

# FPI Plastics Update

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October 24, 2024

Peter Feng

Vice President, Aromatics



CHEMICAL  
MARKET  
ANALYTICS  
BY OPIS, A DOW JONES COMPANY

The Dow Jones logo, consisting of a stylized 'D' and 'J' intertwined, is positioned at the top left of the image. The background features a blue wireframe globe with glowing nodes and connecting lines, set against a dark blue gradient.

# DOW JONES

## CHEMICAL MARKET ANALYTICS

BY OPIS, A DOW JONES COMPANY

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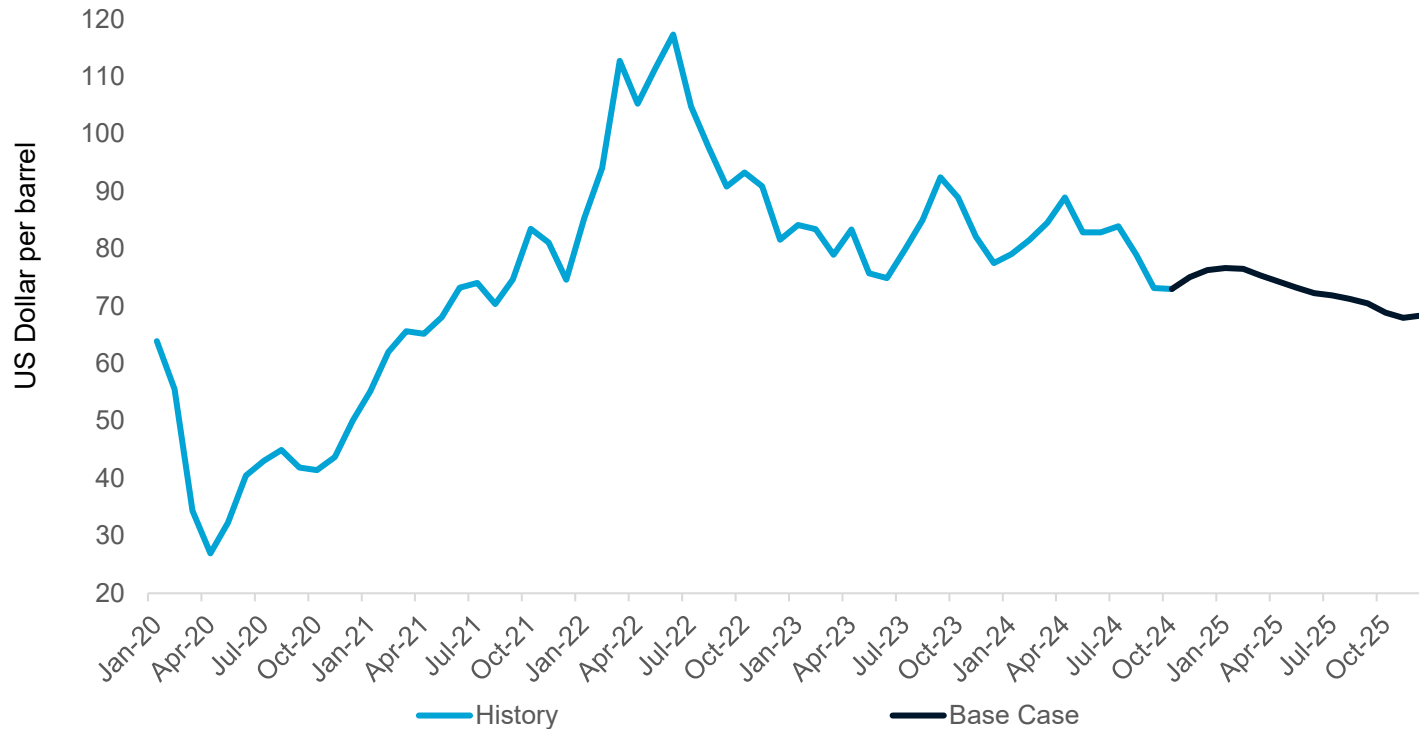
# Energy & Economy



# Crude oil: price and forecast and assumptions

Prices remain on the low side as OPEC unwinds cuts, demand remains weak

## ICE Brent Price Forecast



Source: Rystad, Energy, Chemical Market Analytics by OPIS

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\$/bbl	Q1 2024	Q2 2024	Q3 2024	Q4 2024	Q1 2025	Q2 2025	Q3 2025	Q4 2025
Brent	82	85	79	75	76	73	71	68
WTI	77	81	75	71	72	70	68	65

### Base Case Assumptions

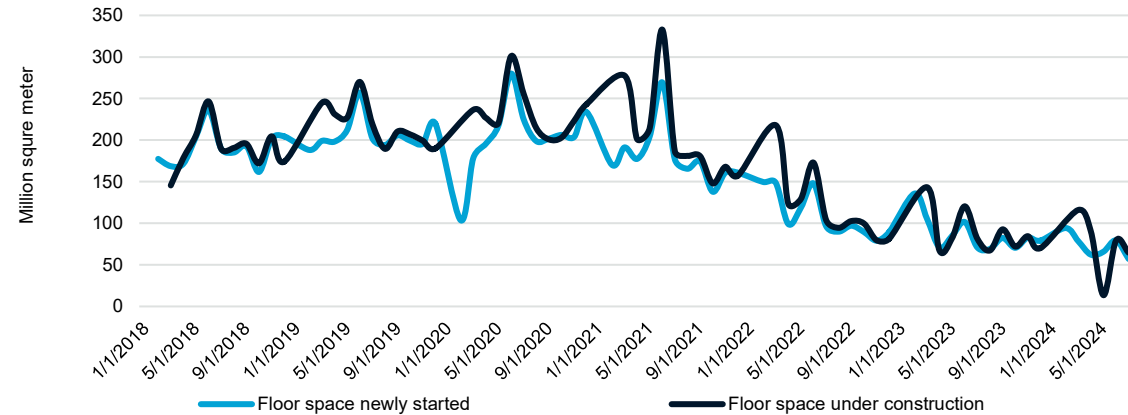
- OPEC+ voluntary cuts complied with a 90% rate
- OPEC+ maintain 2.2 MMb/d voluntary cuts through November with a gradual unwind between December 2024 and November 2025
- Russian crude and condensate production averages 10.2 MMb/d in 2024
- No full blown-out regional conflict

### Key developments to monitor

- Geopolitical developments in the Middle East and Ukraine-Russia
- Compliance on OPEC+ cuts; OPEC production policy changes for the rest of the year
- Global refinery runs ramp-up and key product stock levels
- Macroeconomic environment

# China: Property slump & sequential economic slowdown

China Newly Started and under Construction Floor Space (Monthly Additions)



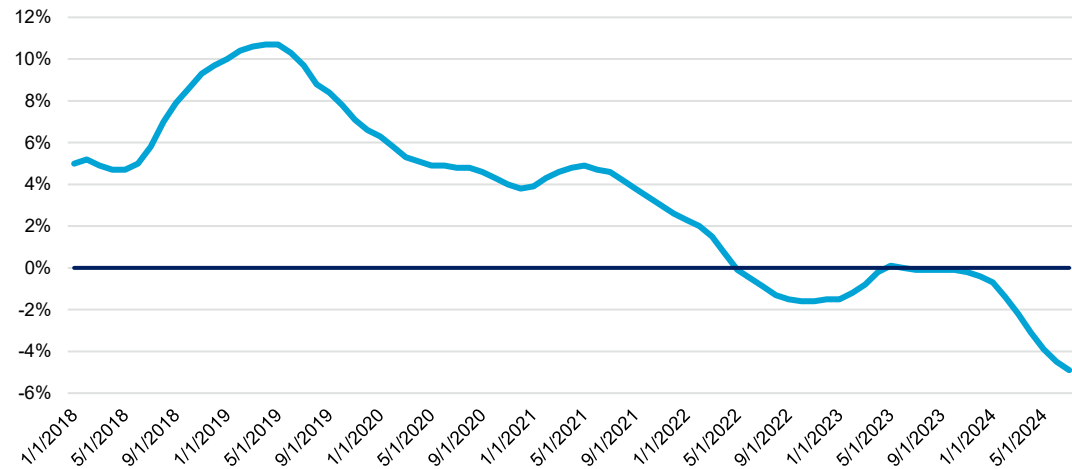
Source: National Bureau of Statistics of China

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20% fiscal revenue  
70% household wealth  
24% of GDP  
25% of bank loans

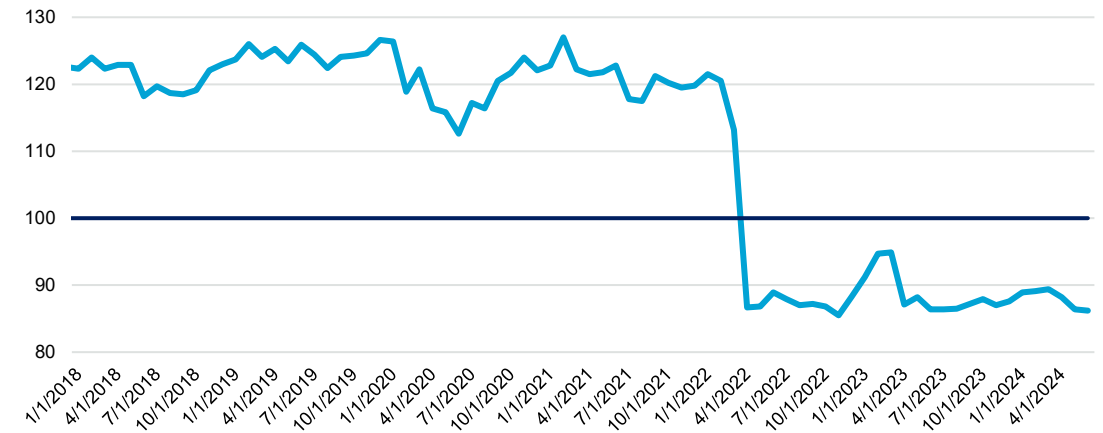
China Newly Built House Prices (YoY %Change)



Source: National Bureau of Statistics of China

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China Consumer Confidence Index

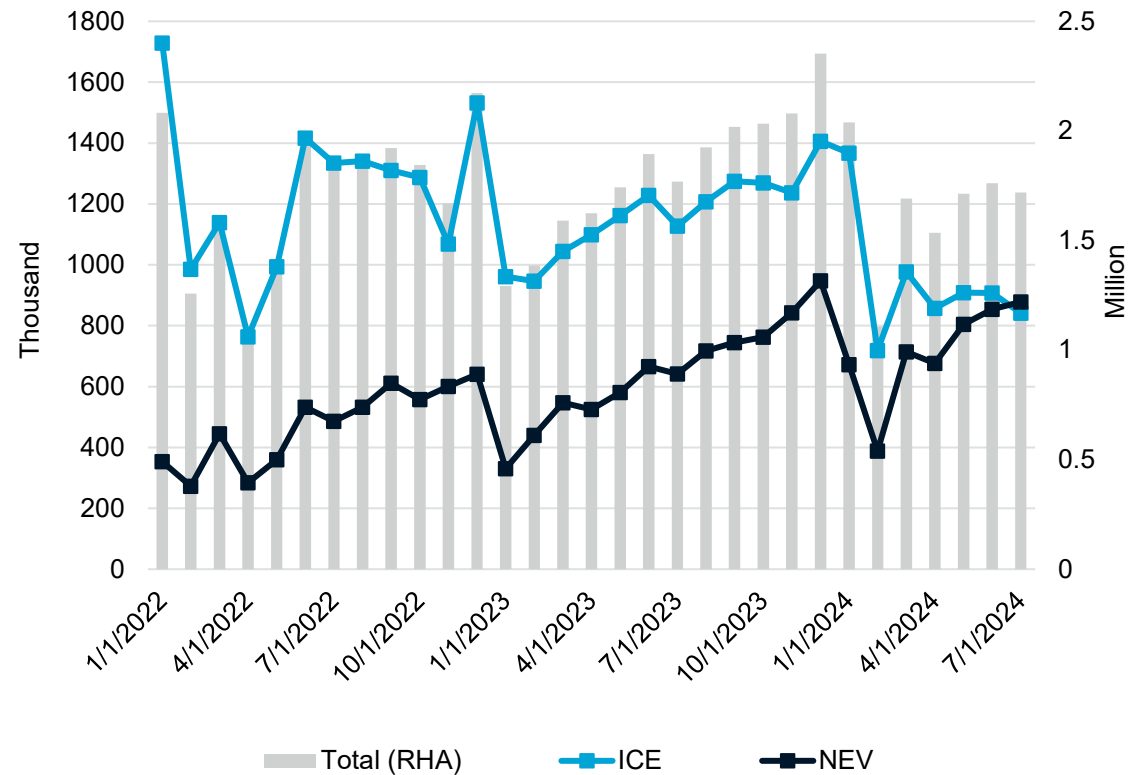


Source: National Bureau of Statistics of China

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# China: Structural change in fuel consumption

### China New Car Sales

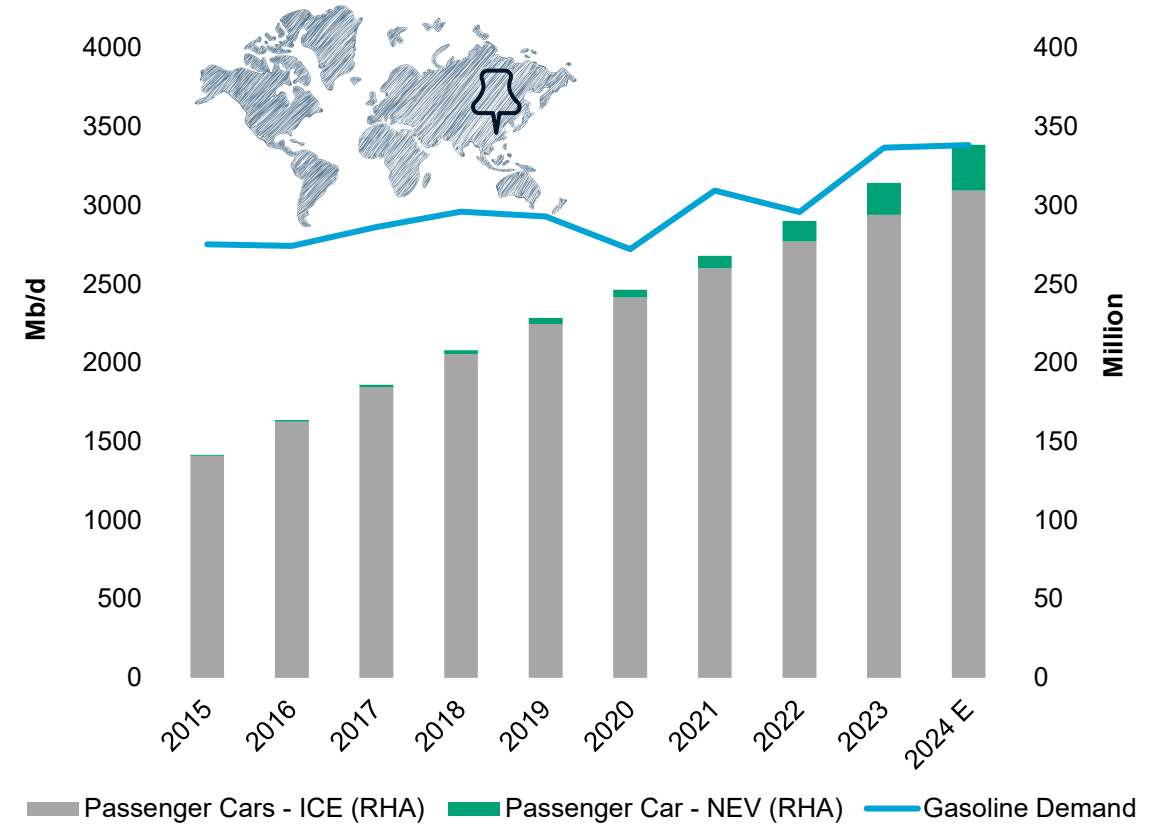


Note: NEV = BEV + PHEV

Source: CPCA

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### Passenger Cars and Gasoline Consumption in China



Source: Ministry of Public Security, NBS, Rystad Energy

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# Major Trends



## Globalization to Regionalization (Friendshoring)

- Elevated freight rates
- Duties
- Carbon Border Adjustment Mechanism
- Supply chain risks



## Energy Transition

- Gasoline to Electric
- Biodiesel and Sustainable Aviation Fuel
- Solar, Wind, Nuclear
- What happens to feedstocks for plastics?



