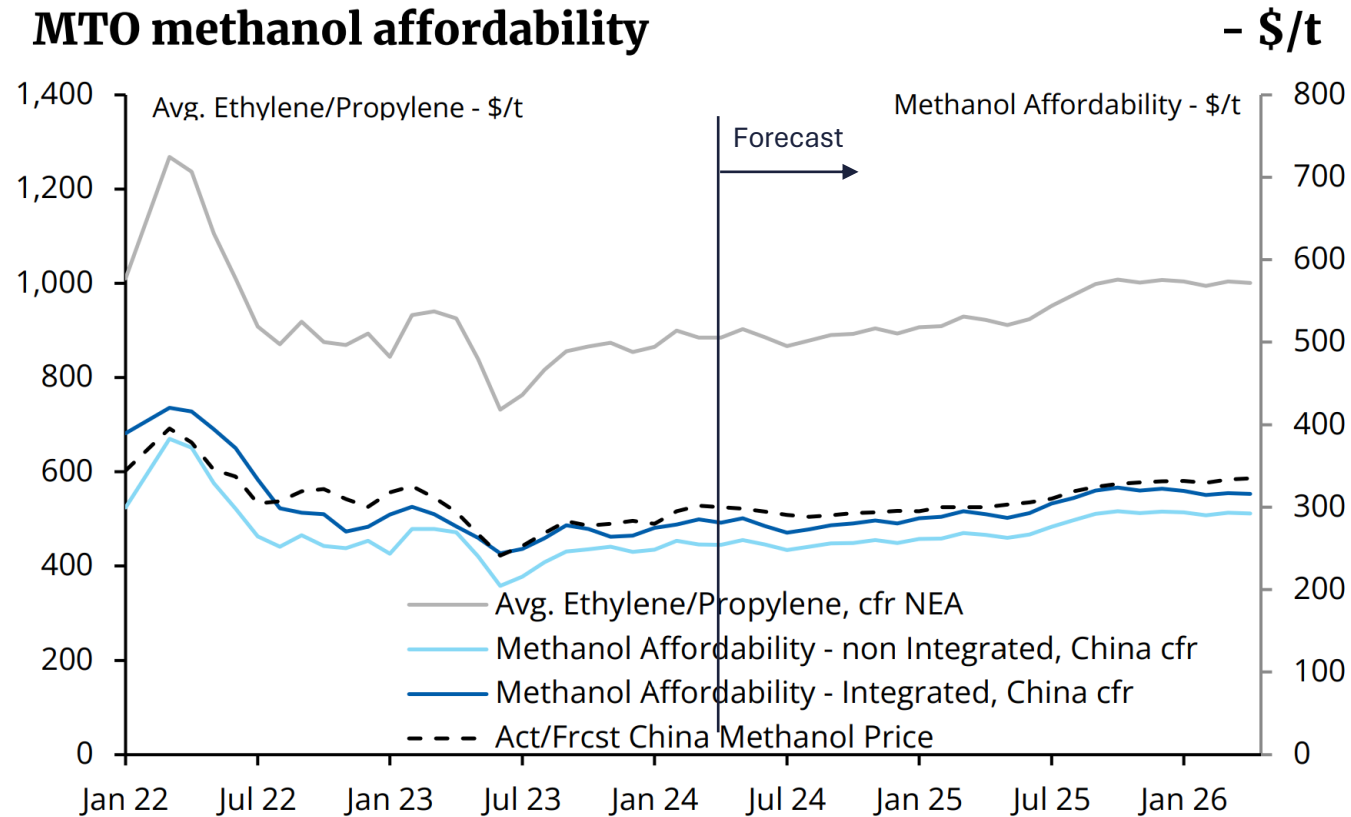
- Cash cost of US methanol production, fob US Gulf.
- Cash cost of Trinidad methanol production delivered, fob US Gulf.
- China methanol price and delta.
- Europe methanol price.
- Alternate Middle East netback, US versus EU.
- Alternate Trinidad netback, US versus EU.
- Alternate ME netback, US versus EU.
- Of course, there can be others.
- While there can occasionally be exceptions, Argus believes MTO methanol affordability has been and will continue to be the dominate “price setter” in the China market. This serves as the base for the world, with rest of world prices set in relations to China.

