

## China Oil &amp; Gas

## Weekly Theme: oil &amp; gas and refined oil consumptions in FY23; Jan GRM improved

Industry Overview

## FY23 oil &amp; gas demand boosted YoY on recovery

According to NBS and China Customs data, in Dec, China crude oil apparent demand was 15.5mbd/65.9mnt, +2% YoY/+7% MoM, with the throughput at 14.2mbd/60.1mnt, +0.4% YoY/-2% MoM. The monthly domestic output was 4.2mbd/17.6mnt, +5% YoY/-1% MoM and the import volume was 11.4mbd/48.4mnt, +1% YoY/+10% MoM. In FY23, oil apparent demand totaled 15.4mbd/771.9mnt, +9% YoY, mainly fueled by demand growth from refined oil products, chemical feedstocks and fuel oil, which was up by 17/37/7% YoY in 2023 vs. 3/11/9% in 2022 resp; On the supply front, domestic production booked 4.2mbd/209.1mnt (+2% YoY) and import volume was 11.3mbd/564.3mnt (+11% YoY).

In Dec23, China natural gas apparent demand was 37bcm, +10% YoY/+9% MoM. On the supply front, domestic production and import contributed 21bcm (+3% YoY/+5% MoM) 17bcm (+23% YoY/+16% MoM) resp. In FY23, China gas demand recorded 388bcm, +8% YoY, driven by city gas demand and manufacturing. Domestic output registered at 231bcm (+6% YoY) and import volume was 164bcm (+9% YoY) of which LNG/PNG imports comprised 98/66bcm, +13% YoY/+6% YoY respectively. The annual gas import price came in at US\$11/mmbtu, -16% YoY, in line with a 17% YoY drop in Brent oil price.

## Strong growths of refined oil demand and exports in FY23

According to NBS and China Customs data, China's apparent demand of refined products (typically include gasoline, diesel, and jet fuel) grew by 16% YoY in FY23. By products, the demand growth of gasoline, diesel and kerosene vs. FY22 was 12/13/73%, respectively. Demand of gasoline, diesel and kerosene account for 53/38/9% of total consumption. We attributed this to improved demand from transportation and domestic flights, of which, China international flights were still weak compared with 2019 level. Kerosene consumption was -12% vs. 2019. Meanwhile, China totally exported 42mnt of refined oil products (including gasoline, diesel, and jet fuel) in FY23, up by 22% YoY, driven by export quota and rising demand in overseas market. We believe China will raise export volume in 1Q24 given 1) 19mnt of new export quota; 2) current lukewarm demand in China; and 3) profitable arbitrage spread for exports.

## Export spread squeezed by notable rise in domestic GRM

According to our tracked data, export arbitrage spreads of both diesel and gasoline between Singapore and China have both narrowed MoM in Jan24. The month-to-date spread for diesel shrank from positive US\$13.8/b in Dec23 to positive US\$9.3/b in Jan24 and that for gasoline squeezed from positive US\$10.2/b in Dec23 to positive US\$6.8/b in Jan24. Meanwhile, we observe China's GRM (gross refining margin, one-month crude price lag) has evidently improved from Dec's deep depression of negative US\$0.3/b to positive US\$4.8/b, given 1) oil price slightly gained 1% MoM, which could potentially contribute to inventory gains; 2) recovered prices for byproducts (including fuel oil, LPG, asphalt, sulfur, etc).

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Abbreviations in appendix

More charts in following pages

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## Weekly updates

Oil prices: Brent oil price increased 0.3% WoW to US\$78.6/b and WTI oil price increased 1.0% WoW to US\$73.4/b in the week ended 19 Jan 2024. WTI discount to Brent narrowed to US\$5.2/b.

Factors supporting oil prices include:

- *Bloomberg* reports that North Dakota's oil production has halved due to freezing temperature with about 650-700kbd of output taken offline;
- *Reuters* reports that OPEC forecasted global oil demand growth will be relatively strong at 2.25mbd in 2024 and robust at 1.85mbd in 2025, mainly led by China and the Middle East;
- *Reuters* reports that the IEA raised its 2024 demand growth forecast by 130kbd to 1.1mbd despite a cut of 90kbd for that in 2023;
- *Reuters* reports tensions grew at the Red Sea since the US launched new strikes against Houthi anti-ship missiles, raising concerns over potential supply issues;
- The US commercial crude oil inventory decreased 2mb WoW to 430mb through the week ended 12 Jan 2024.