## Climate Change/Sustainability

- Biomaterials
- Carbon Neutral
- Life Cycle Analysis
- End of Life-Biodegradable

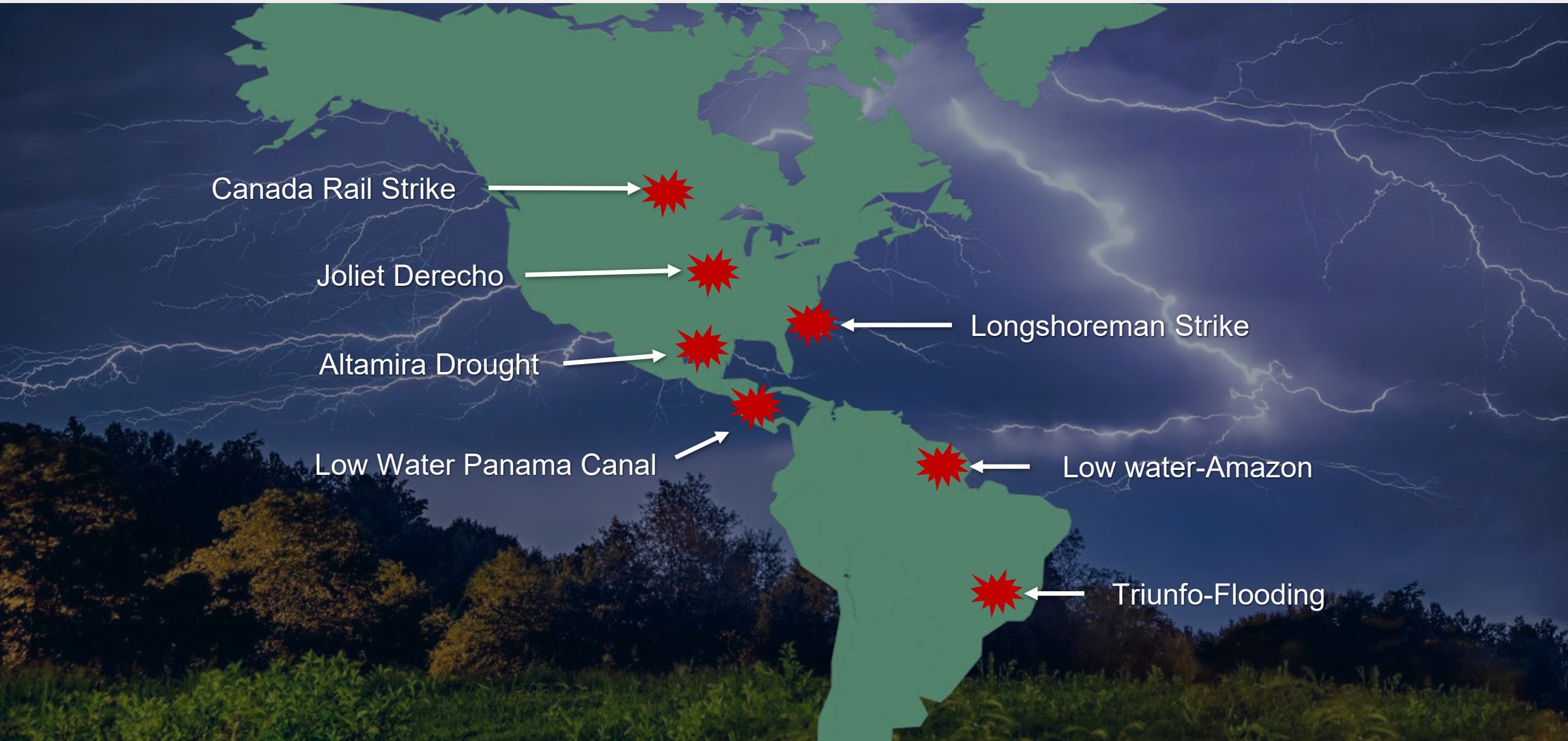


## Demographics

- Aging of China population
- Growth of India etc
- Immigration
- Urbanization & Growth of Middle Class