Will China methanol continue its uptrend – Feedstock and Ethylene



Argus expects methanol prices to soften in near term, but firm in a longer run

MTO methanol affordability

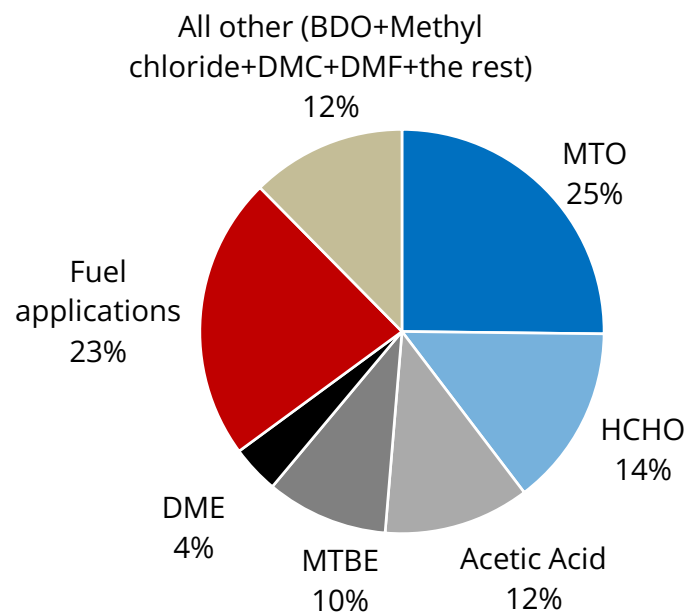


- Higher methanol prices and stalling olefin prices from 2H April erased MTO margins. MTOs started production cuts from mid-May, but duration remains unpredictable.
- Argus still expects upward trending olefin/derivative values to driver higher China methanol prices through 2024-25 – but this may further delay.
- Methanol prod continues to see puts-and-takes. Iran prod is improving, but still sees blips. Planned/unplanned outages in the US, SEA and Q2 planned outage in Europe are keeping supply snug. Gerismar 3 startup is now pushed to late Q3. Sarawak aims for Q3 startup

