

Styrene Market Outlook

Preparing For Tomorrow's Styrenics Industry: Tackling The Impact Of Overcapacity

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Agenda

Introduction to Chemical Market Analytics

Feedstock Market Overview

Current Styrene Market

What to Prepare for the Future

Key Takeaways

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.

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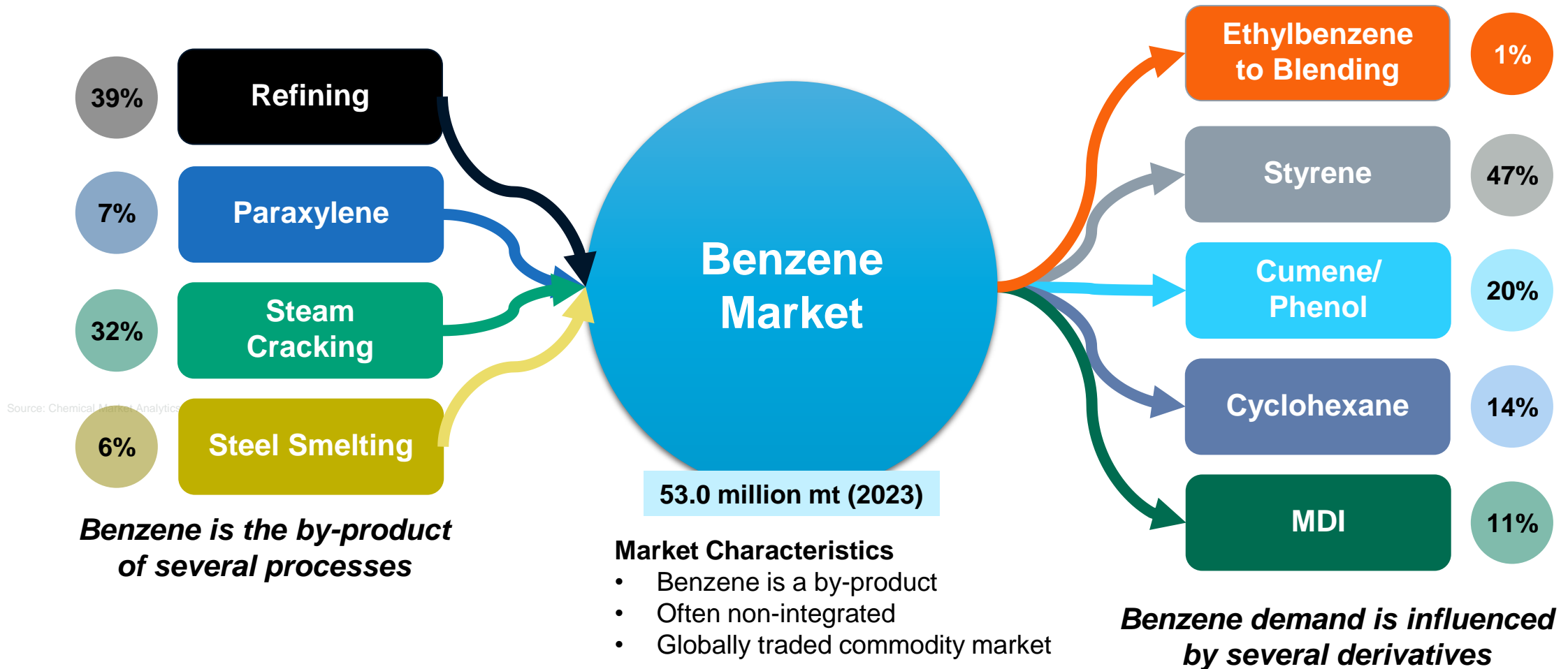
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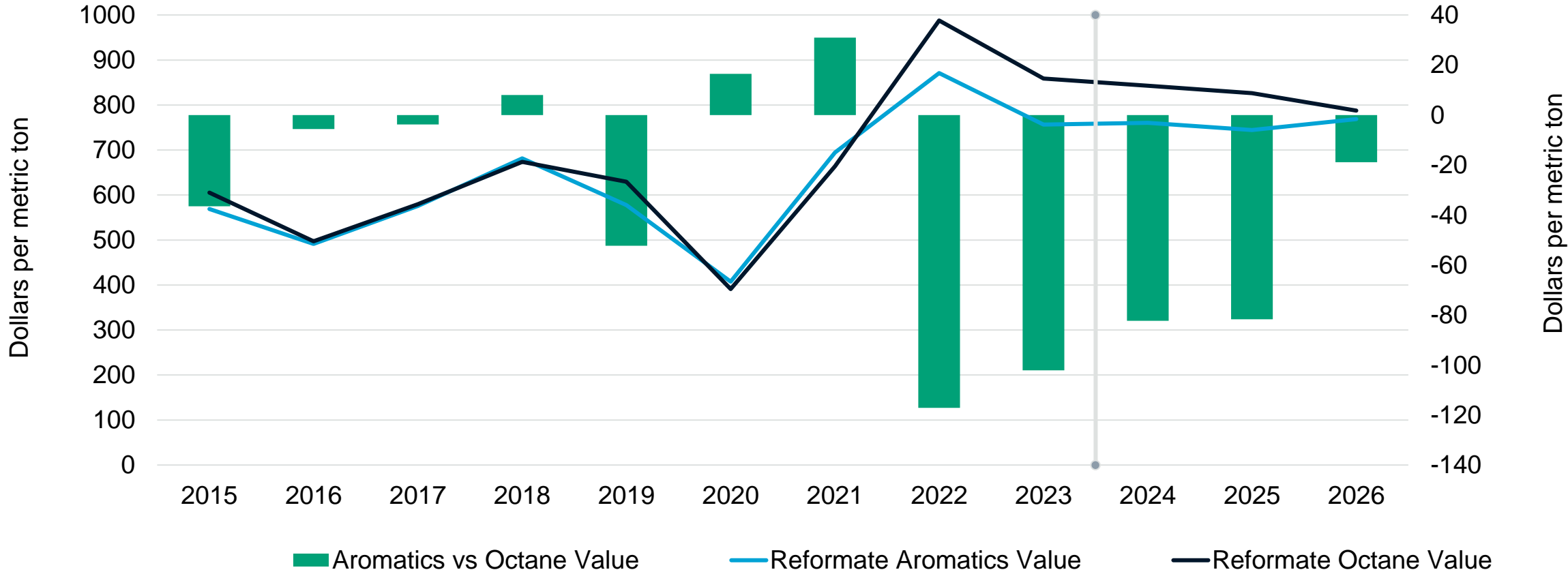
Feedstock Market Overview