# 2024: Unprecedented weather & supply chain disruptions



Canada Rail Strike

Joliet Derecho

Altamira Drought

Low Water Panama Canal

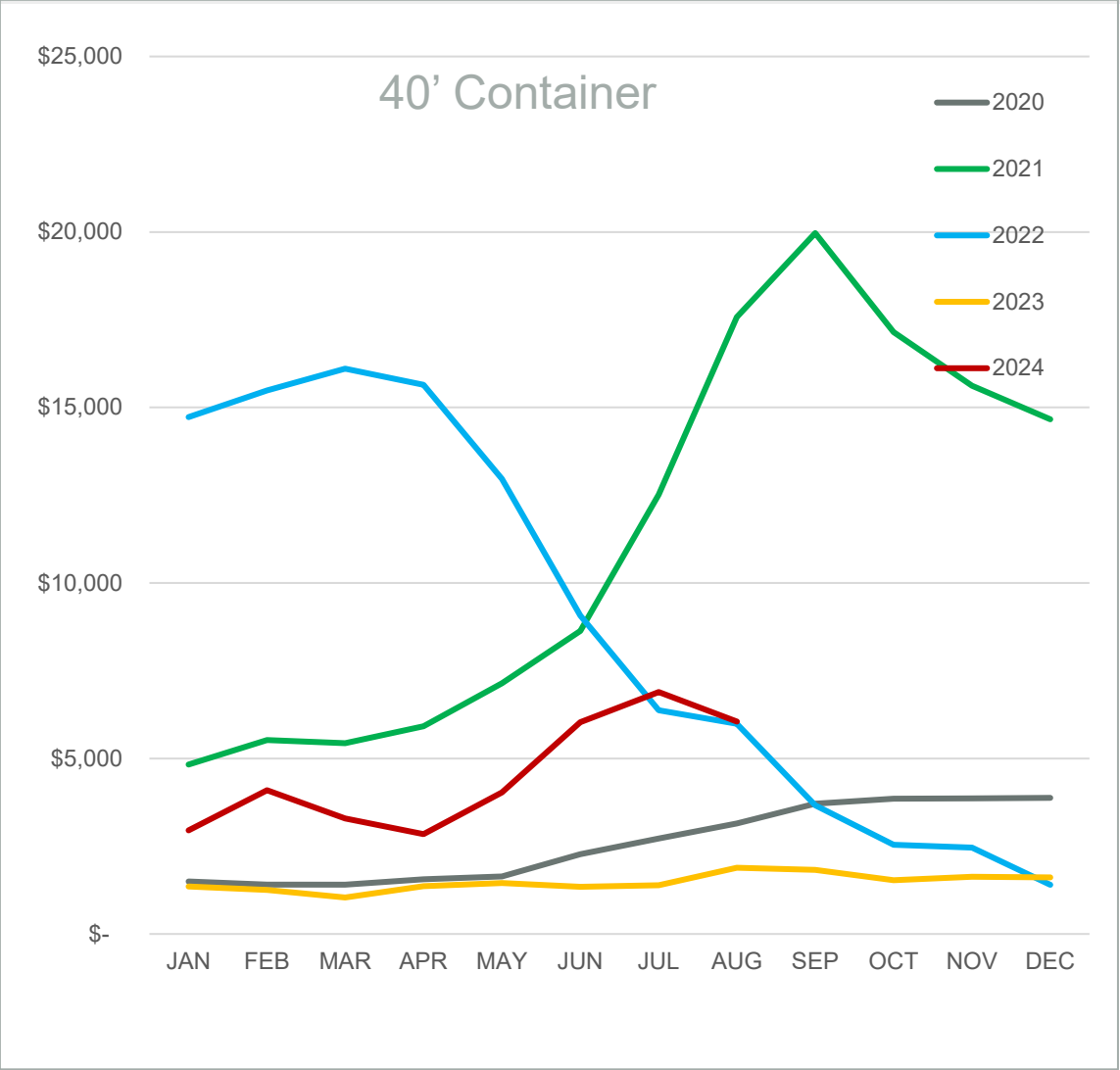
Longshoreman Strike

Low water-Amazon

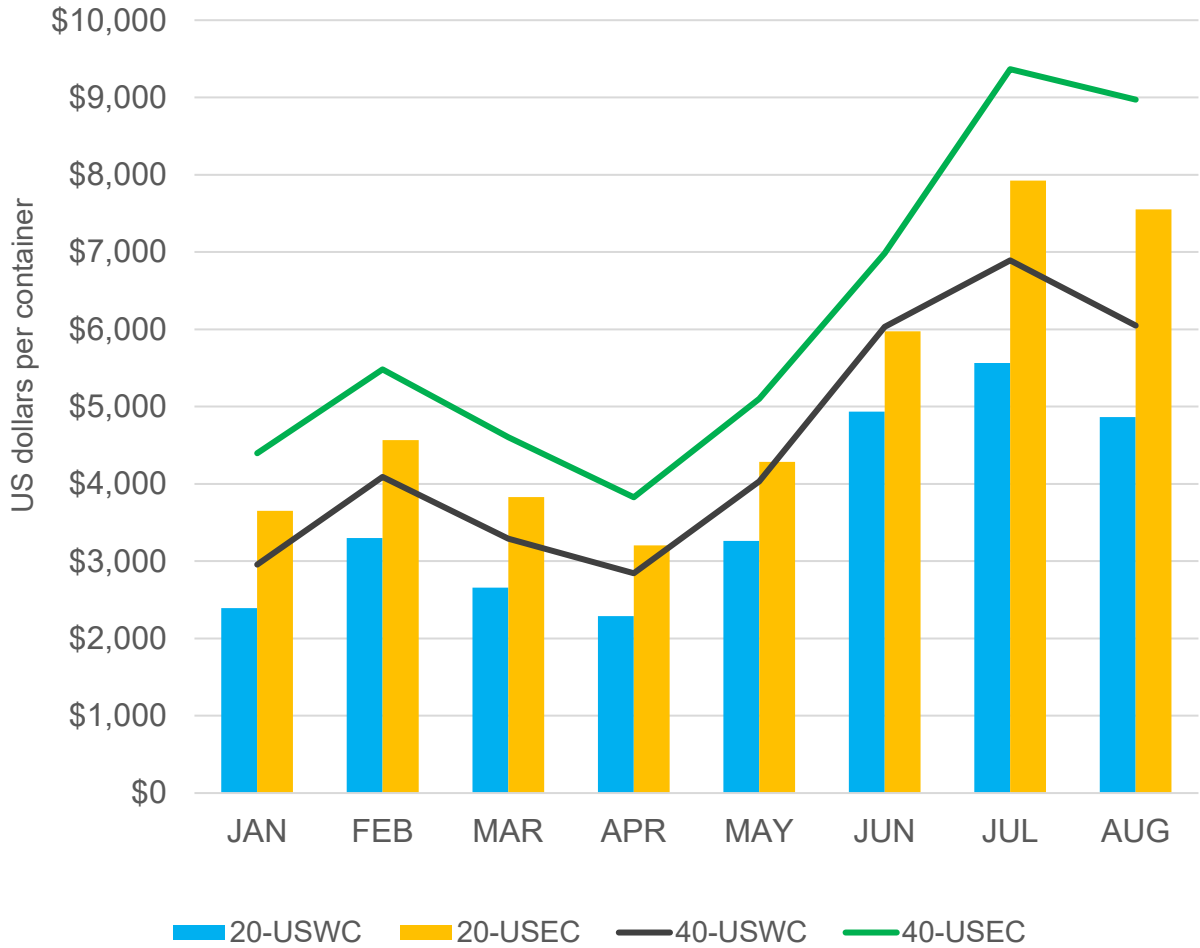
Triunfo-Flooding



# Freight rates – East Asia to North America

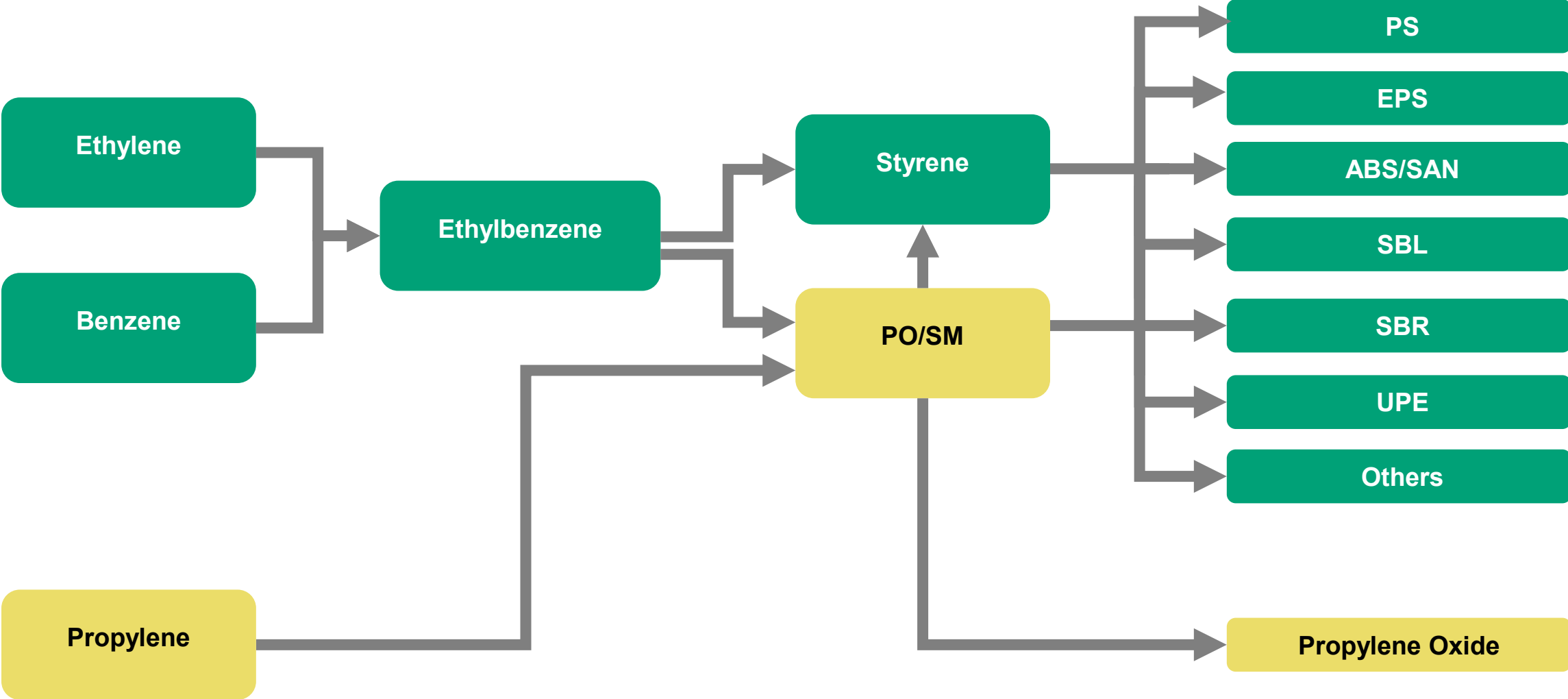


## Freight rates NE Asia to the United States



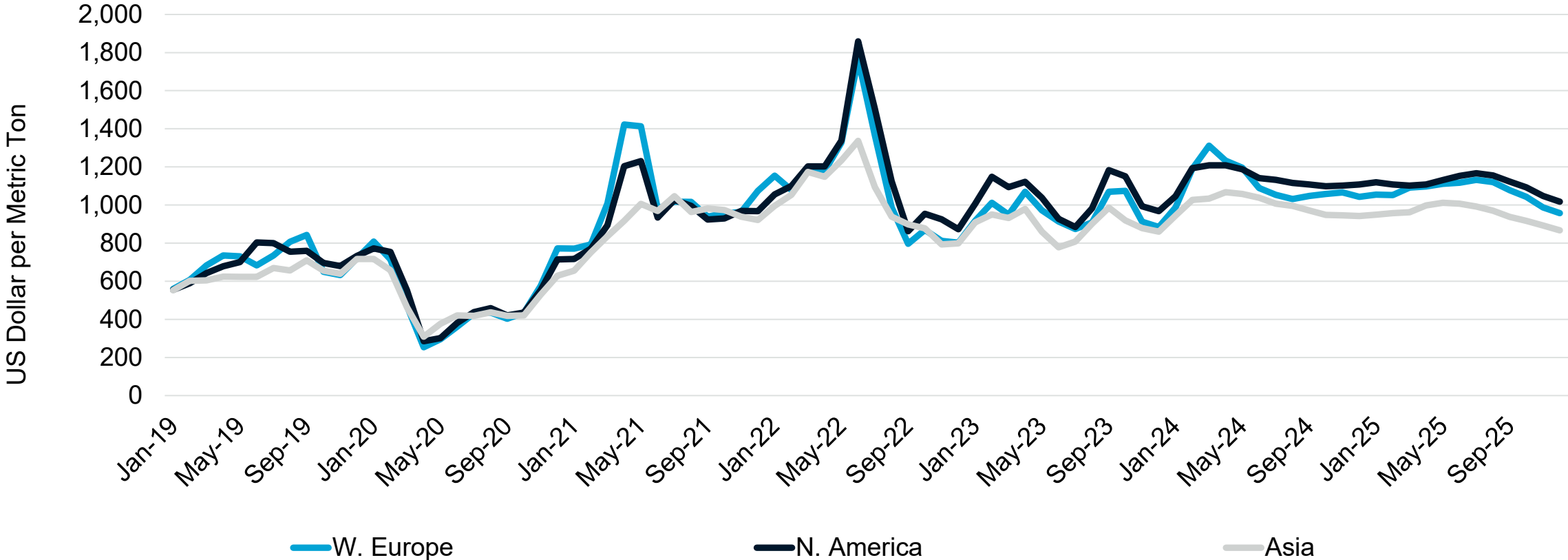
# Polystyrene

# Process flow diagram for styrene derivatives



# Benzene - Asia sets the floor with North America and Western Europe paying premiums for imports

## Regional Benzene Prices

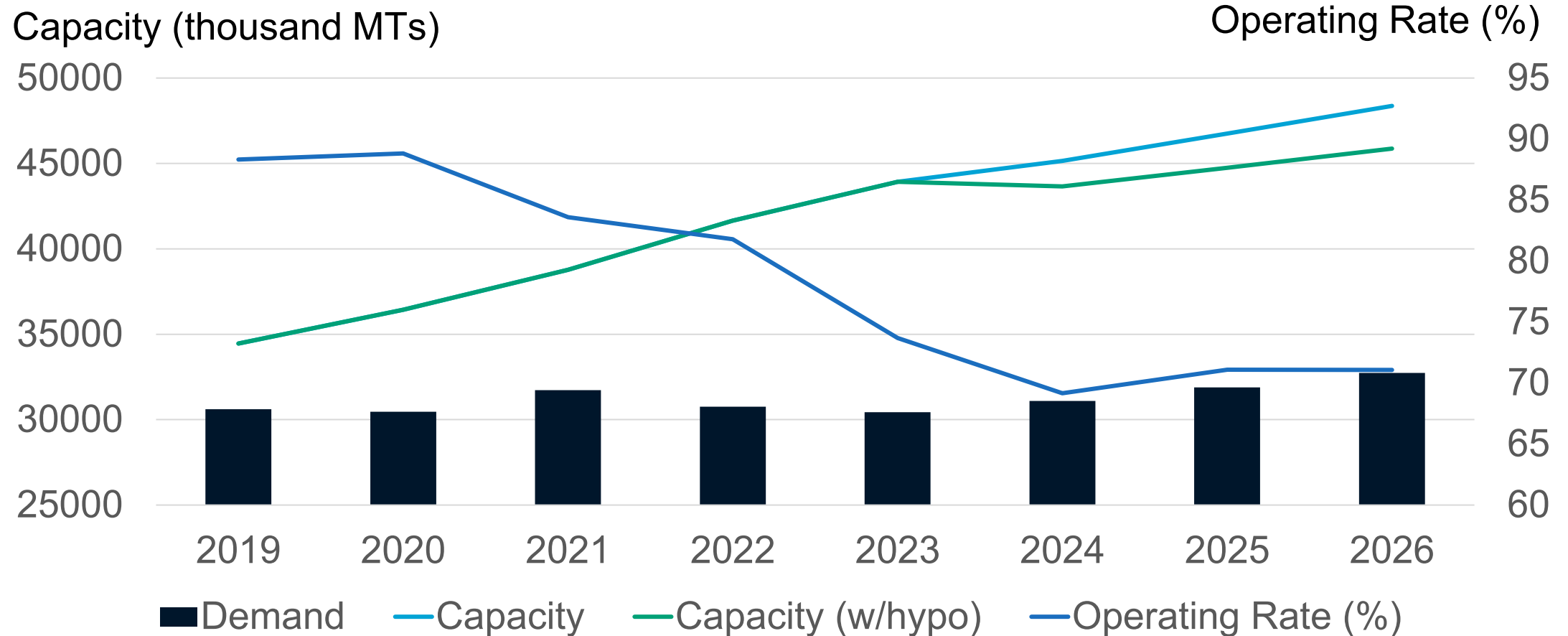


Source: Chemical Market Analytics by OPIS

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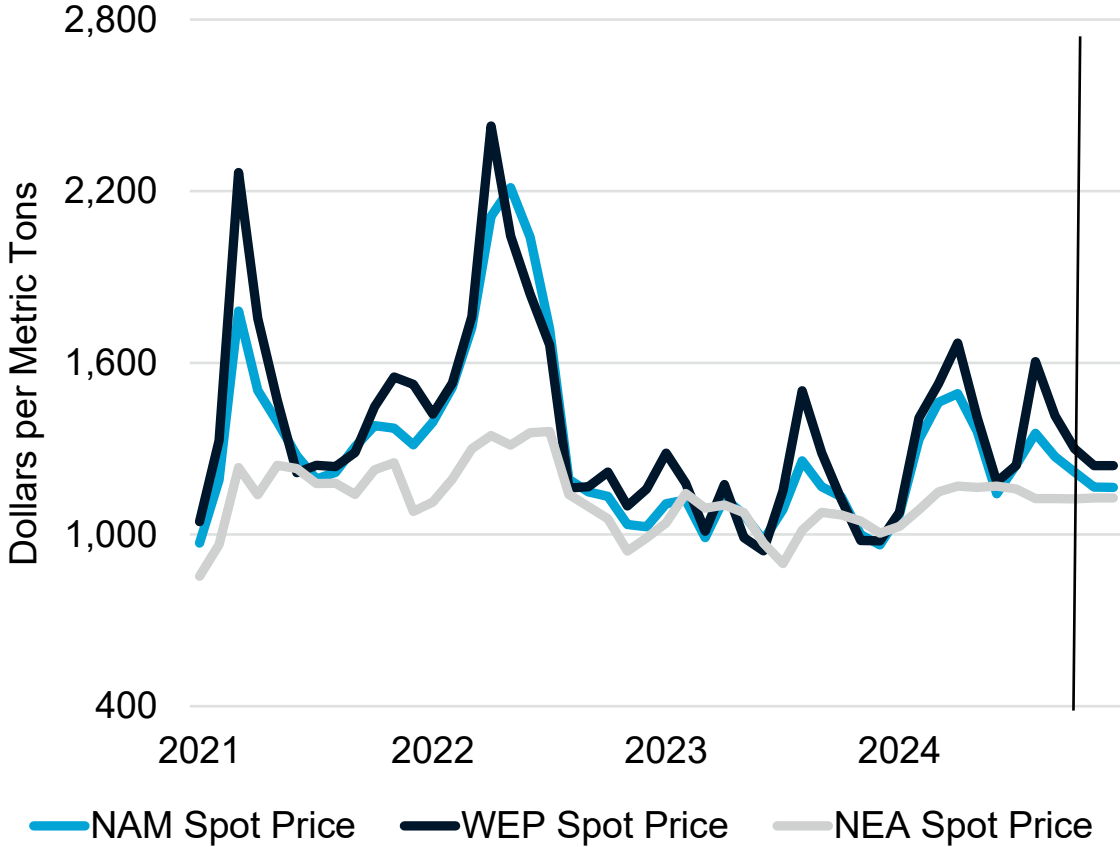
# Styrene is globally oversupplied

## World Styrene Supply Demand



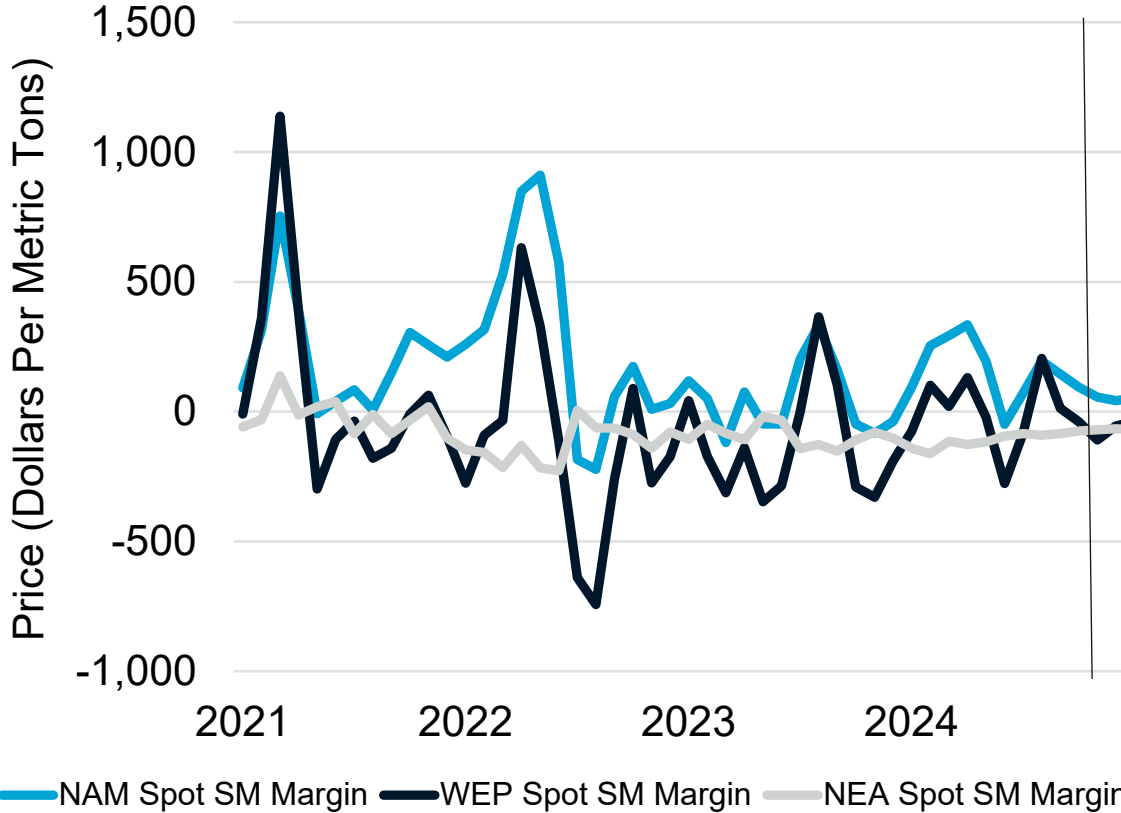
# However, styrene prices and margins are volatile

### Global Styrene Price Comparison



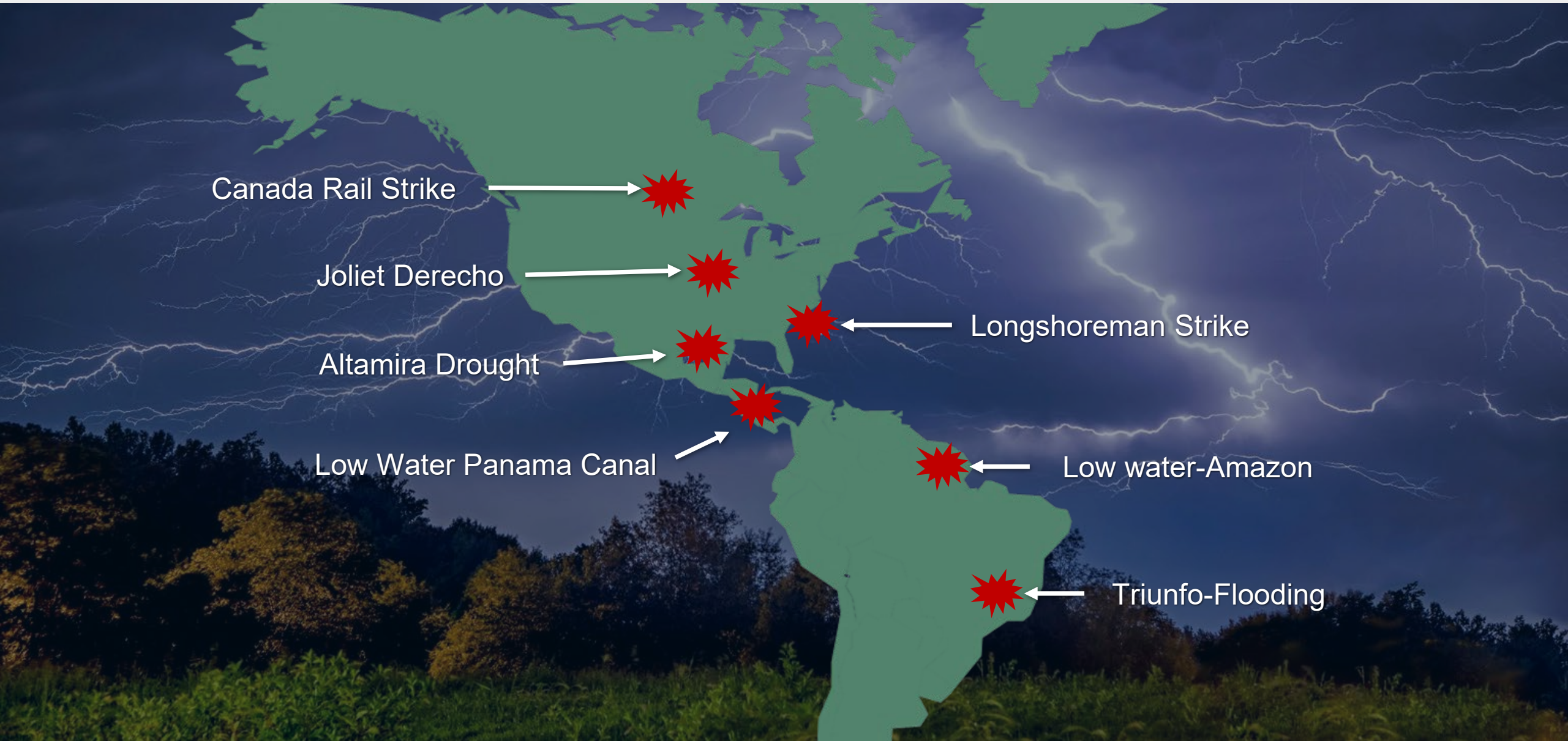
Source: Chemical Market Analytics by OPIS © 2022 Oil Price Information Service, LLC.