A closer look at demand

Methanol consumption structure in China changes with time

China methanol demand (less CTO), 2023

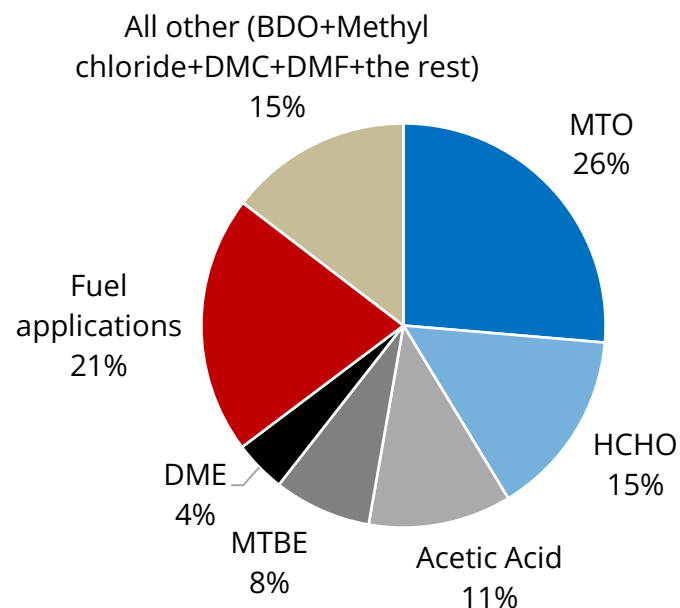


Year 2023

Total demand (less CTO) = 50.3mn t

-Argus Consulting Services

China methanol demand (less CTO), 2028



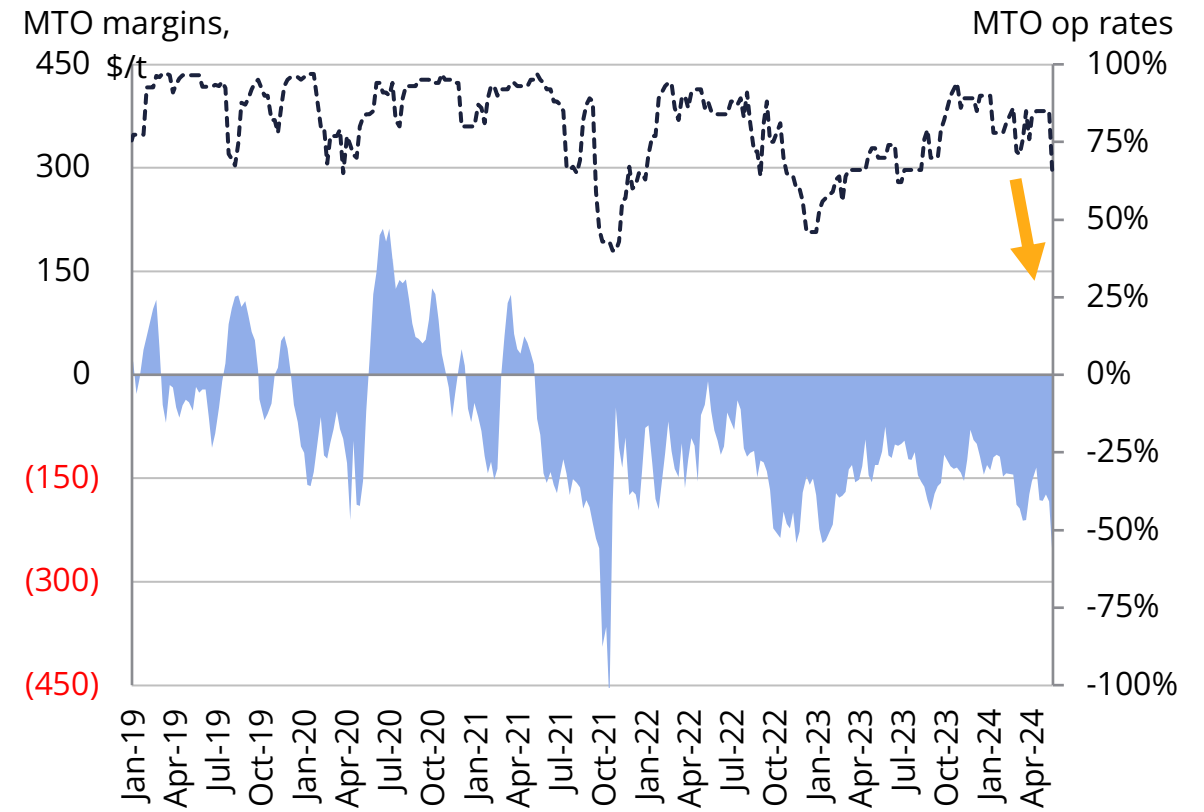
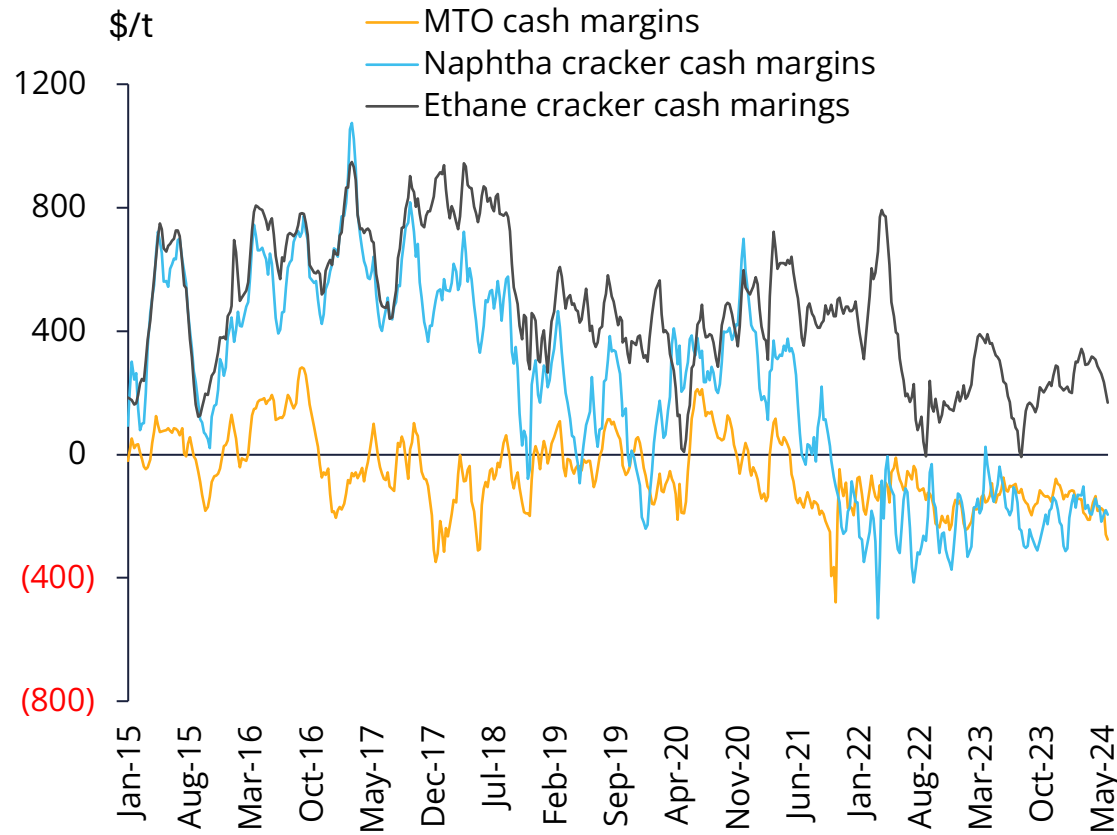
Year 2028

Total demand (less CTO) = 60.8mn t

-Argus Consulting Services

	2018-23	2023-28
MTO	4.3%	4.6%
HCHO	3.9%	4.3%
Acetic Acid	3.2%	3.2%
MTBE	2.7%	-0.9%
DME	-12.9%	5.3%
Fuel applic:	1.0%	1.7%
All other (B	8.9%	7.1%
Total	2.6%	3.6%