The Benzene Market Is Complex With Multiple Supply Sources And A Myriad Of Demand Centers With Different Economic Drivers



Reformat's Aromatics Value Significantly Below Its Octane Value And Will Take Some Time Before Trend Can Be Reversed

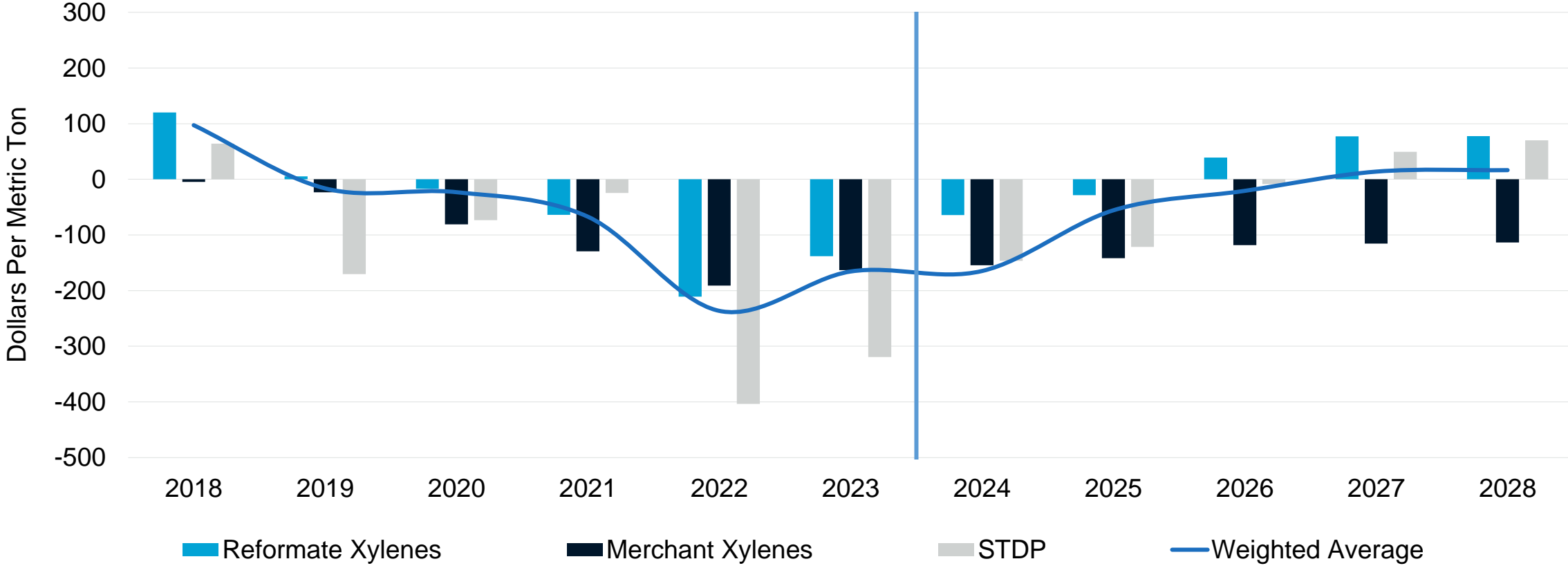
Asia Reformat Aromatics Vs Octane Value



Source: Chemical Market Analytics by OPIS

PX Margins Are Now In A Downturn And Expected To Remain Negative Over The Next Few Years

Asia PX margins by feedstock

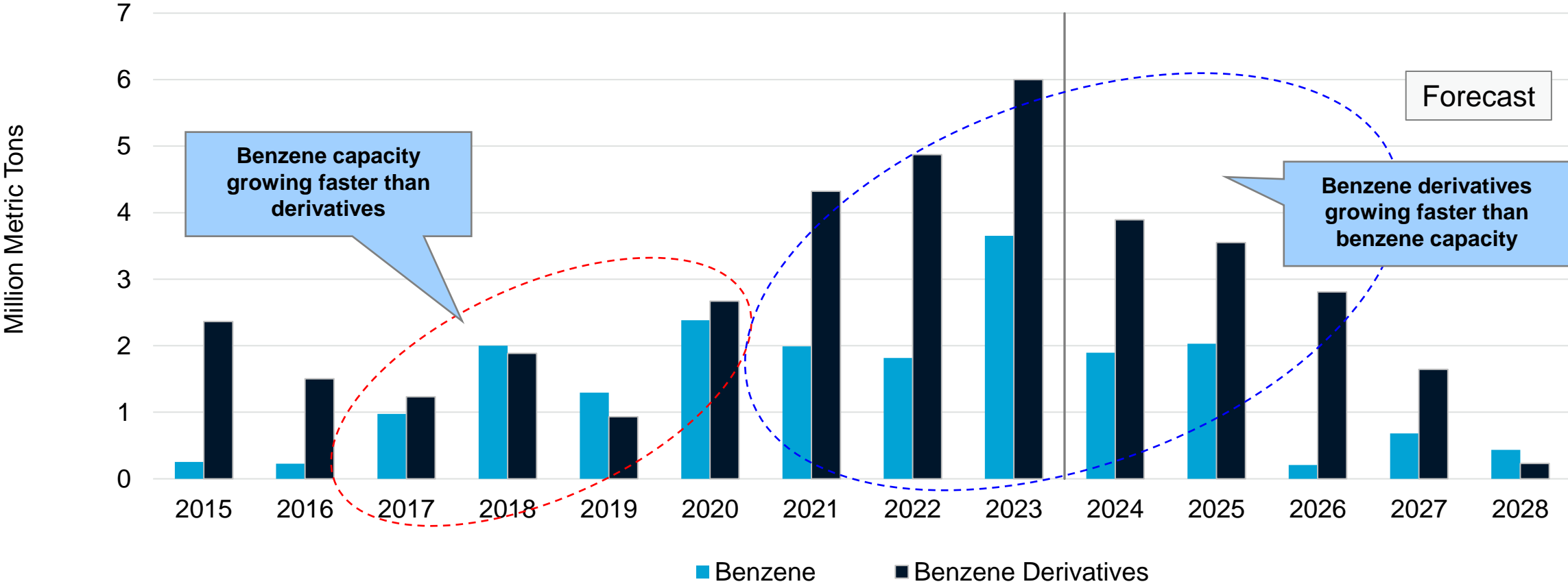


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Mainland China Benzene Demand Is Forecast To Be Strong With New Styrene, Phenol And Caprolactam Plant Expansions