### Global Styrene Spot Margin Comparison



Source: Chemical Market Analytics by OPIS © 2024 Oil Price Information Service, LLC.

# 2024: Unprecedented weather & supply chain disruptions



Canada Rail Strike

Joliet Derecho

Altamira Drought

Low Water Panama Canal

Longshoreman Strike

Low water-Amazon

Triunfo-Flooding

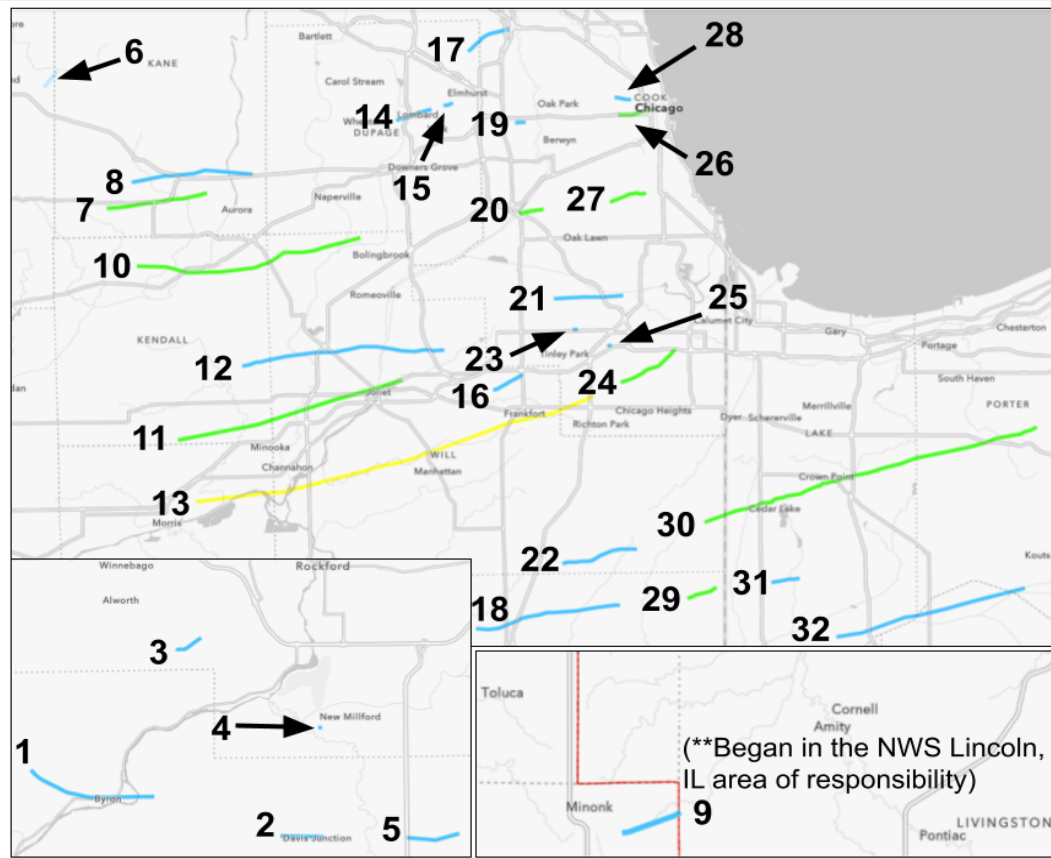
# Weather Related Outages – Derecho causes PS plants to shutdown

## July 15 Derecho August 8, 2024

32 Tornadoes Confirmed in the NWS Chicago Forecast Area

7/15/2024 Tornadoes			
Confirmed Tornadoes		32	
1. Byron	EF-0	18. Manteno	EF-0
2. Davis Junction	EF-0	19. Broadview	EF-0
3. S. Winnebago County #1	EF-0	20. Justice	EF-1
4. S. Winnebago County #2	EF-0	21. Crestwood - Blue Island	EF-0
5. Monroe Center	EF-0	22. Peotone	EF-0
6. Maple Park*	EF-U	23. Oak Forest	EF-0
7. Sugar Grove - Aurora	EF-1	24. Flossmoor - Thornton	EF-1
8. Sugar Grove - N. Aurora	EF-0	25. Country Club Hills	EF-0
9. Minonk/Flanagan**	EF-0	26. Chicago: Near West Side	EF-1
10. Yorkville - S. Naperville	EF-1	27. Chicago: Chicago Lawn - West Englewood	EF-1
11. Minooka - Joliet	EF-1	28. Chicago: West Town	EF-0
12. W. Joliet - Lockport	EF-0	29. Grant Park	EF-1
13. Channahon - Matteson	EF-2	30. Cedar Lake - Valparaiso	EF-1
14. Glen Ellyn - Lombard	EF-0	31. Lowell	EF-0
15. Villa Park	EF-0	32. Shelby - Pleasant Township	EF-0
16. Mokena	EF-0		
17. Bensenville - Rosemont	EF-0		

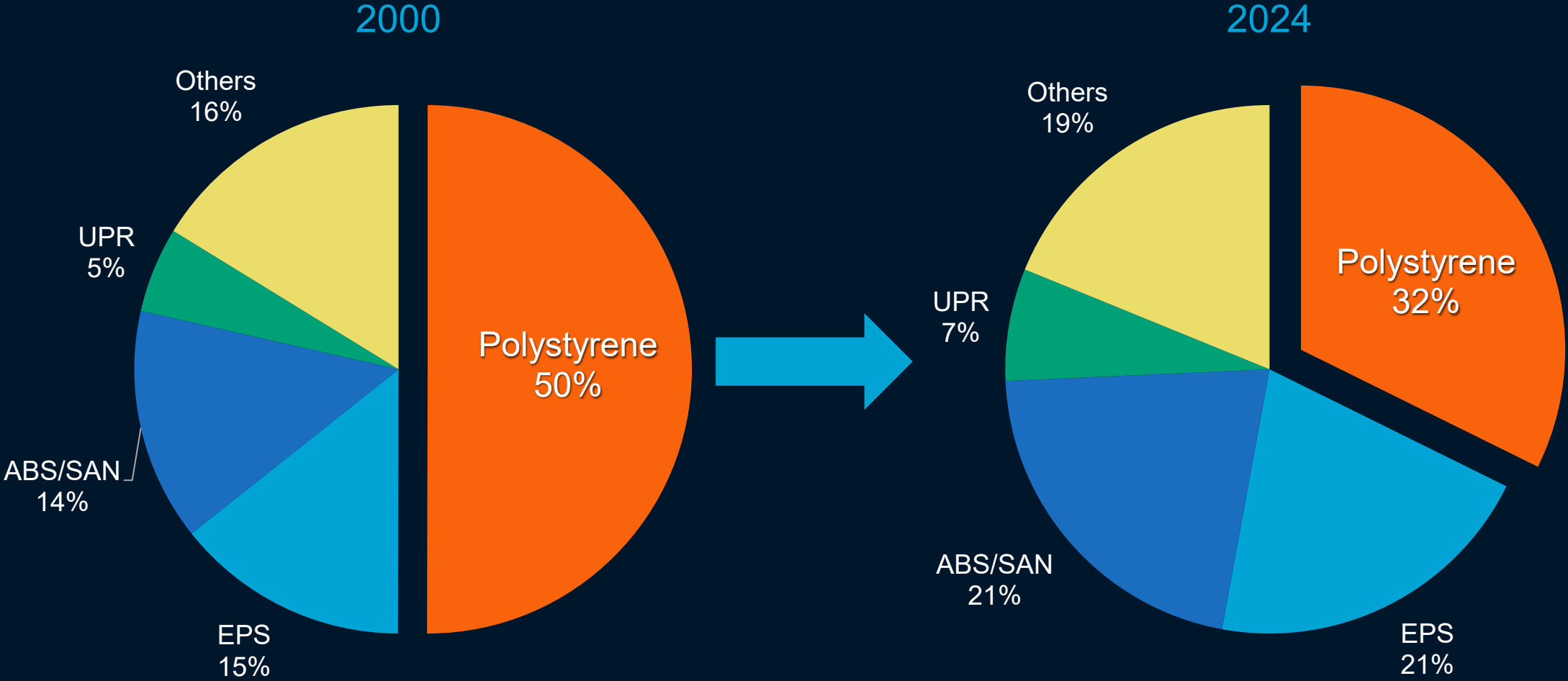
**\*EF-U = EF-Unknown**  
Unable to assign wind speed estimate as the tornado did not cause damage to any qualified damage indicators.



- Styrolution PS shuts down and declares FM
- Down for 1.5-7 mo
- AmSty PS shuts down
- Down for 2+ mo
- Spare capacity prevents extreme shortages



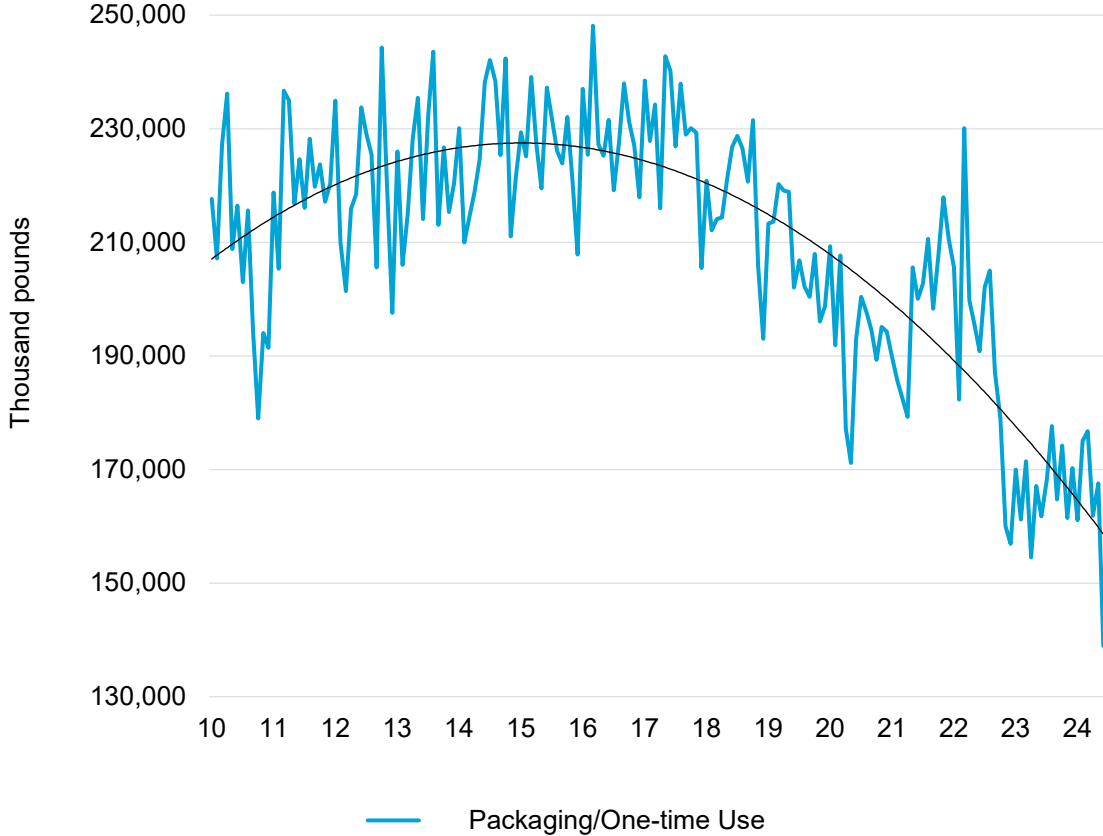
# Polystyrene (PS) share of global SM demand has shrunk



Source: Chemical Market Analytics by OPIS  
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# PS packaging demand continues to contract