Factors suppressing oil prices include:

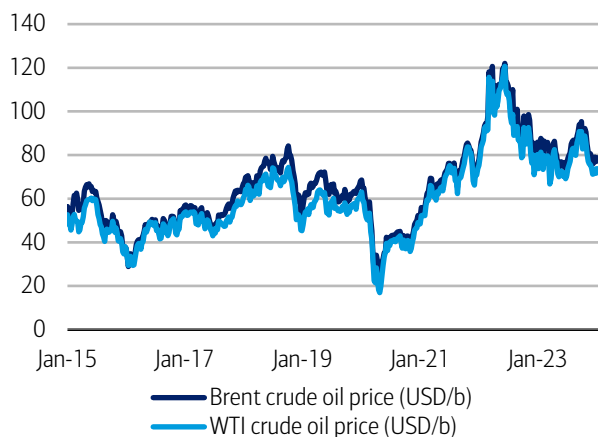
- The US rigs count rose to 617 rigs (oil rigs -2 WoW to 497 and gas rigs +3 WoW to 120) through the week ended 19 Jan 2024;
- The US crude output (one-week lag) increased 0.1mbd WoW to 13.3mbd through the week ended 12 Jan 2024.

*Reuters* reports that Sinopec and BP signed a memorandum of understanding (MOU) to strengthen cooperations in fuel sales, oil & gas trading, bunker fuel sales and lubricants, and upstream activities, whilst exploring potential cooperations in low-carbon business;

*JLC* reports that PetroChina Guangdong shipped 10,000 metric tons of 98-RON gasoline to Hong Kong, marking the breakthrough in fuel supply to Hong Kong's retail market.

**Exhibit 1: Brent and WTI weekly prices**

Brent oil price increased 0.3% WoW to US\$78.6/b & WTI oil price rose 1.0% WoW to US\$73.4/b in the week ended 19 Jan 2024

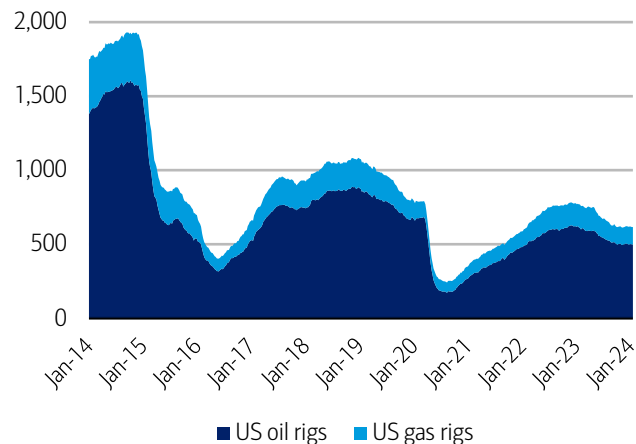


Source: Bloomberg, BofA Global Research

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**Exhibit 2: US weekly oil and gas rig count**

Oil rigs -2 and gas rigs +3 WoW

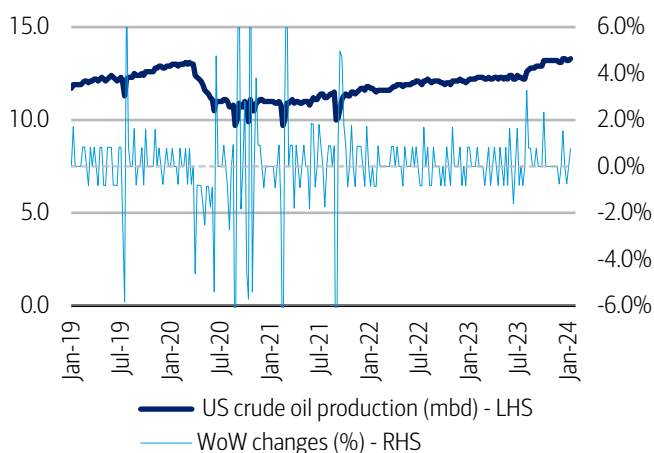


Source: Baker Hughes, Bloomberg, BofA Global Research

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**Exhibit 3: US crude oil production**