Mainland China Benzene & Derivatives New Capacities

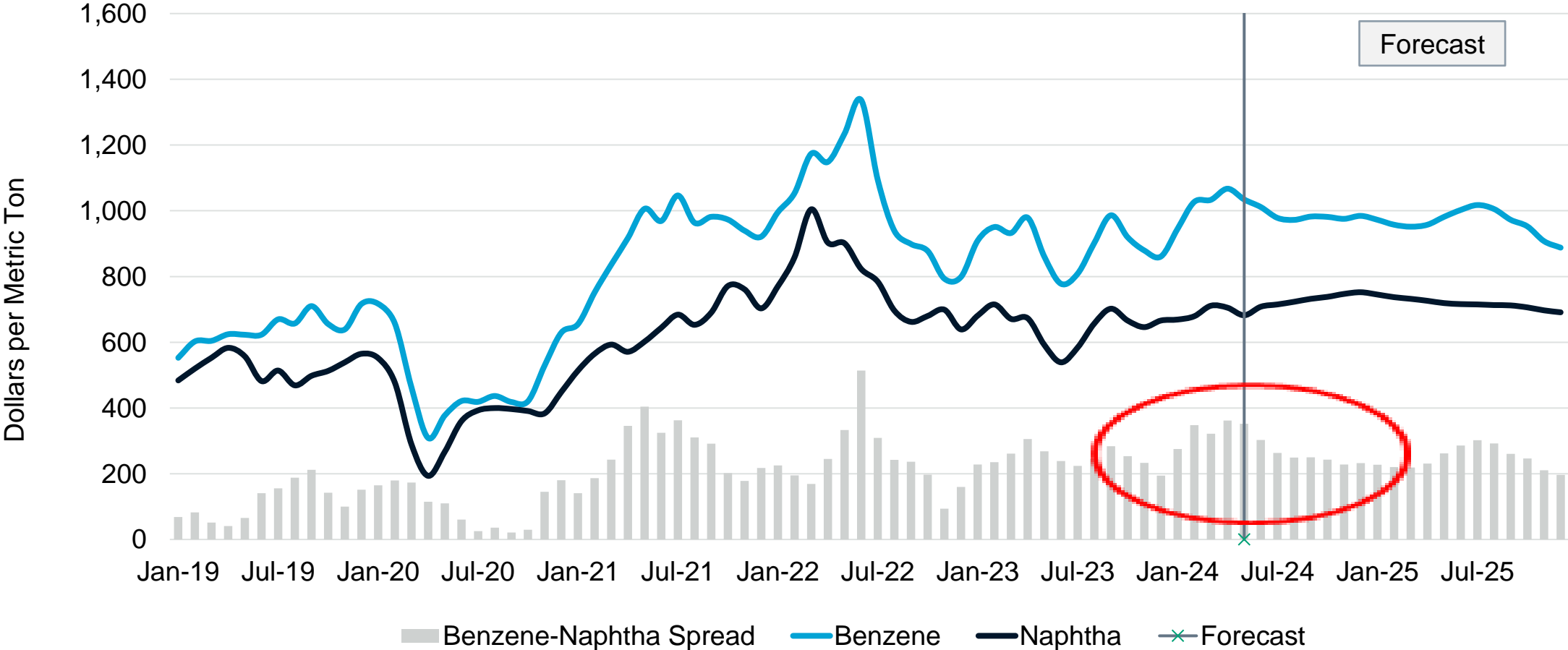


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Benzene Margins Will Remain Steady