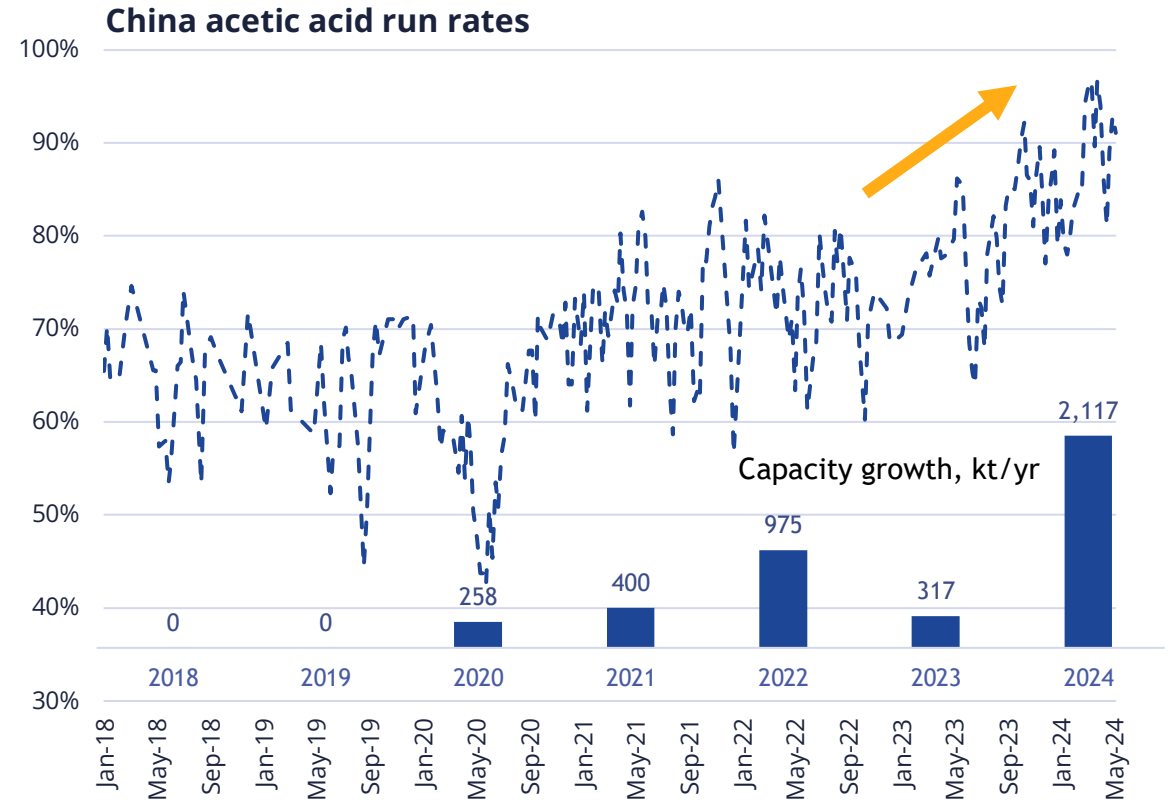
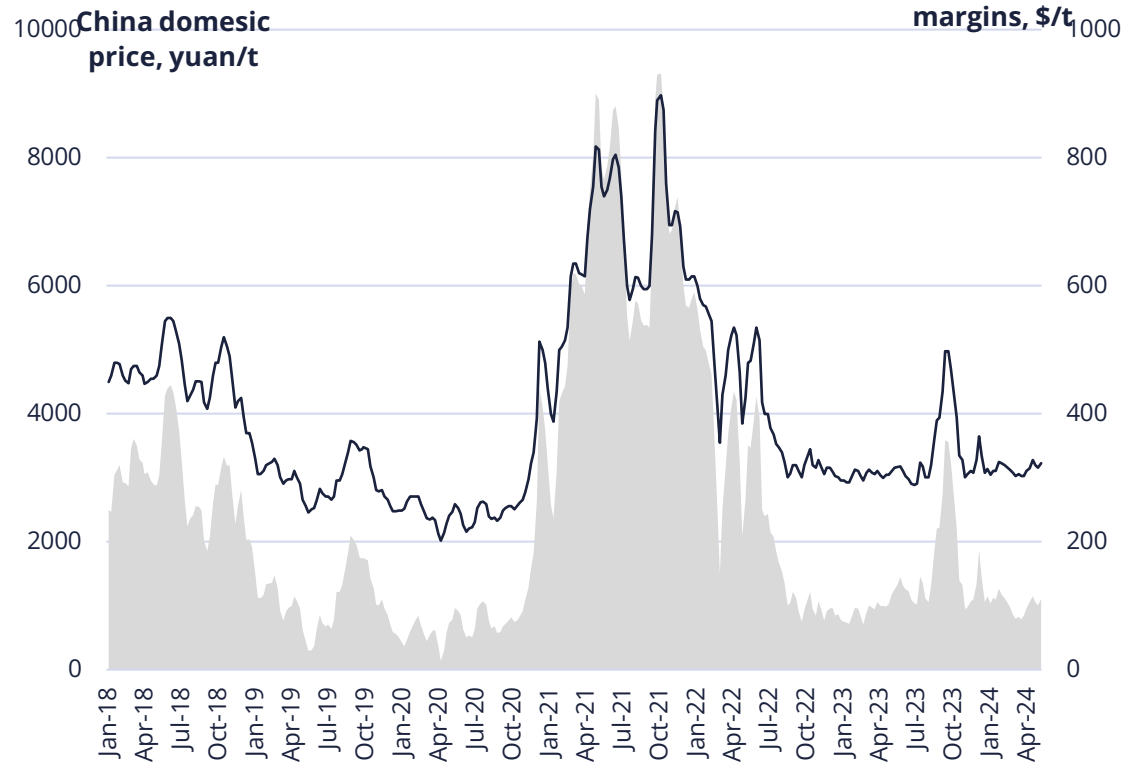
Is MTO that is providing strong support to demand – The sustainability of MTO operations



| Demand from MTO to continue to grow with new projects ahead

Company, Location	MTO Capacity, kta	Required Methanol, kta	Existing Methanol Balance, kta	Additional Demand, kta	Project Status	Startup
Guangxi Huayi, S China	1,000	2,800	1,800 methanol, 1,200 acetic acid = 1,100 excess methanol	1,700	Construction began in end-2022	End-2025
Shandong Lianhong, N China	460	1,300	920 methanol, 460 MTO = 320 methanol net short	1,620	Signed off EPC contract in Feb 2024	End-2025