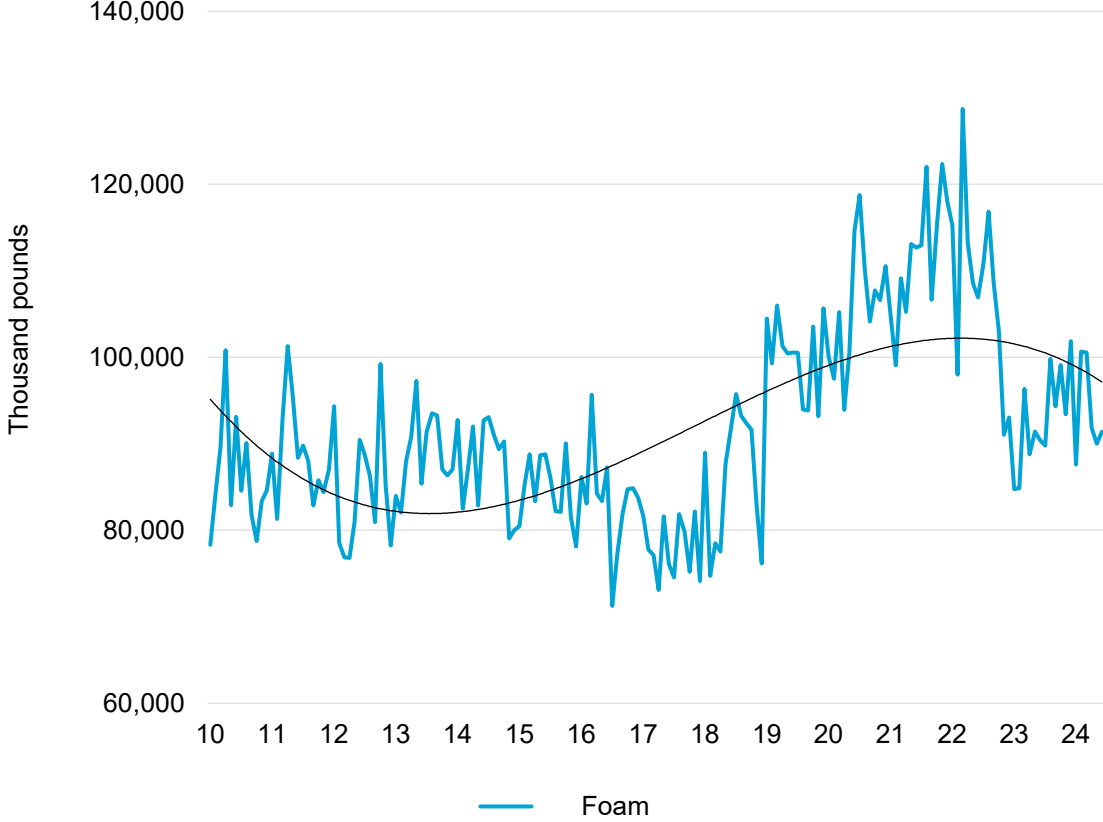
Packaging/One-time Use



Source: Chemical Market Analytics by OPIS

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Foam

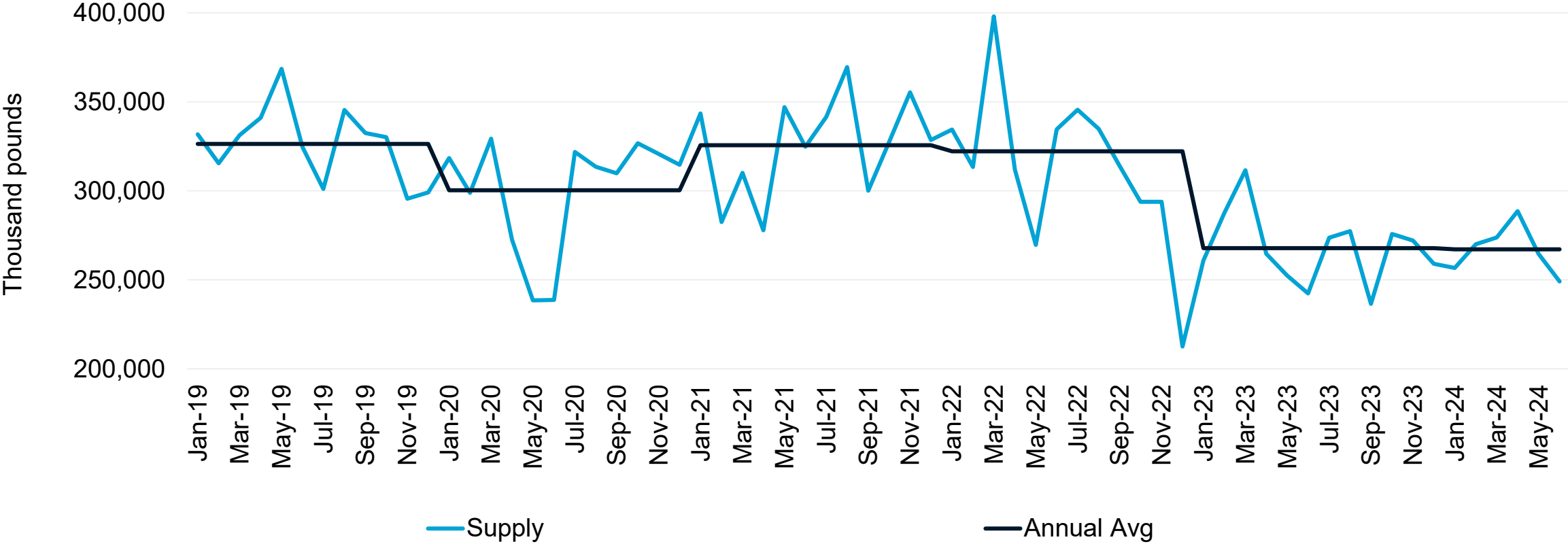


Source: Chemical Market Analytics by OPIS

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# PS production has slowed post-pandemic

## North America PS Production



Source: Chemical Market Analytics by OPIS

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## Mergers and Acquisition

**Goodyear is thinking of selling its chemical business, Dunlop tire brand and off-the-road business**

**Trinseo Announces Commencement of Sale Process for Interest in Americas Styrenics**

**Shell to sell interest in Singapore Energy and Chemicals Park to CAPGC**

**TotalEnergies, Sabic considering selling U.S. chemical plant, sources say**

### *Private Equity*

**Exit Ramp: Epsilyte's Rapid Growth Builds Following**

**LyondellBasell Weighs Strategic Options for European Assets**

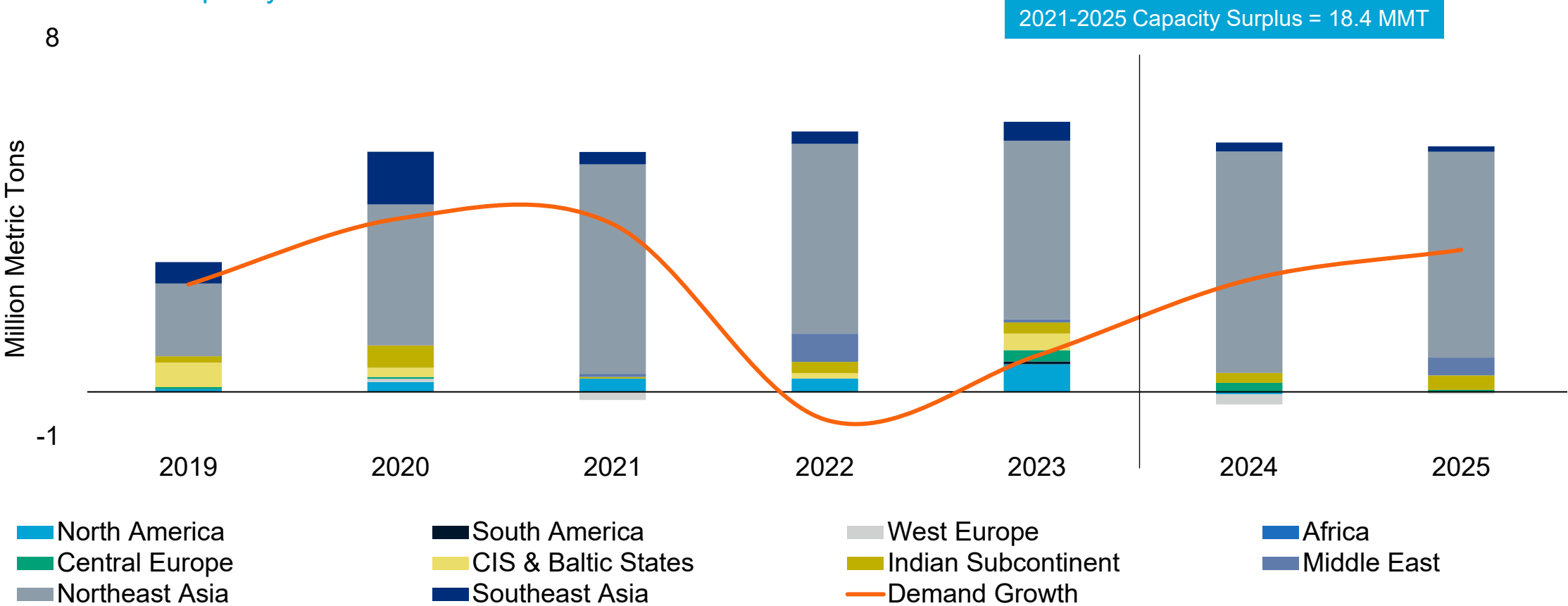


# Polypropylene



# Historical polypropylene capacity overhang

World Total PP Capacity Additions vs. Demand Growth



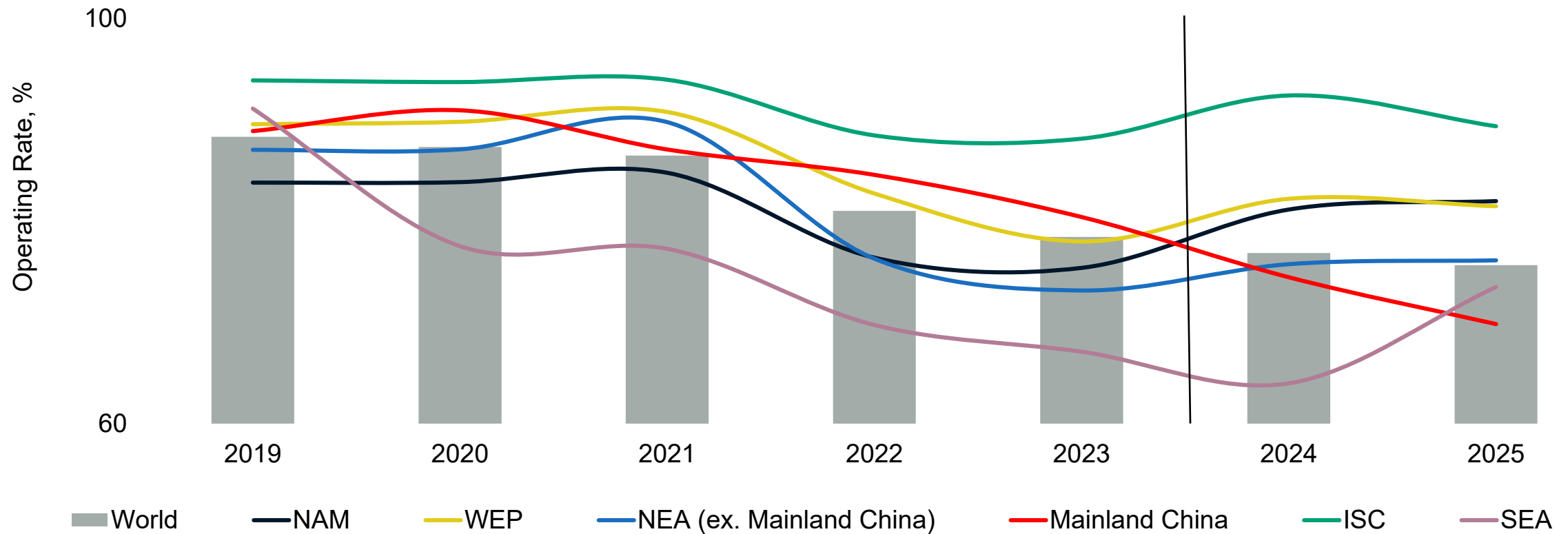
Source: Chemical Market Analytics by OPIS

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# Operating rates plummeting

The last time world operating rates fell below 80% was in 1981-82, averaging at ~78%

## Global Polypropylene Operating Rates



Source: Chemical Market Analytics by OPIS

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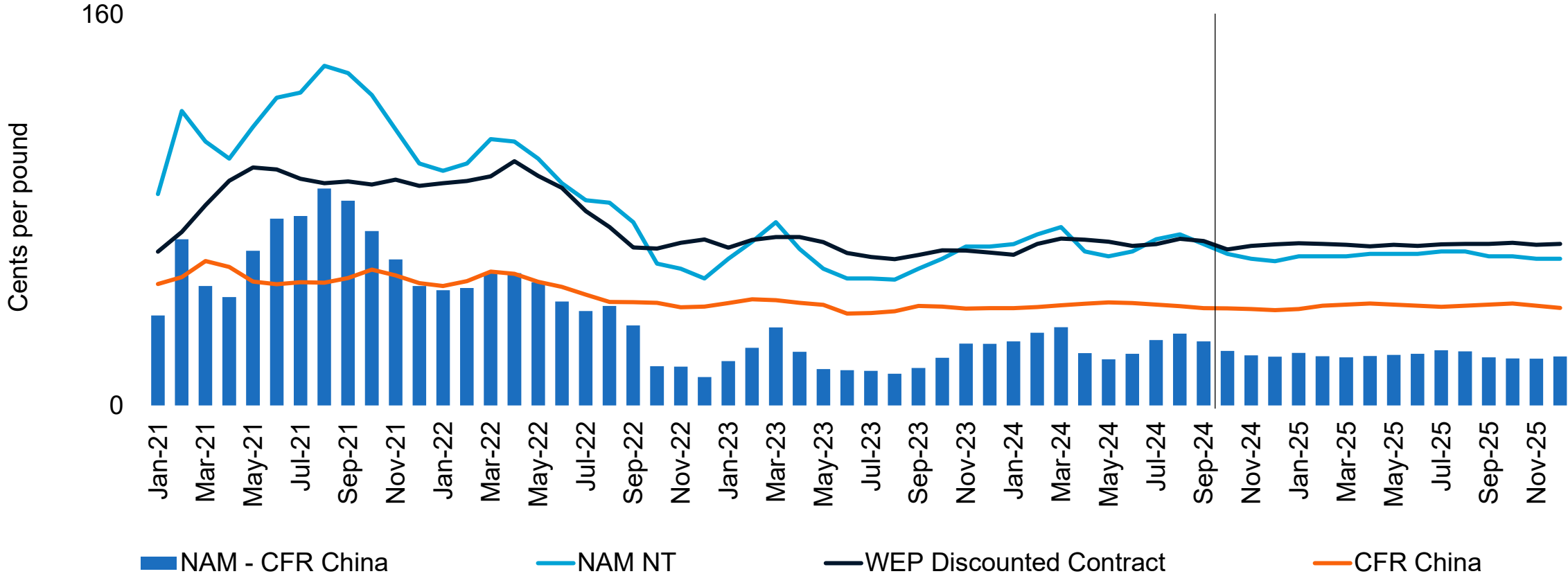
# Recent/New Capacity in North America – One more left

Company	Location	Country	Capacity (kta)	Startup
Heartland Polymers Ltd	Alberta	Canada	525	Q3-22
ExxonMobil Chemical Company	Louisiana	United States	450	Q4-22
Invista	Texas	United States	45	Q1-24
Formosa Plastics Corp	Texas	United States	250	Q4-24



# Relatively flat pricing expected

PP Prices by Region

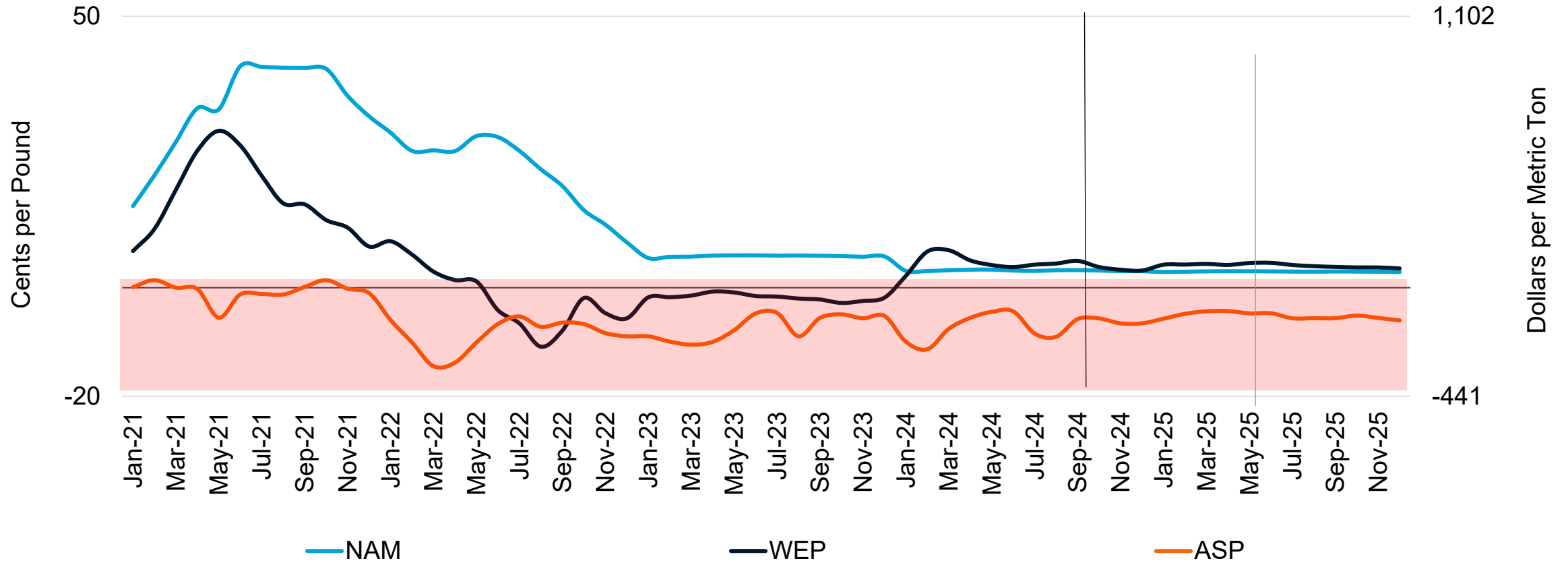


Source: Chemical Market Analytics by OPIS

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# Trough market conditions expected