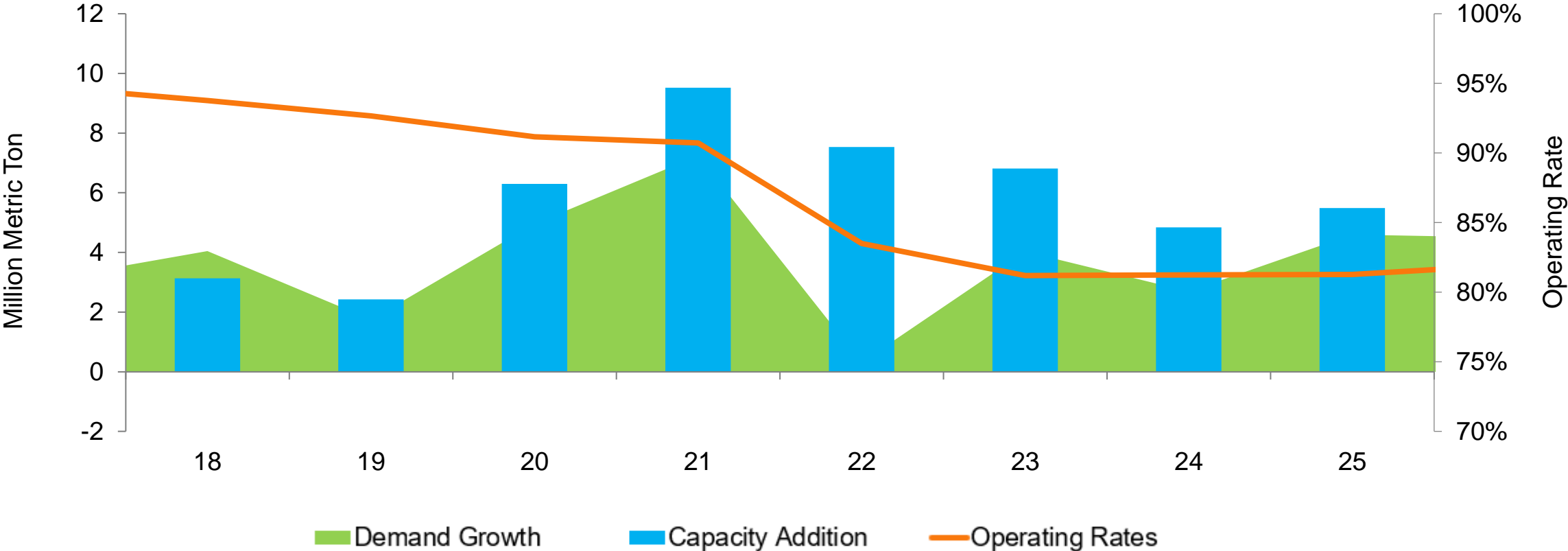
Asian Benzene vs Naphtha



Source: Chemical Market Analytics by OPIS

Fewer Capacity Addition During 2024-2025 In Asia

Asia Ethylene Supply Demand

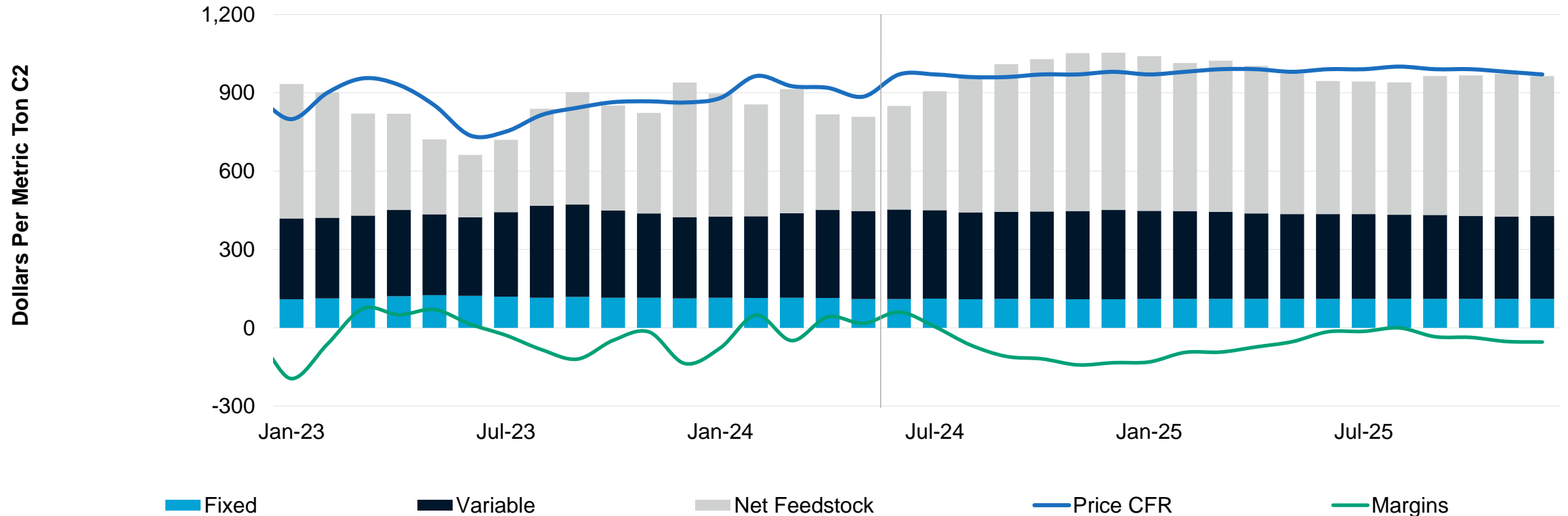