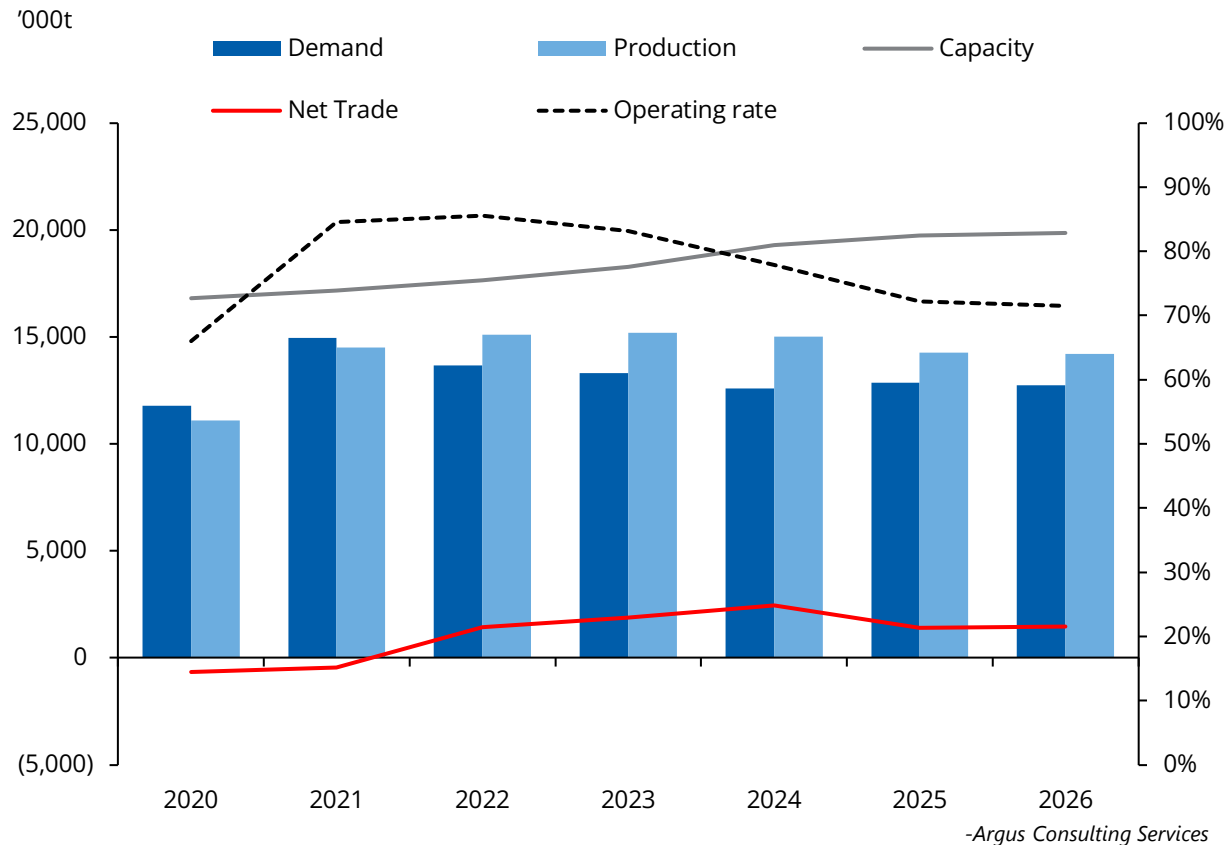
What else drives methanol demand – Acetic acid



- China's acetic acid capacity reached 10.7mn t/yr in 2023 and will grow rapidly by 2.1mn in 2024 and another 2.4mn in 2025.
- Huge expansions in its downstream PTA (~11mn additions) and VAM (700kta additions) sectors in 2023, supported demand