Increased WoW to 13.3mbd

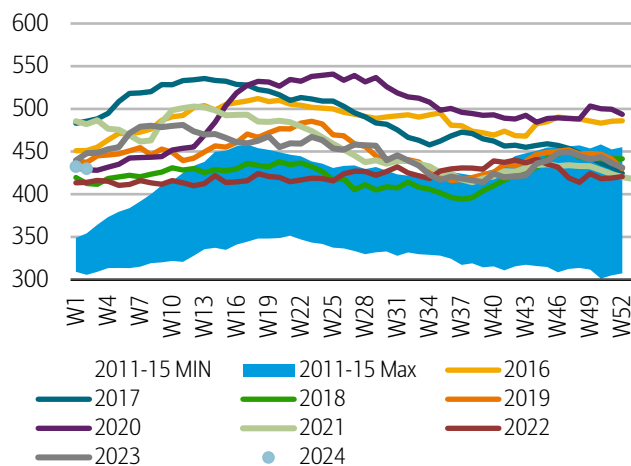


Source: EIA, Bloomberg, BofA Global Research

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**Exhibit 4: US weekly crude oil inventory (mb)**

Decreased 2mb WoW to 430mb

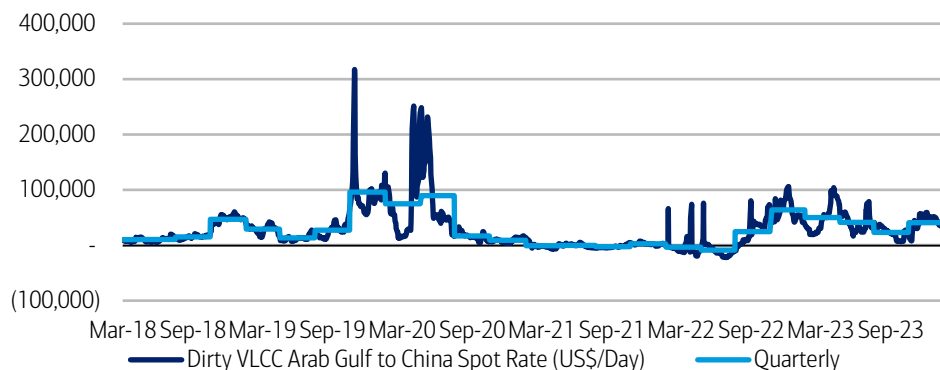


Source: EIA, Bloomberg, BofA Global Research

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**Exhibit 5: Dirty VLCC Arab Gulf to China spot rate (US\$/day)**

Crude oil shipping cost from Arab Gulf to China



Source: Bloomberg, BofA Global Research

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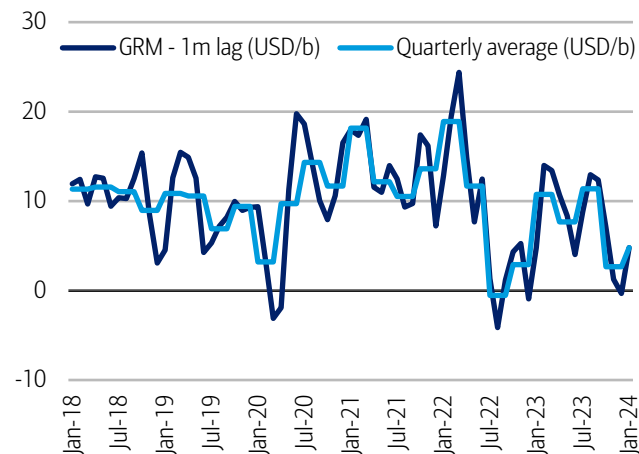


## Refining

- China's refining margin (one-month crude price lag) in Jan 2024 rose to US\$4.8/b, from negative US\$0.3/b in Dec 2023. YTD, average GRM came in at US\$4.8/b;
- National Development and Reform Commission (NDRC) cut gasoline and diesel retail prices both by RMB50/ton in the latest round of price adjustment on 17 Jan 2024; prices are now RMB8,780/ton and RMB7,745/ton, respectively. The next round of price adjustment is scheduled for 31 Jan;
- The run rate of independent refineries in Shandong in the week ended 19 Jan 2024 rose to 62.8% vs. 58.1% in Dec 2023. The YTD rate averaged 61.9% in 2024, vs 61.9% in 2023;
- Based on one-month lag crude price, China diesel crack margin decreased WoW to US\$14.3/b and gasoline crack margin dropped WoW to US\$7.9/b in the week ended 19 Jan 2024;
- Compared with Singapore Dubai Crack margin, the export arbitrage spread for diesel expanded WoW to a positive US\$11.2/b (+US\$3.3/b WoW) and for gasoline it expanded WoW to positive US\$9.3/b (+US\$2.8/b WoW) in the week ended 19 Jan 2024;
- Bloomberg reports that China's oil refinery throughput in 2023 rose to a record at 734.8mnt, +9.3% YoY on post-pandemic fuel demand recovery; Dec throughput was 60.1mnt, +1.1% MoM.