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Asia Cracker Margin To Remain Squeezed

NE Asia Integrated Naphtha Cracker (BDE/ BTX)



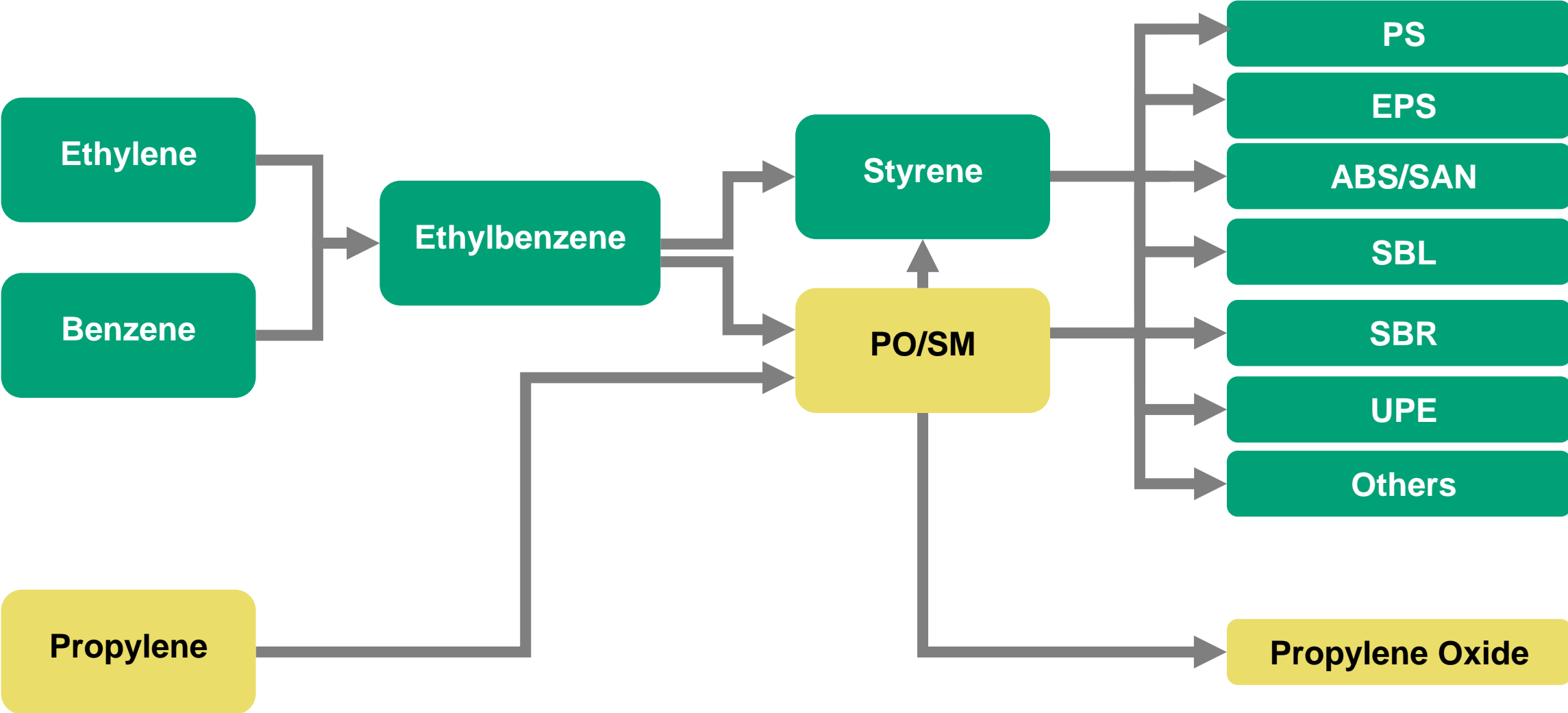
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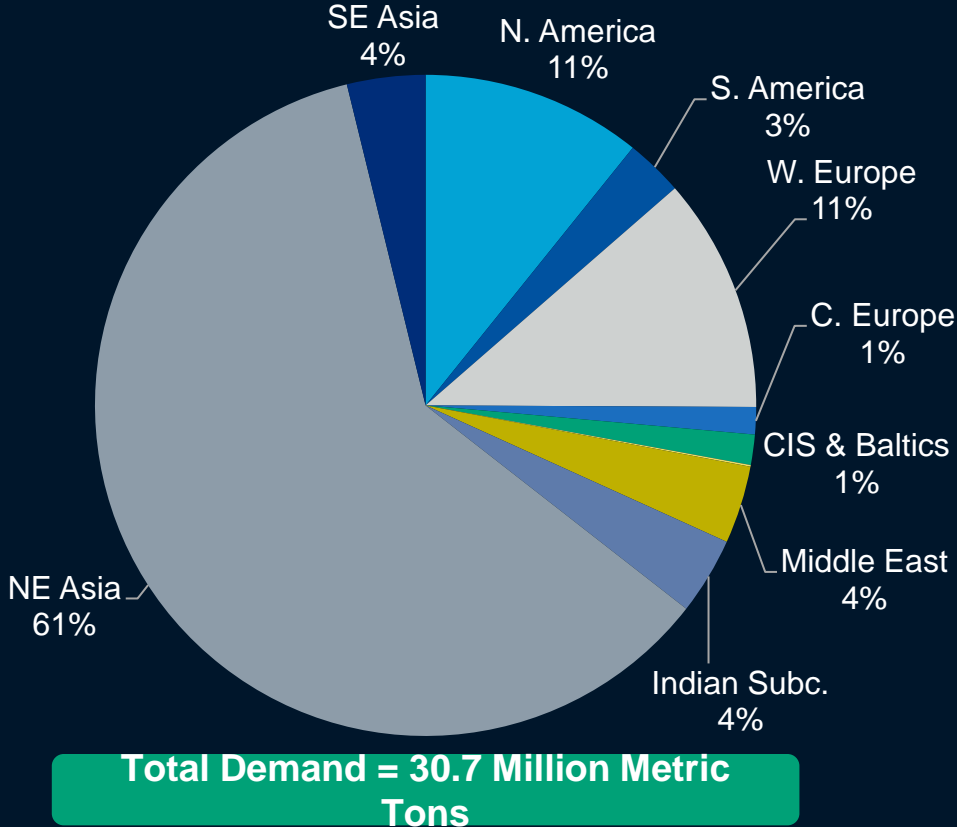
Current Styrene Market