## Polypropylene Non-integrated Margins by Region

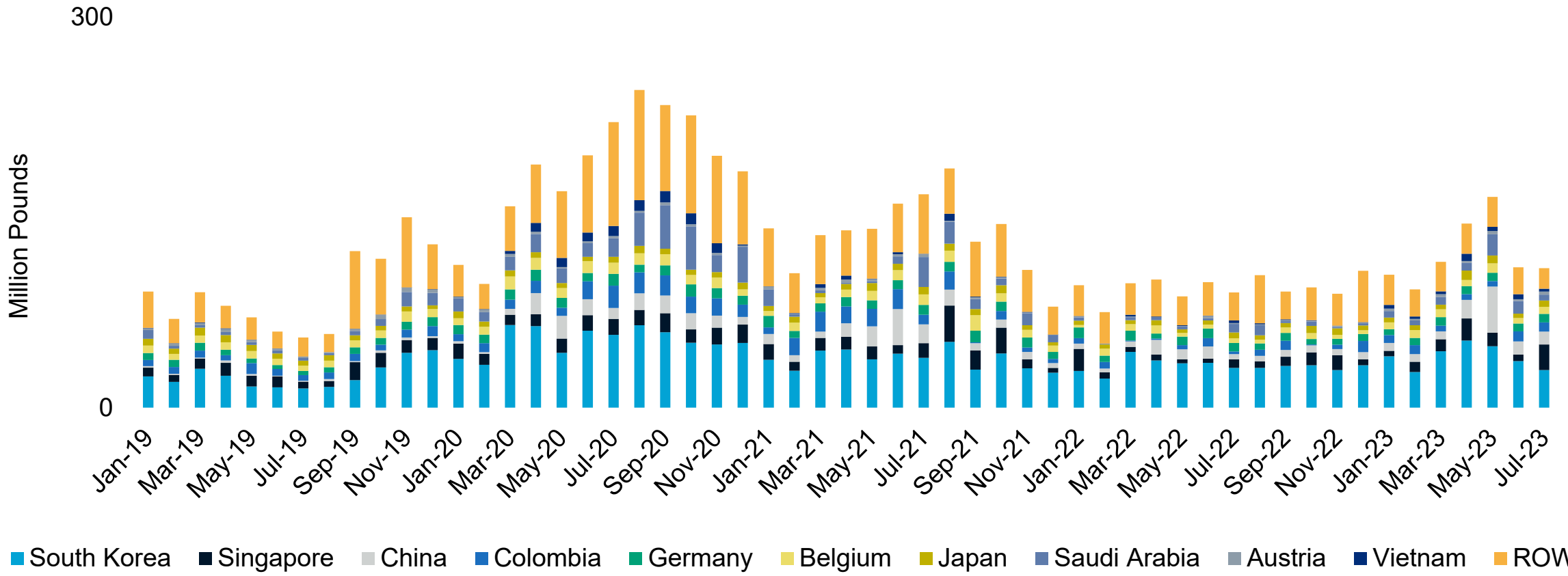


Source: Chemical Market Analytics by OPIS

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# US PP resin imports may not decline with expanding arb with Asia

## NAM PP Resin Imports



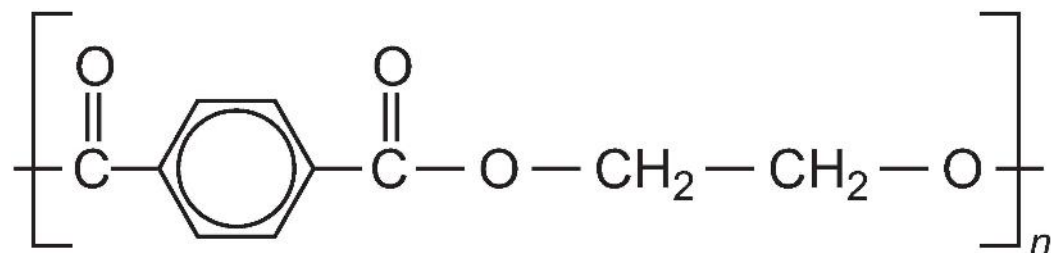
Source: Global Trade Tracker

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# PET



# Polyester/PET – A versatile molecule



**Polyethylene terephthalate  
(PET or polyester)**



# Global PET market as of 2024



Bottles sold every minute  
**~ 4 M**



Estimated annual demand  
**~ 30 M tons**



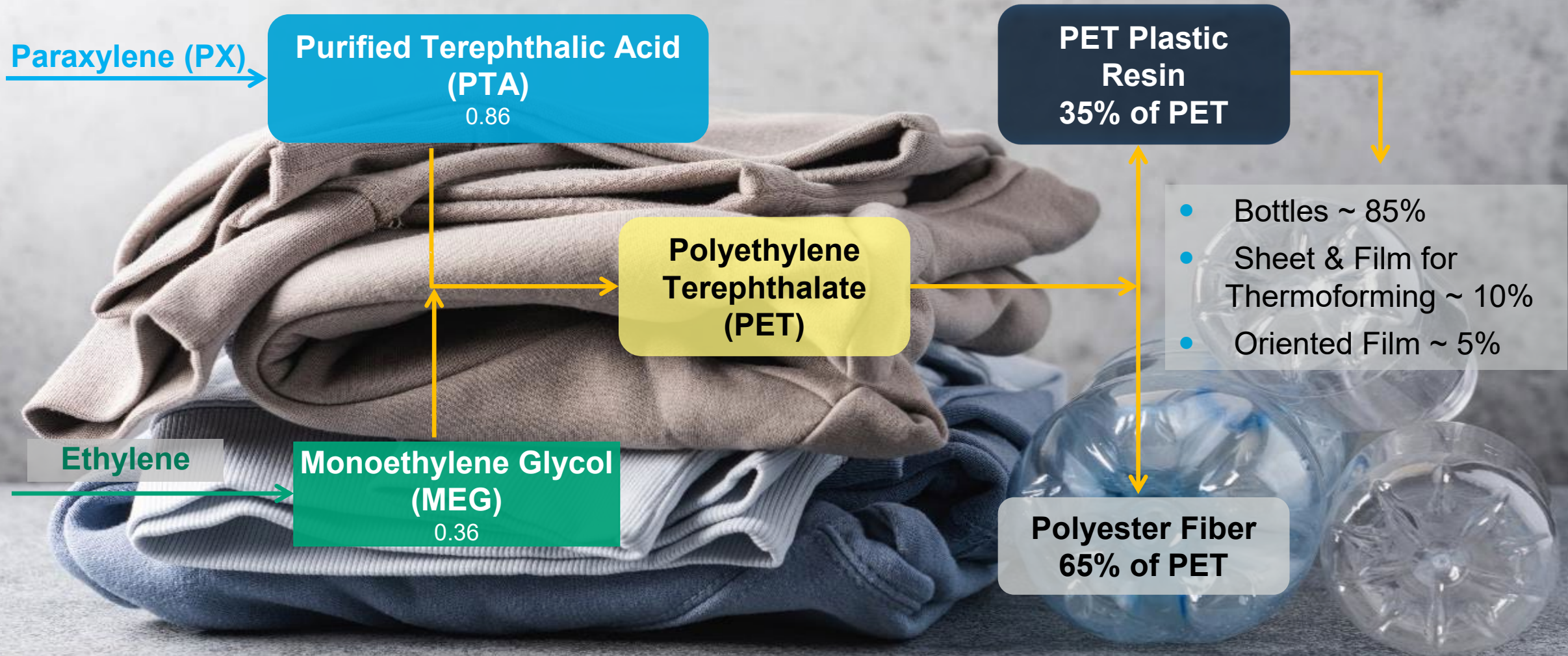
Bottles sold per year  
**~ 2.1 trillion**



Annual per capita consumption  
**260 units**

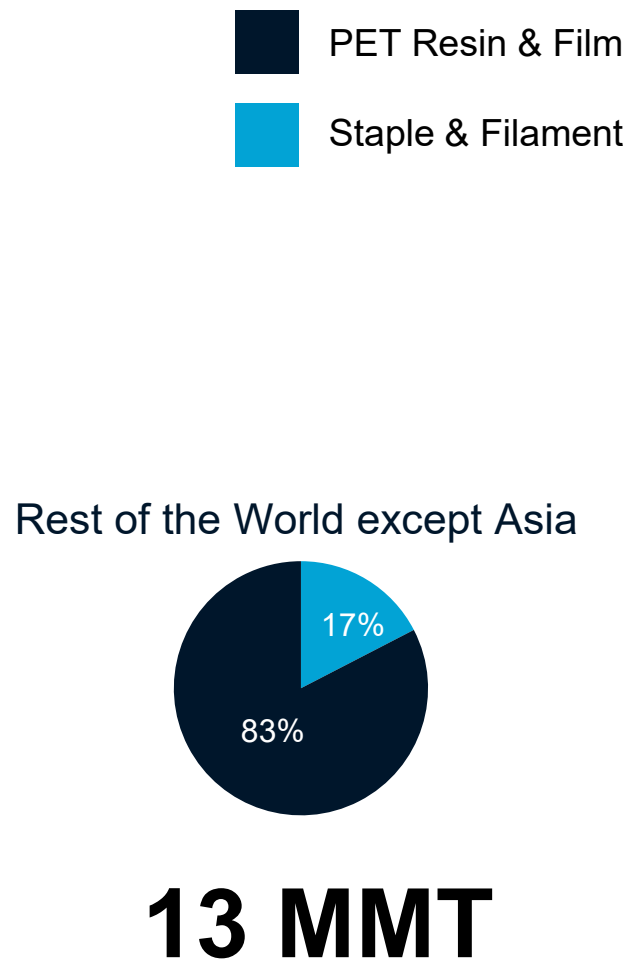
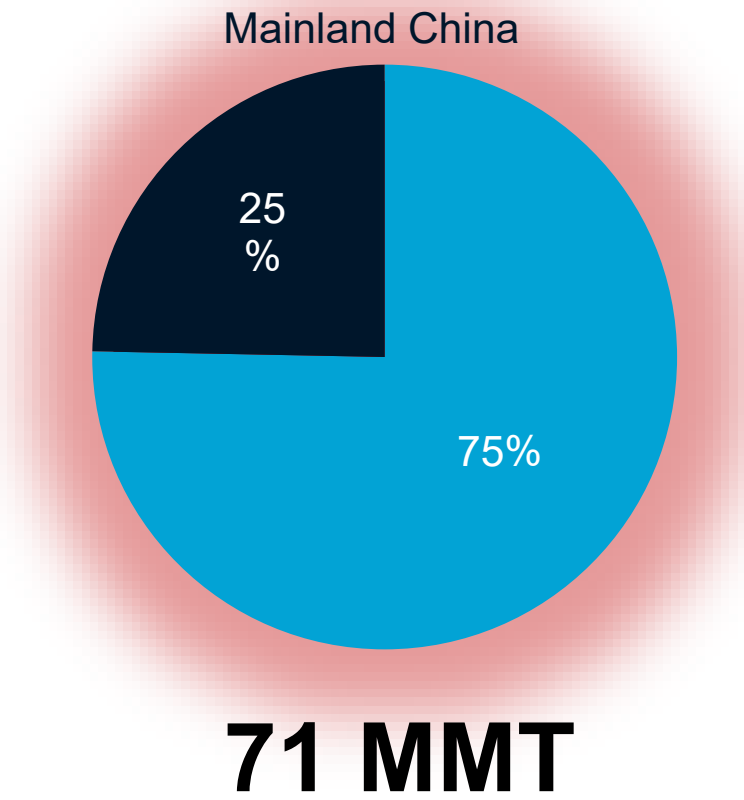
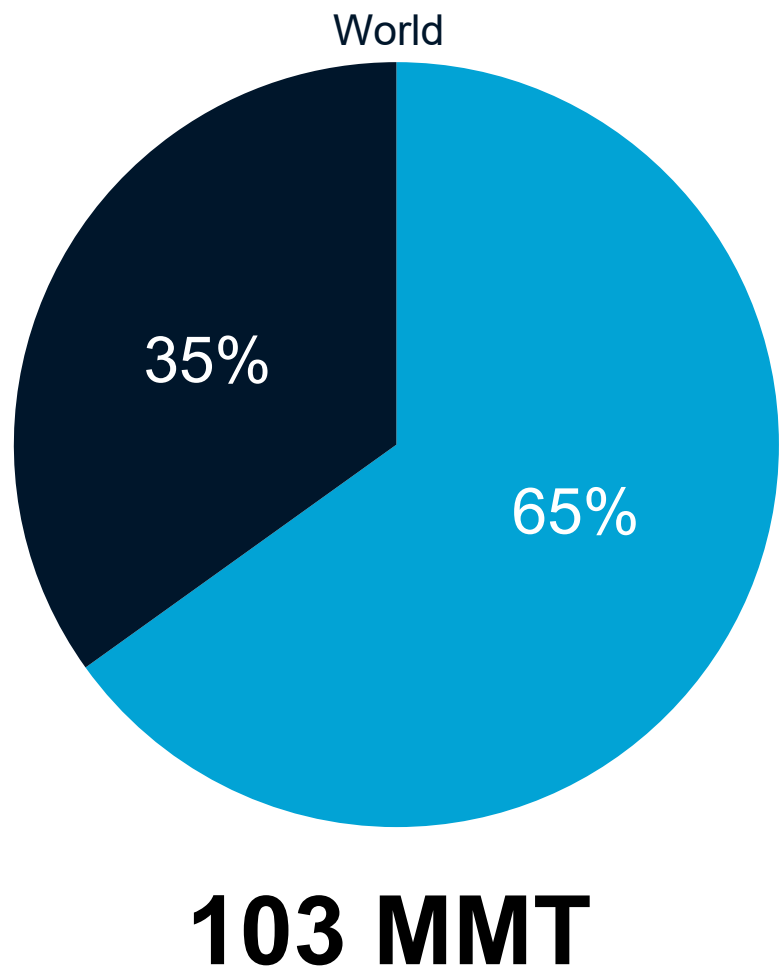