| What else drives methanol demand – MTBE

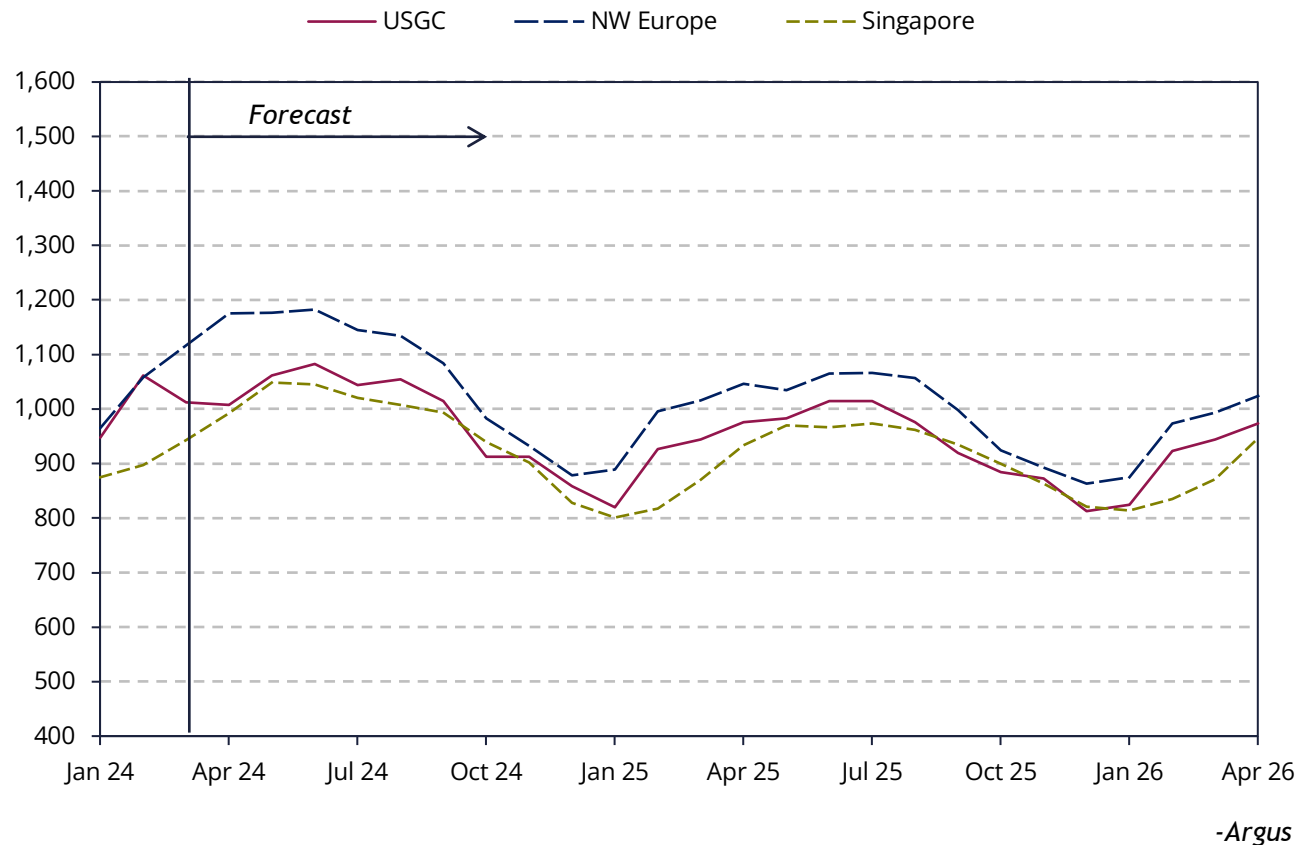
China MTBE supply and demand balance



- China's MTBE run rates stay high ~83-86pc in 2021-23, but may fall to ~78pc in 2024
- MTBE capacity/production continues to grow with mega cracker/ref/PDH projects
- Capacity (effective) reached 18.3mn t/yr by end-23, up by 9pc from 2020. 2024 will see another 1mn addition to 19.3mn
- Production rose to 15.2mn t in 2023, up sharply by 37pc from 11.1mn t in 2020
- While China domestic consumption declined since 2021, exports surged
- Net trade increased from -700kt in 2020 to 1.9mn t in 2023 and may rise further to 2.4mn t in 2024