Styrene Production And Consumption

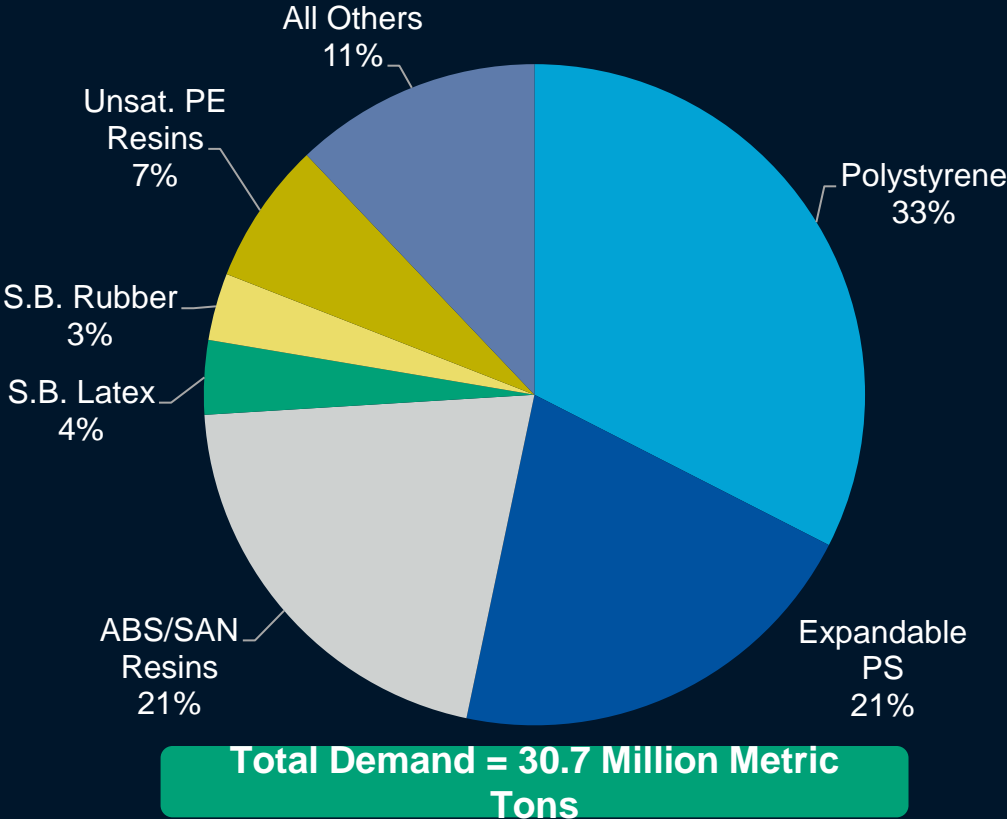


Styrene Demand Shifts To Asia And Away From PS

World: 2024 Styrene demand by region

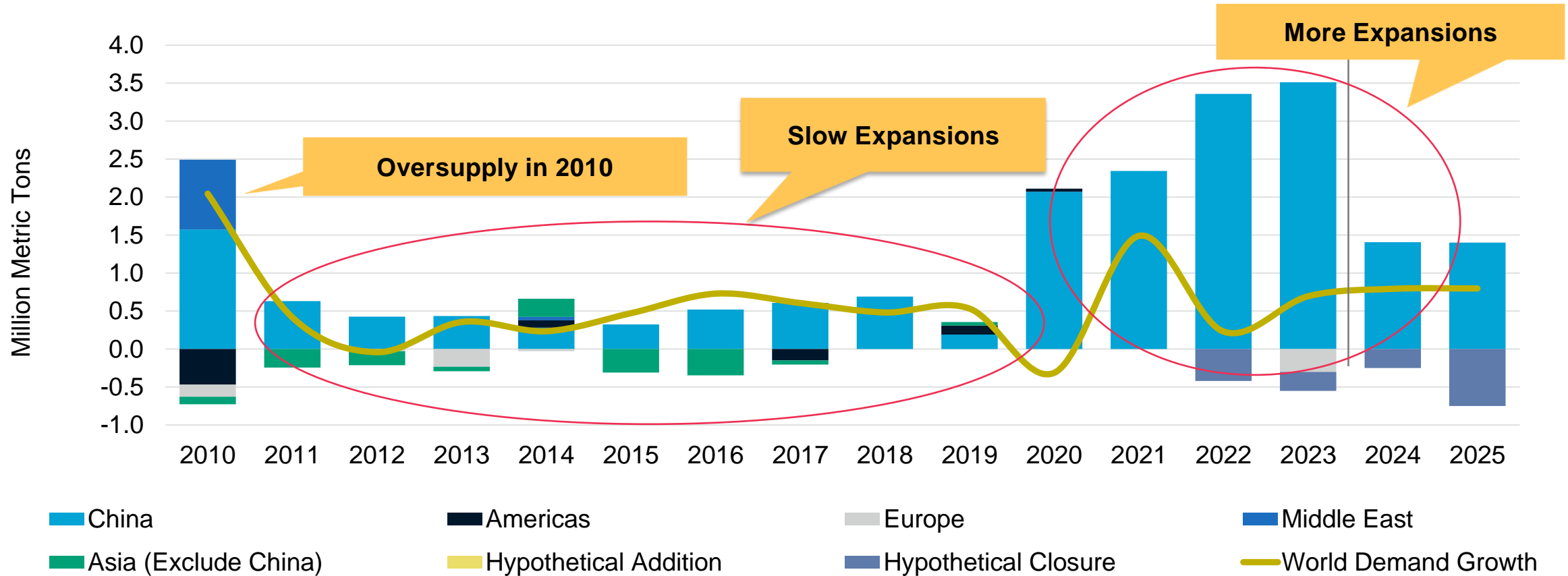


World: 2024 Styrene demand by derivative



Massive Capacity Expansions Led To A Longer Market

Capacity Expansions vs. Demand Growth

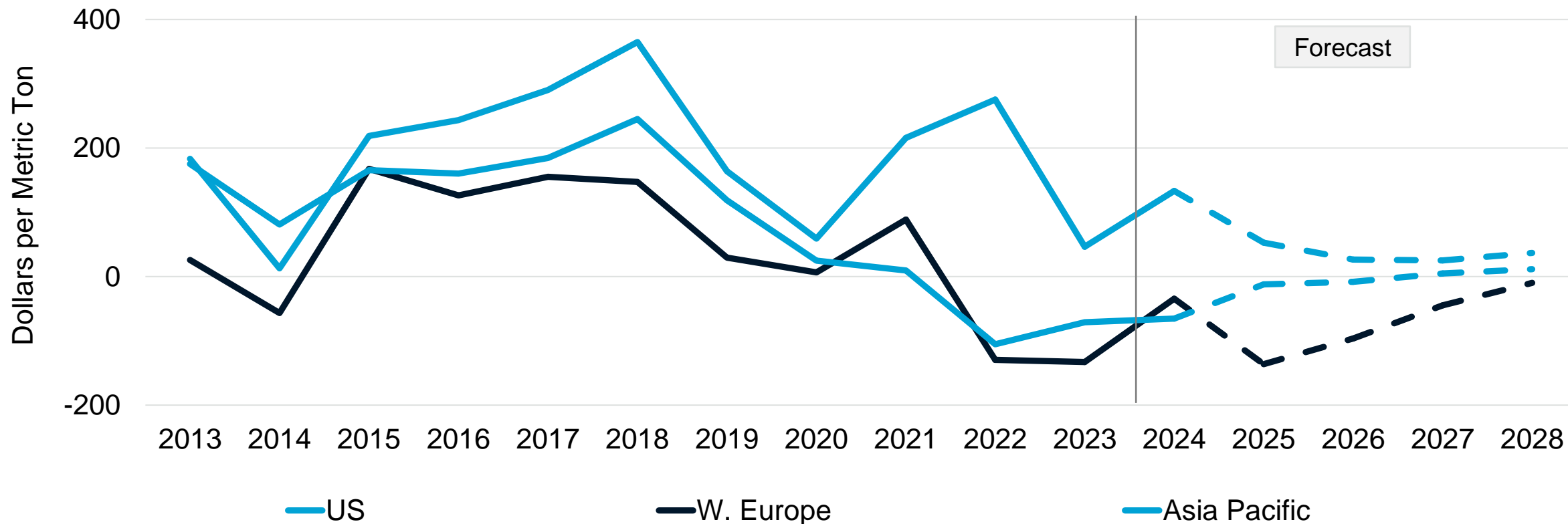


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Asian Margins Will Improve Slowly But Will Still Be Challenged For The Next Few Years

Styrene Spot Margins



Source: Chemical Market Analytics by OPIS

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Key Unique Characteristics In Every Region And Rationalization

West Europe

- Cost disadvantaged
- Stagnant demand growth
- Competition from imports
- Single Use Plastics ban

Mainland China

- Many small plants without feedstock
- Severe competition with new capacities and imports
- + Stronger demand growth

North America

- Net long balance
- Stagnant demand growth
- + Cost competitive

Middle East

- Net long balance
- + Cost advantaged
- + Steady export demand

Northeast Asia (ex China)

- Net long balance
- Cost disadvantaged
- Slow demand growth

Southeast Asia

- Net long balance
- Cost disadvantaged
- Slow demand growth

No.	Name	Location	Capacity	Startup	Status
1	Abel	Taixing, China	250	Jan, 2021	Stop operation
2	Donghao	Changzhou, China	210	Oct, 2021	Permanent Closure
3	LG Chemical	Daesan, Korea	170	Oct, 2021	Permanent Closure
Total in 2021			630		
4	Sinopec Maoming	Maoming, China	100	Jun, 2022	Stop operation
5	Trinseo	Boehlen, Germany	300	July, 2022	Stop operation
6	Taiyo	Ube, Japan	370	Nov, 2022	Stop operation
Total in 2022			770		
7	LG Chemical	Yeosu, Korea	200	May, 2023	Stop operation
8	Trinseo	Terneuzen, Netherland	500	Nov, 2023	Stop operation
Total in 2023			700		
9	LG Chemical	Yeosu, Korea	300	Mar, 2024	Stop operation
Total in 2024			300		