# Polyester chain - paraxylene chemical demand



Note: Percentages are approximate

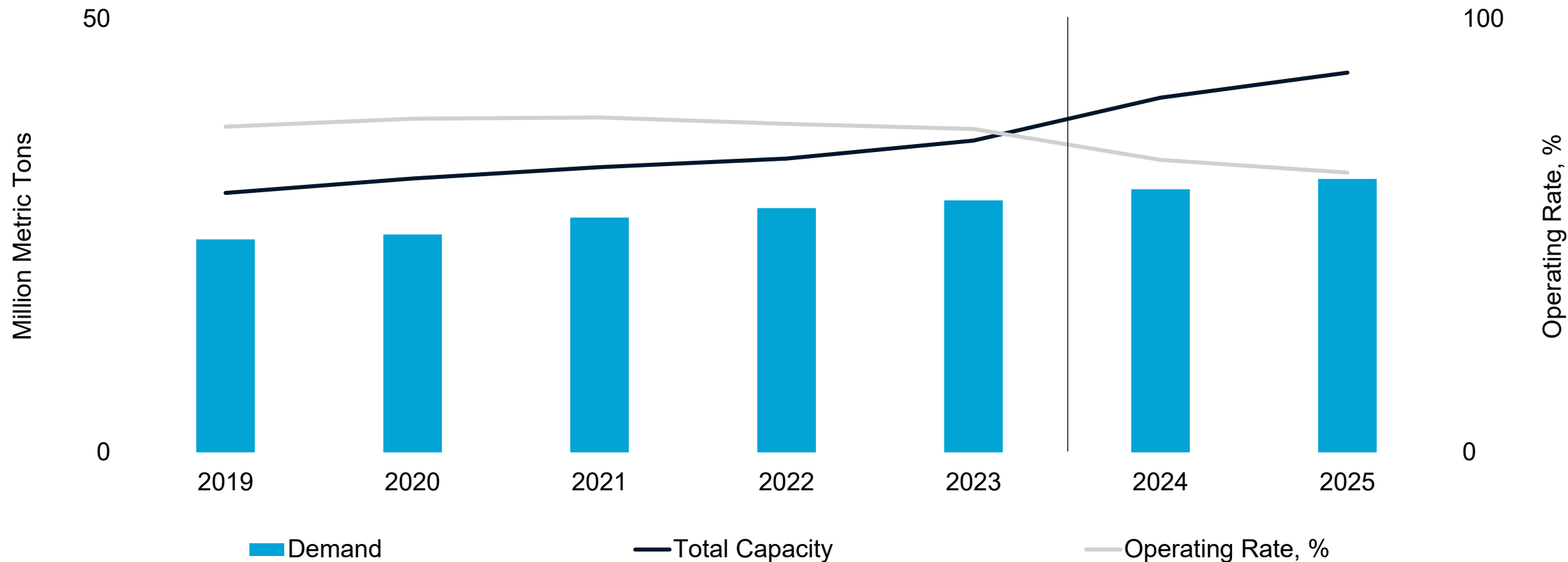
# Fibers dominate global and Asian polyester mix. Packaging segment is drawing global attention!





# World PET supply and demand

## World: PET Supply & Demand

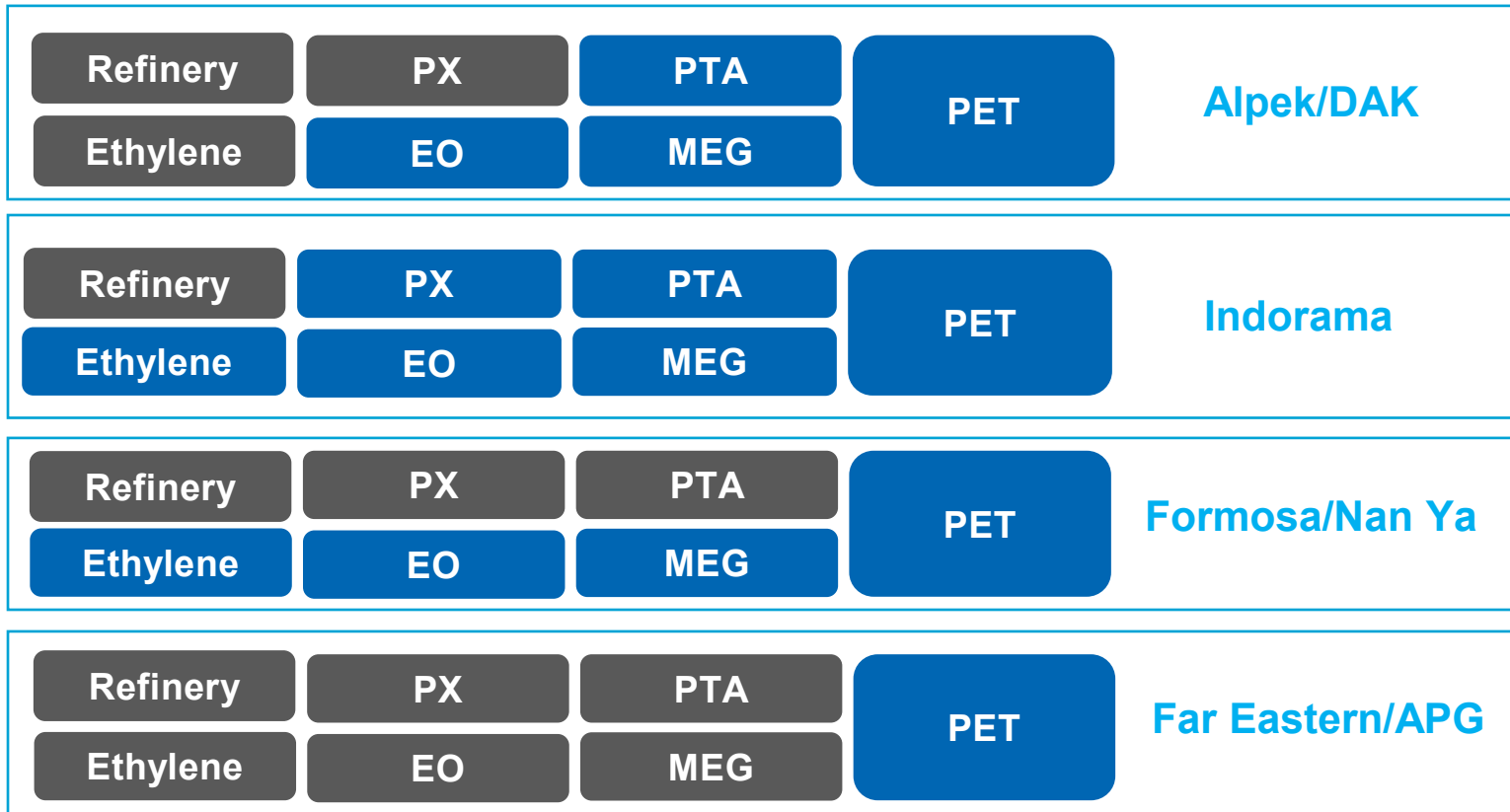


Source: Chemical Market Analytics by OPIS

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# PET Producers' Back Integrated in the United States

## North American Integration



### Legend

- Non-integrated
- Integrated

**1990's** – Nan Ya/Formosa Plastics builds US MEG

**2010** – Alpek buys PTA/PET Mexico

**2011** – M&G announces PTA/PET Corpus Christi, TX

**2012** – Indorama buys Old World MEG

**2016** – Indorama buys BP Decatur PX & PTA Assets, Cepsa PTA, idled Oxy steam cracker

**2016-2018** – DAK ethylene-to-MEG tolling at Huntsman

**2018** – DAK buys PQS Brazil PTA/PET

**2018** – Indorama buys M&G Brazil

**2019** – Indorama olefins operational

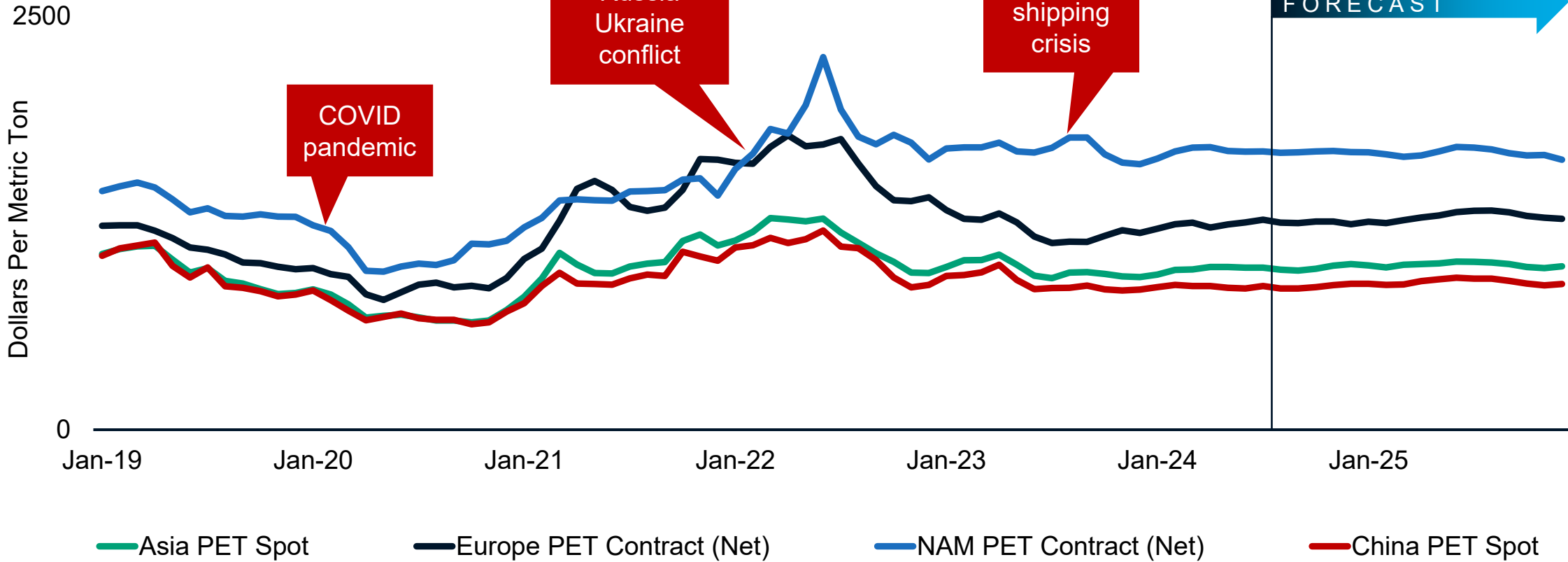
**20??** – Corpus Christi PTA & PET – three-way JV of Alpek, Indorama & Far Eastern

*Construction stopped in September 2023*

# Regional PET prices have diverged over the recent past

Impact of geopolitical events has varied regionally

PET Regional Prices

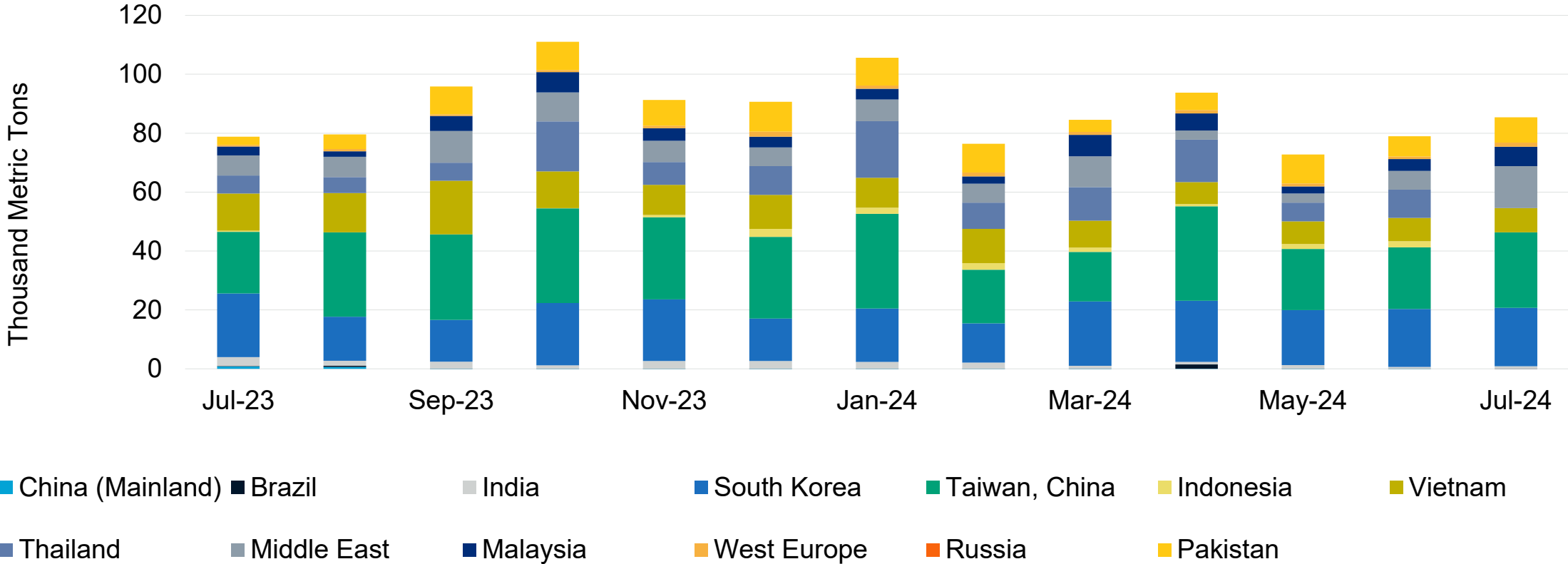


Source: Chemical Market Analytics by OPIS

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# United States PET imports

## US Non-USMCA PET Imports



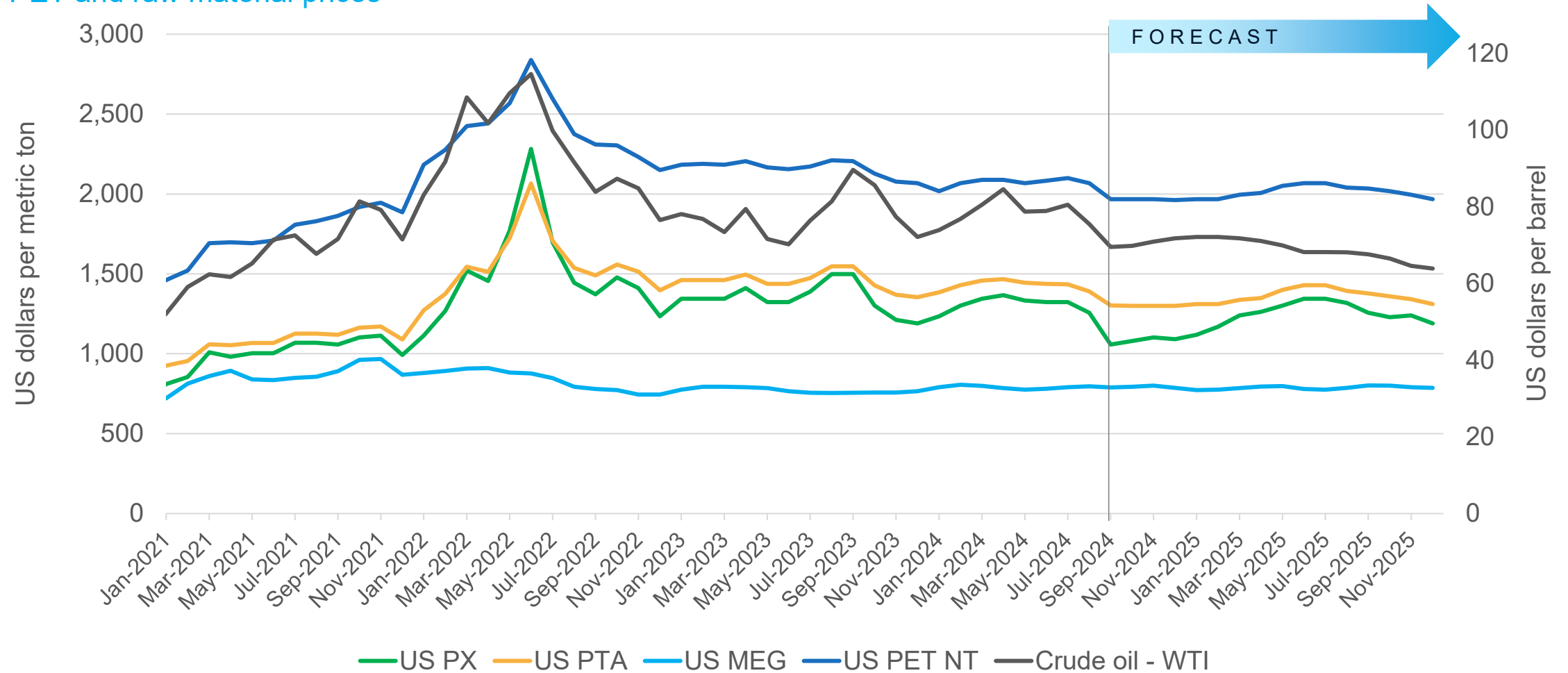
Notes: USMCA replaces NAFTA

Source: Chemical Market Analytics by OPIS

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# Short-term outlook for PET and raw material prices