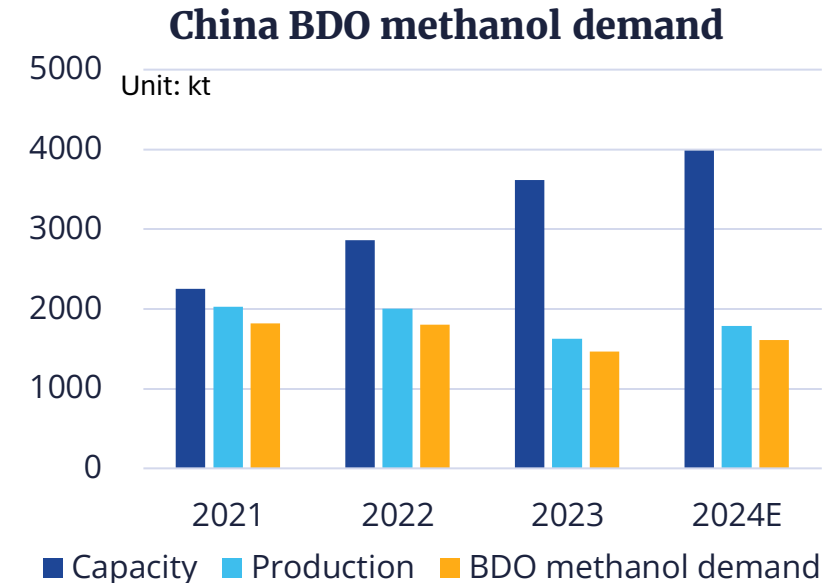
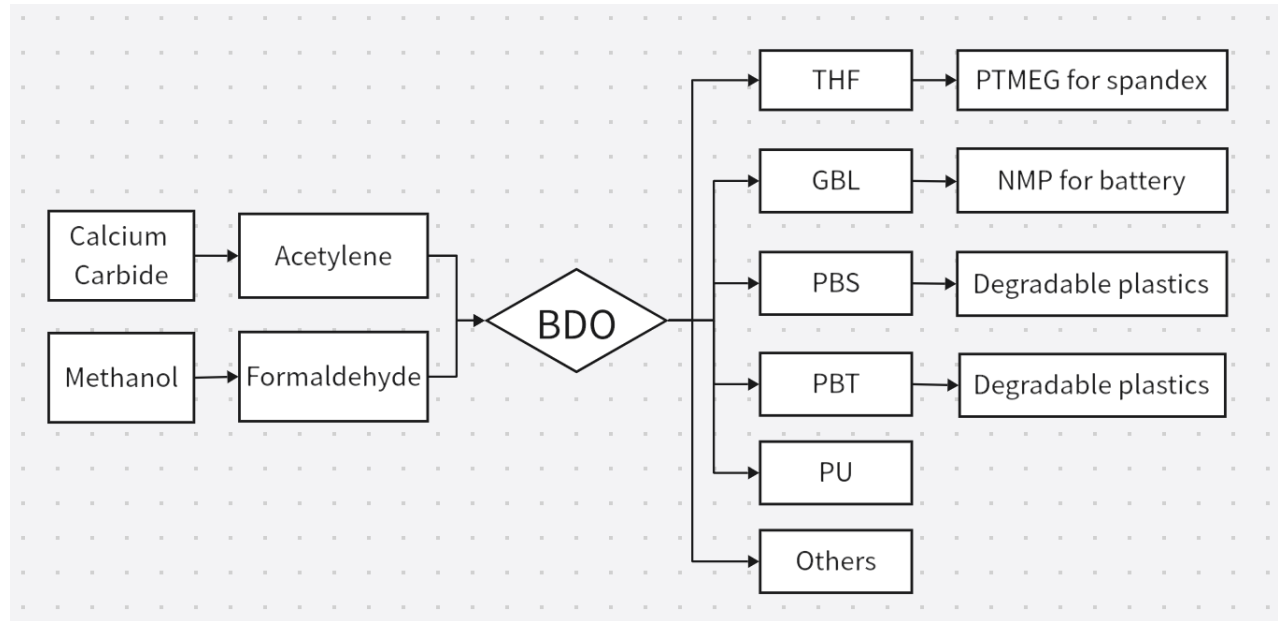
What else drives methanol demand – MTBE

Global MTBE price forecast, \$/t



- Demand is stronger with upcoming driving season likely to continue to the end of Q2
- China's MTBE supply decreased in April due to plant turnarounds, but most plants will resume operations by mid-May
- China will continue to be large exporter due to increased electric cars and gasoline export quotas, but possible consumption tax could change the outcome
- Exports will continue to support China prices. Cargoes were even sold directly to Europe, however, the window may close soon due to additional voyage times via Red Sea.

Demand prospects in formaldehyde-BDO-degradable plastics



- China's formaldehyde industry in the stage of rationalization since late last decade; Traditional plywood demand depressed by declining property market; New formaldehyde capacities in the recent years mostly integrated with downstream BDO
- BDO is used in making degradable plastics, lithium battery, spandex, PU, medical intermediates
- Driven by stimulus policy in degradable plastics and new energy cars, China's BDO investment heated in 2020-21. But with huge expansions and declining margins, investment slowed again.

| Demand prospects in fuels – M100 growth remains slow

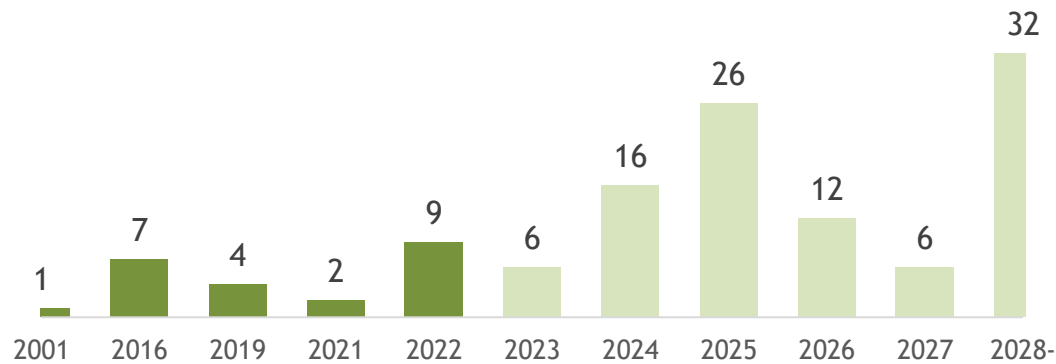


- A total of 26,724 M100-fuelled taxis are under service, requiring methanol about 400kta. But growth prospects are limited.
- Policy milestone, China 1 Sep 2023 implemented the national standards of methanol fuel for vehicles "M100 methanol fuel for vehicles" and "M100 methanol fuel additive for vehicles"
- Led by Geely, China is boosting M100 heavy load trucks
- Assuming an annual growth of 2,000 M100 trucks, demand growth for methanol is likely about 200kta.