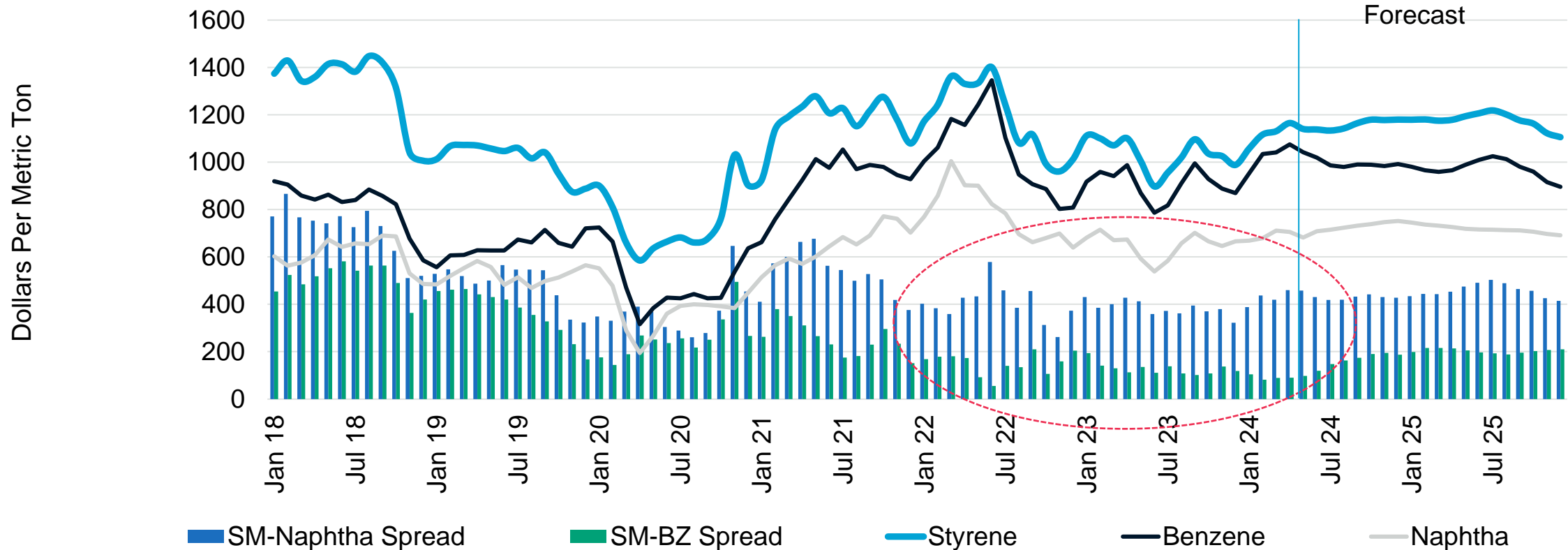


What To Prepare For The Future

Need flexible operation depending on feedstock prices and margin

Asian Styrene Margins Have Declined In 2H 2021 And Have Remained Negative Thereafter

Asia Benzene/Styrene with Upstream Prices

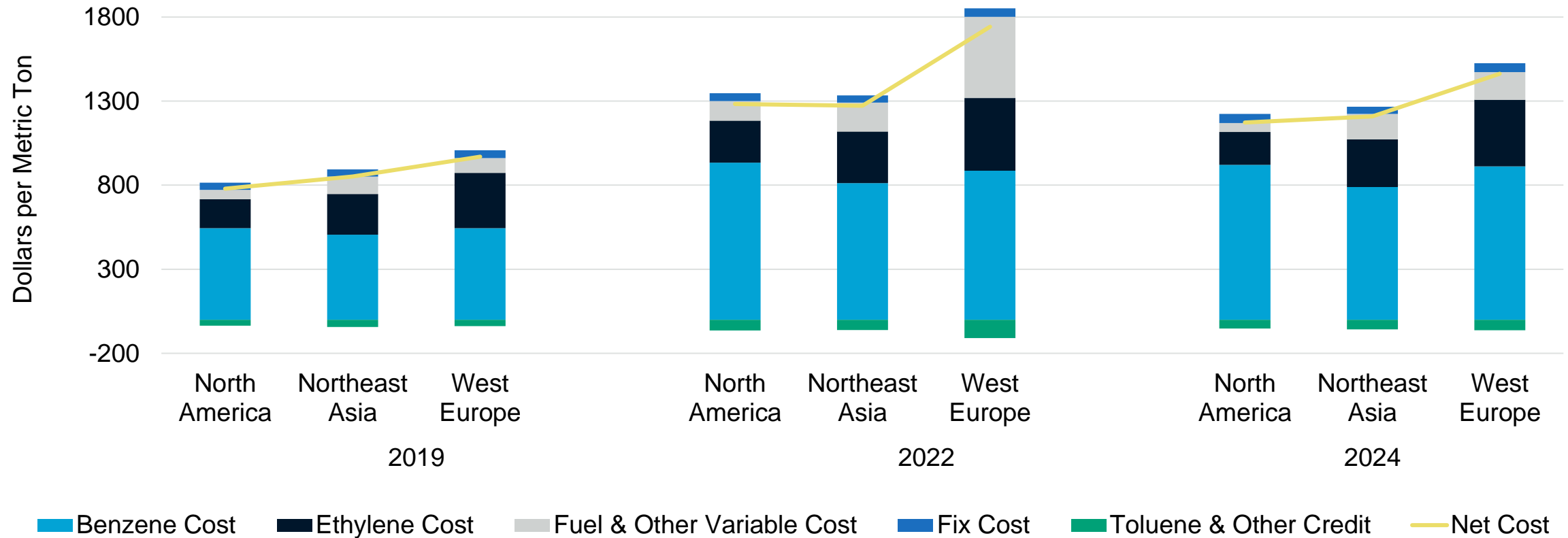


Source: Chemical Market Analytics by OPIS

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European Cost Structure Is Significantly Disadvantaged And NAM Cost Advantage Declines

Styrene Cost Comparison Across Regions



Source: Chemical Market Analytics by OPIS

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What drives higher operating rates ?