PET and raw material prices



Source: Chemical Market Analytics

© 2024 Chemical Market Analytics by OPIS

# Sustainability



- March 2022, a historic resolution was adopted to develop an international legally binding instrument on plastic pollution, including in the marine environment.
- November 2022, formal negotiations for a UN treaty to end plastic pollution, began with the convening of an Intergovernmental Negotiating Committee (INC).
- November/December 2024, the ambition is to complete the negotiations for a UN treaty in Busan, S,Korea
- It is worth noting that for UN purposes, China is considered a developing economy, which means that its obligations under any agreement may not be as stringent as those required of the US and most European nations
- The agreement could impact the production and use of PS, PP and PET. It would require greater producer responsibilities associated with the ultimate disposal of items containing plastic.

# Polystyrene/EPS Bans Spread

## National Bans

- 68 countries

## United States

- 11-13 States

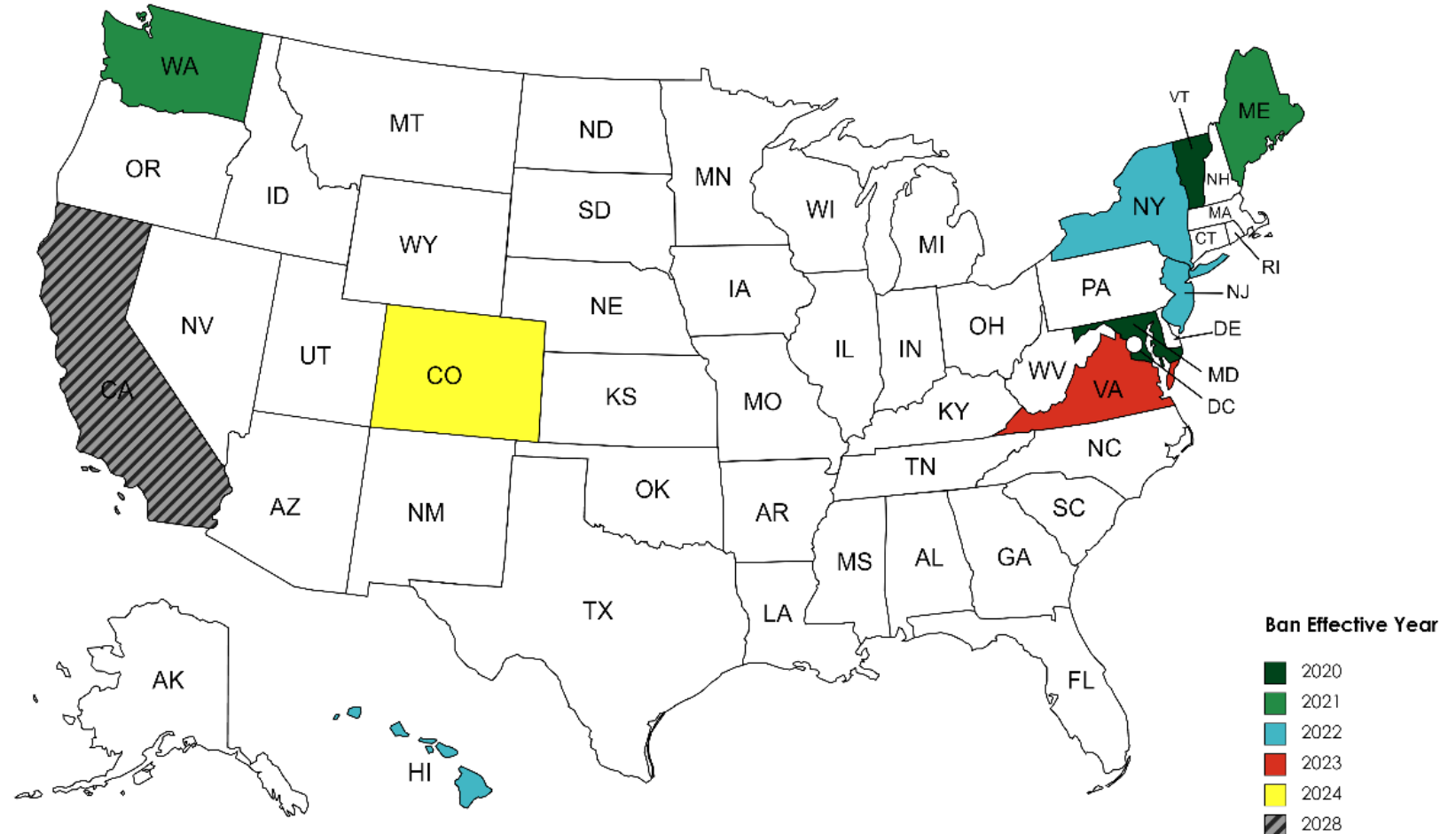
- 2 Territories

## Local Bans

## But

- Enforcement is uneven

- Focused on specific applications

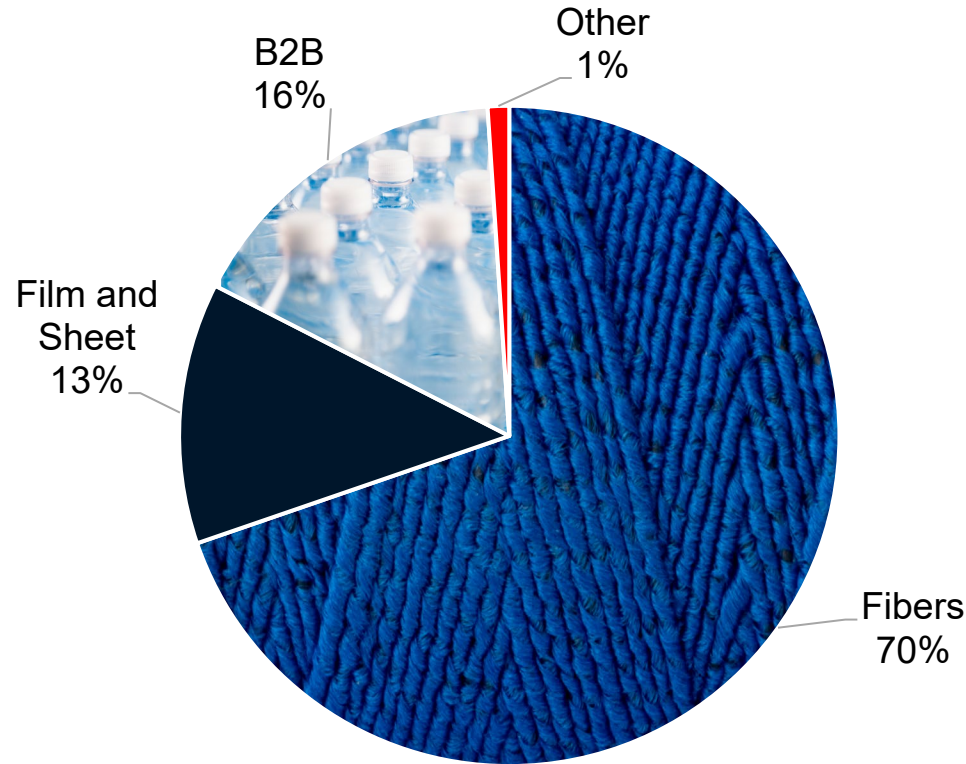




# PET waste is an important source for fibers production

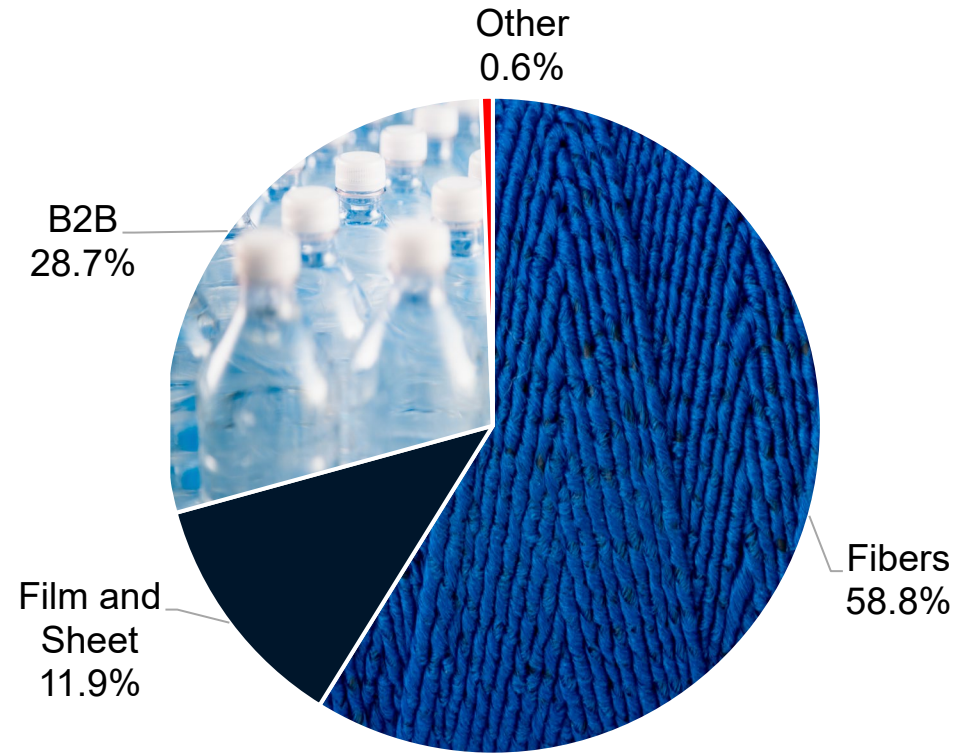
Regulations force faster growth in Bottle-to-Bottle (B2B) recycling

Global rPET Demand by Segment 2020



Domestic Demand: 7.3 Million ton

Global rPET Demand by Segment 2030



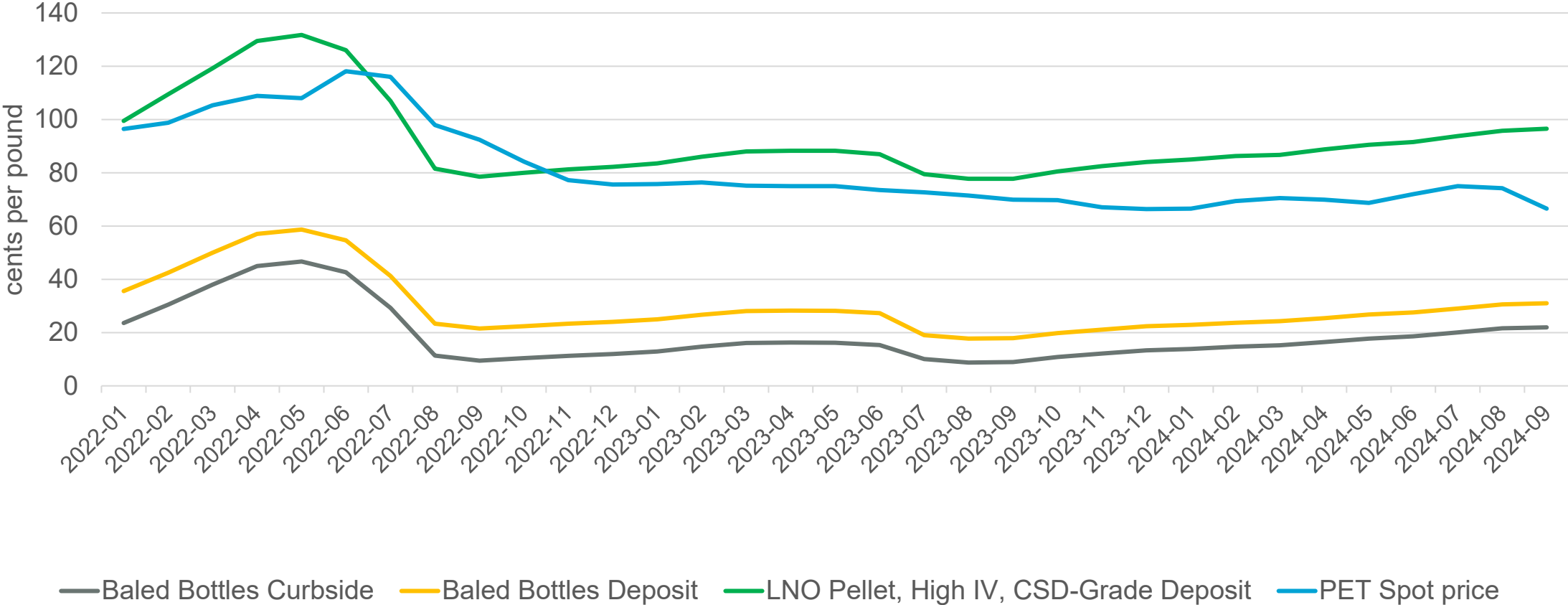
Domestic Demand: 14.5 Million ton

Source: Chemical Market Analytics by OPIS

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# Recycled PET Prices – United States

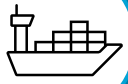
Virgin PET (spot price) x rPET



# Key takeaways



Petrochemical feedstocks availability increased with oil and gas production.



Supply chain disruptions continue to keep prices higher



PS markets have been disrupted by the derecho in the short term.



PP is oversupplied and margins have contracted.



Sustainability developments such as the UN Plastics Treaty should be carefully monitored.

CHEMICAL MARKET ANALYTICS

BY OPIS, A DOW JONES COMPANY

# Global Plastics Summit

25-27 February 2025, Houston, Texas

Embracing Agility Amid Dynamic Disruptions

Key topics to be covered include:

- How will industry leaders sustain business operations in response to global disruptions?
- What must be done to mitigate excess capacity through feedstock cost advantages and favorable freight rates?
- Will escalating geopolitical tensions impact global resin trade?



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