### Exhibit 6: China gross refining margin (GRM) with 1 month lag in crude prices

Profit of US\$4.8/b in Jan 2024, vs. -US\$0.3/b in the previous month

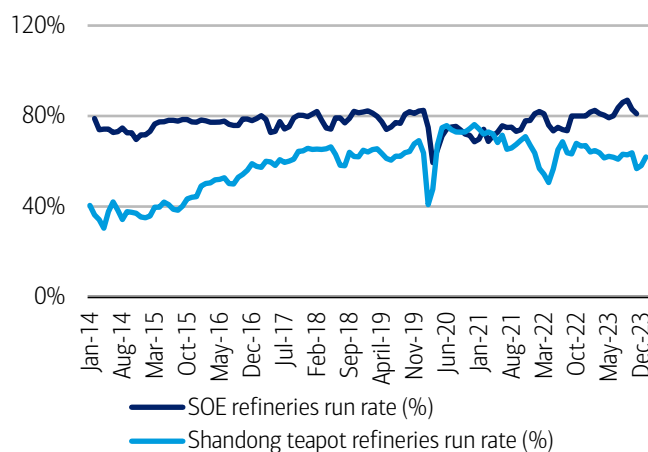


Source: Wind, BofA Global Research estimates

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### Exhibit 7: Shandong teapots refinery run rates (%)

Average run rate of teapots rose to 62.8% vs. 58.1% in Dec for the week ended 19 Jan

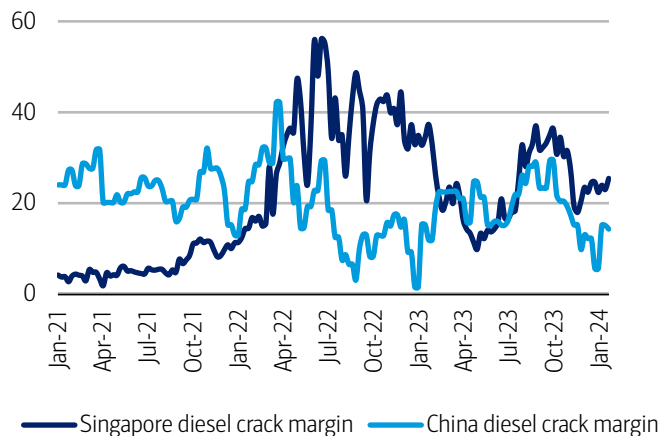


Source: Bloomberg, S&P Global, BofA Global Research

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**Exhibit 8: Diesel crack margin in China vs. Singapore (US\$/b)**

China diesel crack margin was US\$14.3/b for the week ended 19 Jan

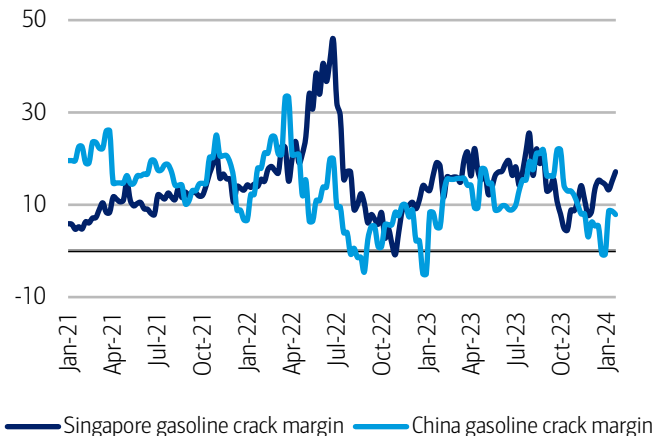


Source: Bloomberg, Wind, BofA Global Research

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**Exhibit 9: Gasoline crack margin in China vs. Singapore (US\$/b)**