Demand prospects in fuels – as marine fuel

Process	CO2 emissions		
	Well-to-tank	Tank-to-wake	Full-life-cycle
E-Methanol	-1.335	1.375	0.040
Bio-Methanol	-1.234	1.375	0.141
Coal-based	2.500	1.375	3.875
Natural gas-based	0.535	1.375	1.910

Methanol ship deliveries



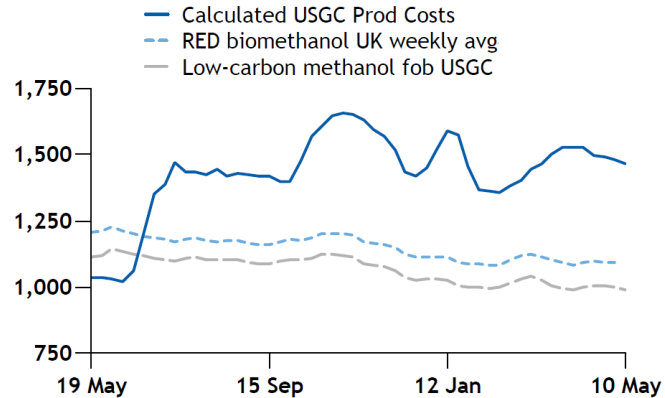
- Regulation driven - Emissions Trading Scheme, FuelEU Maritime Regulation, IMO
- The successful use of methanol as a marine fuel relies on competitive cost, secured volumes, policy support and recognized certificates
- Main challenges:
 - Bio-methanol: biomass supply/storage/transport, scale of size, production continuity
 - E-methanol (green & blue): high cost in obtaining green hydrogen, DAC technology, location, and certificates for blue

Argus bio- and low carbon methanol price assessments

LOW-CARBON METHANOL

Low-carbon methanol pricing

\$/t



Argus Media launched pricing instruments for the US low-carbon methanol sector this week.

Argus assessed US low-carbon methanol at \$990.7/metric tonne (t) fob USGC, down by \$10.05/t from last week amid softening global markets.

European bio-methanol prices slipped \$11/t to \$1,080/t this week. The price had been as high as \$1,100/t on April 17.

The calculated cost of USGC low-carbon methanol production stood at \$1,464.7/t, down by \$16.55/t from last week.

Low-carbon methanol			\$/t
	Timing	Price	±
RED biomethanol cif UK	Prompt	1,091.00	-2.00
RED biomethanol ARA diff to fob Rotterdam methanol index	Prompt	+721.95	-8.68
Low-carbon methanol fob USGC	Prompt	990.70	-10.05
Low-carbon methanol diff to methanol Houston barge	Prompt	+669.50	-5.40
Low-carbon methanol US calculation	Prompt	1,464.70	-16.55
Low-carbon methanol fob USGC diff to low-carbon methanol calculation	Prompt	-480.50	+8.37

Weaker RINs cost offset higher natural gas prices this week.

Low-carbon methanol is attracting widespread attention from multiple industrial sectors because it offers a decarbonization route both for the chemical industry's traditional end-uses and for reducing the sulphur content and carbon footprint of shipping, where it can be used as a bunker fuel.

For more information about this new pricing service, please contact US methanol senior reporter Steven McGinn at Steven.McGinn@argusmedia.com.

- Friday (10 May) Argus launched six low-carbon methanol assessments for the methanol weekly service
- US low-carbon methanol fob USGC – a brand-new assessment on methanol produced from a variety of processes (biogas, carbon capture, combination of the two, e-methanol).
- RED biomethanol cif UK Weekly average – a waste-gas biomethanol assessment, first launched in Biofuels
- Methanol US low-carbon production cost calculation – showing production cost associated with use of low-carbon feedstocks at a conventional methanol production site

| Argus bio- and low carbon methanol database

Global e-Methanol production facilities

Global e-Methanol production facilities

Published 02 May 24 |  [Download file](#)

Biomethanol refinery database

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Argus Marine Fuels - price calculator tool_May 1, 2024

Argus Marine Fuels - price calculator tool_May 1, 2024

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Argus Media_Alternative Fuels Vessels and Suppliers Database

Argus Media_Alternative Fuels Vessels and Suppliers Database

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Conclusion

Conclusion

- The key price drivers for China's methanol price include feedstock (crude, coal), supply (imports, domestic production), demand (mainly MTO affordability), port inventories, etc. Ethylene price (setting MTO affordability) is identified to have the highest correlation with China methanol price, while sentiment acts as an erratic card.
- The near-term price outlook is downward, but medium-to-longer term price forecast is upward, driven by crude, ethylene, MTO demand, as well as emerging demand.
- Methanol demand growth sees mainly from MTO, acetic acid, emerging sectors (BDO, DMC, methyl chloride etc.) and marine fuel (mainly to low carbon methanol).
- Demand for low carbon methanol, especially green and blue, may pick up from 2025 when both production facilities and methanol-fueled vessels are due to be delivered
- Argus launched the USGC low carbon methanol assessment on 10 May 2024, after assessing RED biomethanol cif UK since 2021

Thank you

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