China gasoline crack margin was US\$7.9/b for the week ended 19 Jan

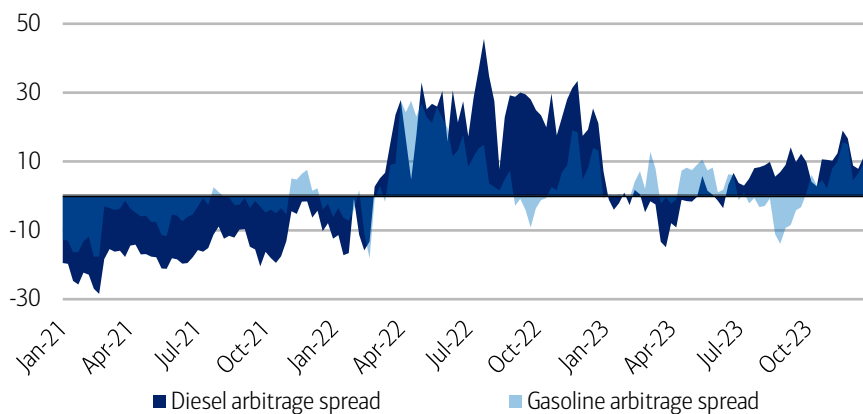


Source: Bloomberg, Wind, BofA Global Research

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**Exhibit 10: Diesel/gasoline export arbitrage spread**

Export arbitrage spread for diesel narrowed WoW to positive US\$11.2/b (+US\$3.3/b WoW) and that for gasoline expanded to positive US\$9.3/b (+US\$2.8/b WoW), respectively, for the week ended 19 Jan



Source: Bloomberg, Wind, BofA Global Research

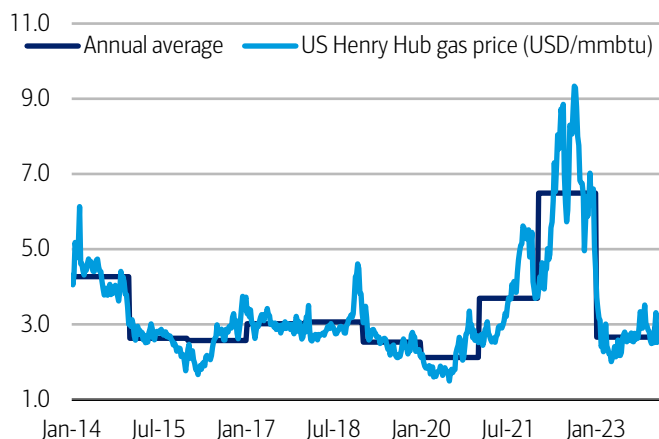
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## Natural gas

- The US Henry Hub natural gas price decreased by 24.0% WoW to US\$2.52/mmbtu in the week ended 19 Jan 2024, 20.6% lower YoY;
- The Netherlands TTF natural gas price decreased by 11.0% WoW to US\$9.04/mmbtu in the week ended 19 Jan 2024, 57.9% lower YoY;
- The JKM swap future decreased by 14.4% WoW to USD9.59/mmbtu (US\$0.55/mmbtu premium over TTF) in the week ended 19 Jan 2024;
- Reuters reports that QatarEnergy stopped LNG shipping via the Red Sea given at least four tankers carrying Qatari LNG have been held up since the US and the UK launched strikes.

### Exhibit 11: US Henry Hub natural gas price (US\$/mmbtu)

Decreased by 24.0% WoW to US\$2.52/mmbtu

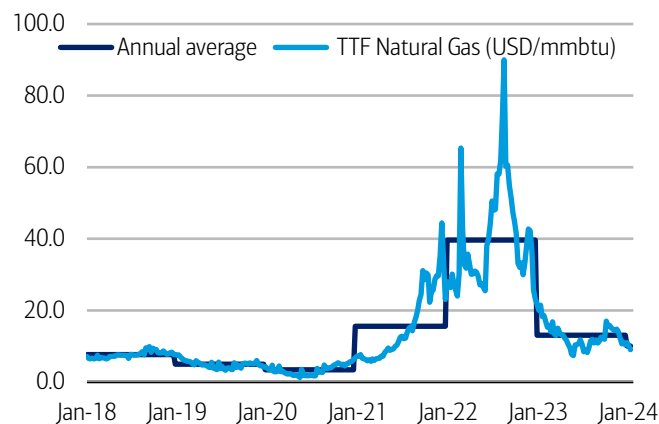


Source: Bloomberg, BofA Global Research

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### Exhibit 12: Netherlands TTF Natural gas price (US\$/mmbtu)

Decreased by 11.0% WoW to US\$9.04/mmbtu

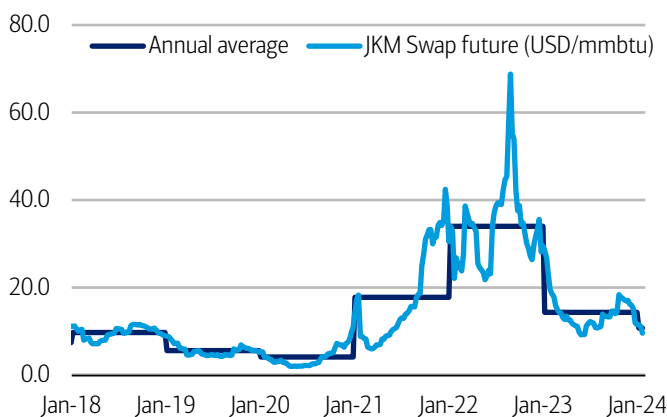


Source: Bloomberg, BofA Global Research

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### Exhibit 13: Northern Asia LNG-JKM swap future (US\$/mmbtu)

Decreased by 14.4% WoW to US\$9.59/mmbtu



Source: Bloomberg, BofA Global Research

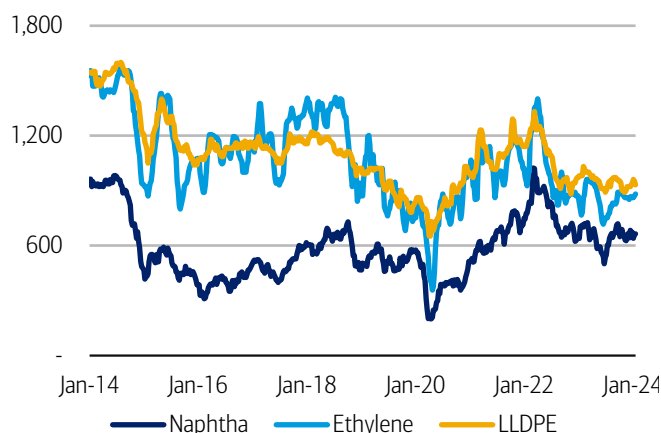
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## Chemicals

- Northeast Asia LLDPE price decreased WoW to US\$931/ton and PP price was flat WoW at US\$949/ton in the week ended 19 Jan 2024;
- LLDPE-ethylene spread narrowed WoW to US\$50/ton;
- PP-propylene spread was flat WoW at US\$153/ton;
- East China m-MDI price increased by 1.0% WoW to RMB20,000/ton and p-MDI price decreased by 0.6% WoW to RMB15,400/ton in the week ended 19 Jan 2024.

### Exhibit 13: Northeast Asia naphtha, ethylene and LLDPE prices (US\$/ton)

Ethylene price increased and LLDPE price decreased WoW

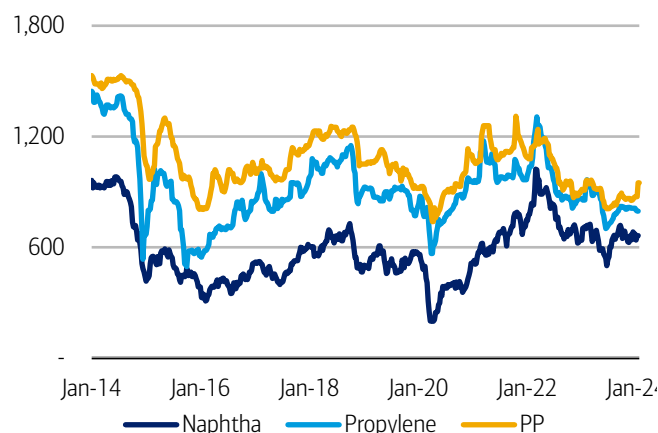


Source: Wind, BofA Global Research

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### Exhibit 14: Northeast Asia naphtha, propylene and PP prices (US\$/ton)

Propylene price and PP price flat WoW

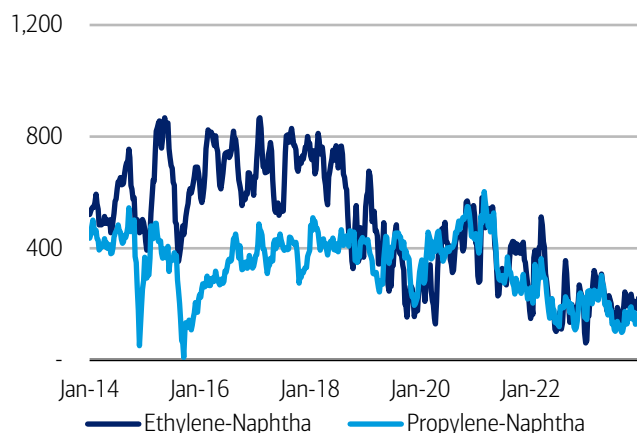


Source: Wind, BofA Global Research

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### Exhibit 15: Northeast Asia ethylene/propylene-naphtha spread (US\$/ton)

Ethylene-naphtha spread expanded and propylene-naphtha spread narrowed WoW

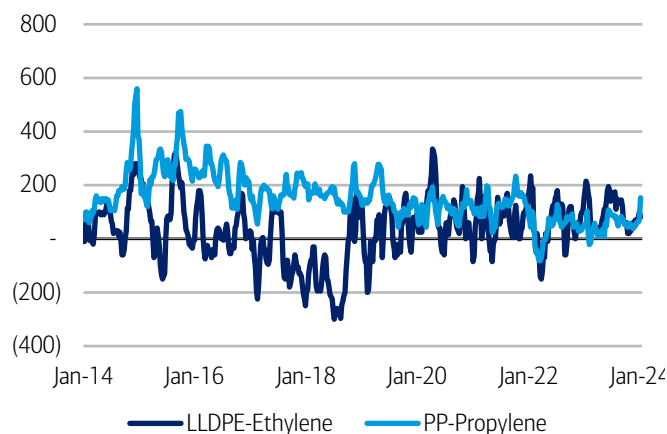


Source: Wind, BofA Global Research

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### Exhibit 16: Northeast Asia LLDPE-ethylene and PP-propylene spread (US\$/ton)

LLDPE-ethylene spread narrowed and PP-propylene spread flat WoW



Source: Wind, BofA Global Research

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**Exhibit 17: East China m-MDI and p-MDI price (RMB/ton)**

East China m-MDI price increased by 1.0% WoW to RMB20,000/ton and p-MDI price decreased by 0.6% WoW to RMB15,400/ton in the week ended 19 Jan



Source: Wind, BofA Global Research

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## Appendix

**Exhibit 19: Abbreviations**

Abbreviations used in the report

Abbreviation	Full name	Abbreviation	Full name
bbl/b	Barrel(s)	m-MDI	Monomeric methylene diphenyl isocyanate
bnt	Billion tons	mntpa	Million tons per year
CCS	Carbon capture and storage	MoM	Month on month
CDU	Crude distillation unit	mnt	Million tons
cm	Cubic meters	MTBE	Methyl tert-butyl ether
CNPC	China national petroleum corporation	NBS	National bureau of statistics
EOR	Enhanced oil recovery	NDRC	National Development and Reform Commission
EVA	Ethylene vinyl acetate	PTR	PetroChina
FDPE	Full density polyethylene	p-MDI	Polymeric methylene diphenyl isocyanate
GRM	Gross refining margin	PP	Polypropylene
HDPE	High density polyethylene	SNP	Sinopec
JKM	Japan/Korea Marker (Northeast Asian spot price index for LNG delivered ex-ship to Japan and Korea)	SOE	State owned enterprise
ktpa	Thousand tons per year	t	Ton(s)
LLDPE	Linear low-density polyethylene	TTF	Title transfer facility
LNG	Liquefied natural gas	UHMWPE	Ultra-high molecular weight polyethylene
mb	Million barrels	VLCC	Very large crude carrier
mbd	Million barrels per day	WoW	Week on week
mmbtu	Metric million British thermal unit	WTI	West Texas Intermediate
mmt	Million metric tons	YoY	Year on year
MDI	Methylene diphenyl isocyanate	YTD	Year to date

Source: BofA Global Research

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