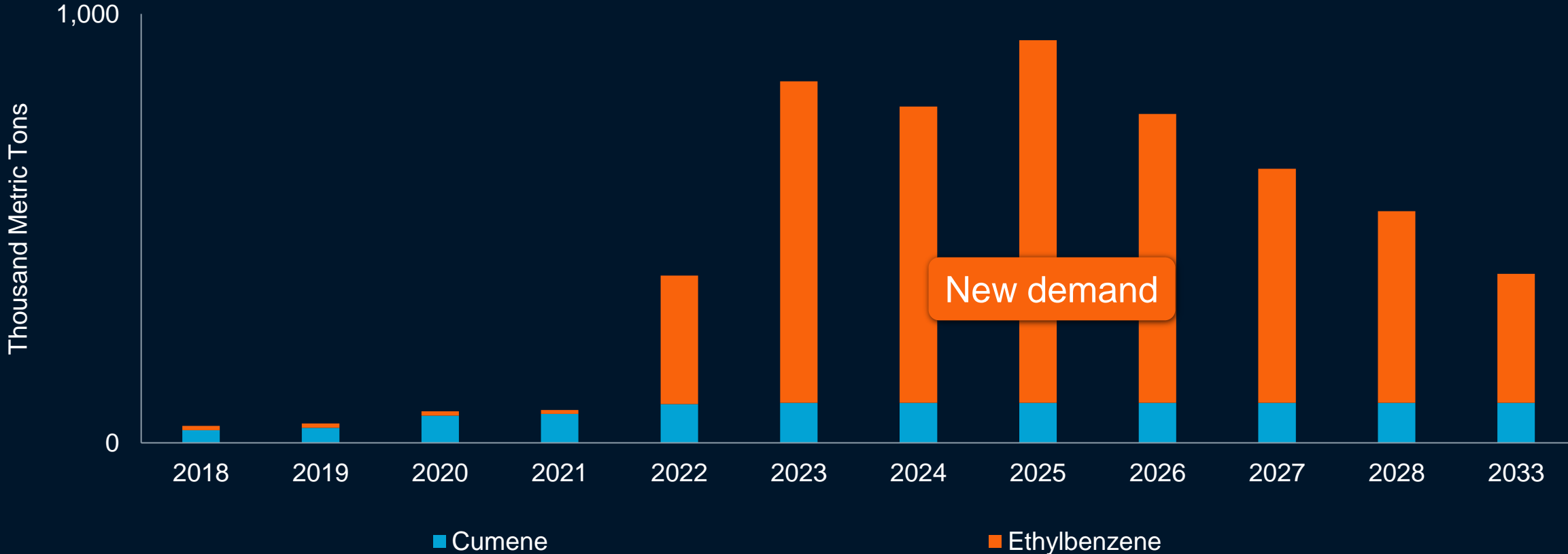
- Lower operating cost
- Keep sales market share
- Utilize internal feedstock (EL)
- Opportunity of spot export

Why lower operations?

- Minimize loss amid negative margins
- Sales of feedstock (Benzene)
- Considering coproduct market (PO)
- Opportunity of EB sales

Traders And Blenders Discovered Ethylbenzene (EB) As An Advantaged Octane Source

NAM cumene and ethylbenzene into the gasoline blend pool



Source: Chemical Market Analytics by OPIS

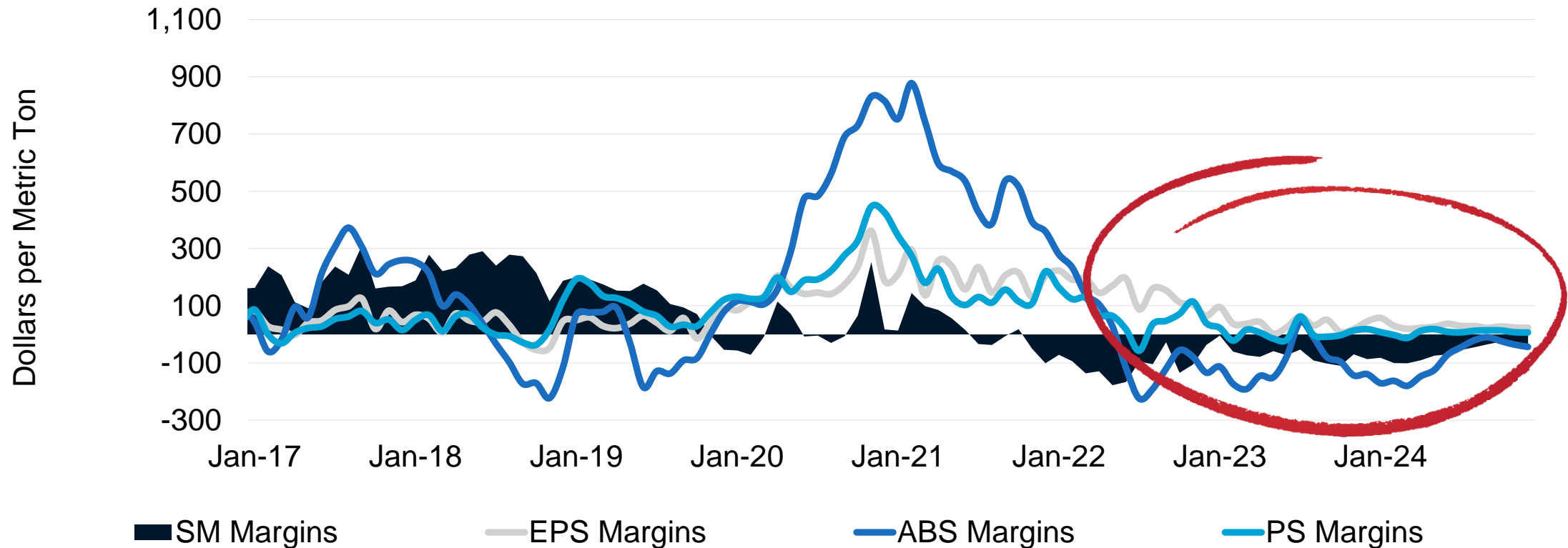


What To Prepare For The Future

Will integration with feedstock and derivatives be helpful for optimization of economics ?

Styrene Margins Have Been Negative Since 2022 While Polymer Margins Fluctuated

Northeast Asia: Styrenics Margins

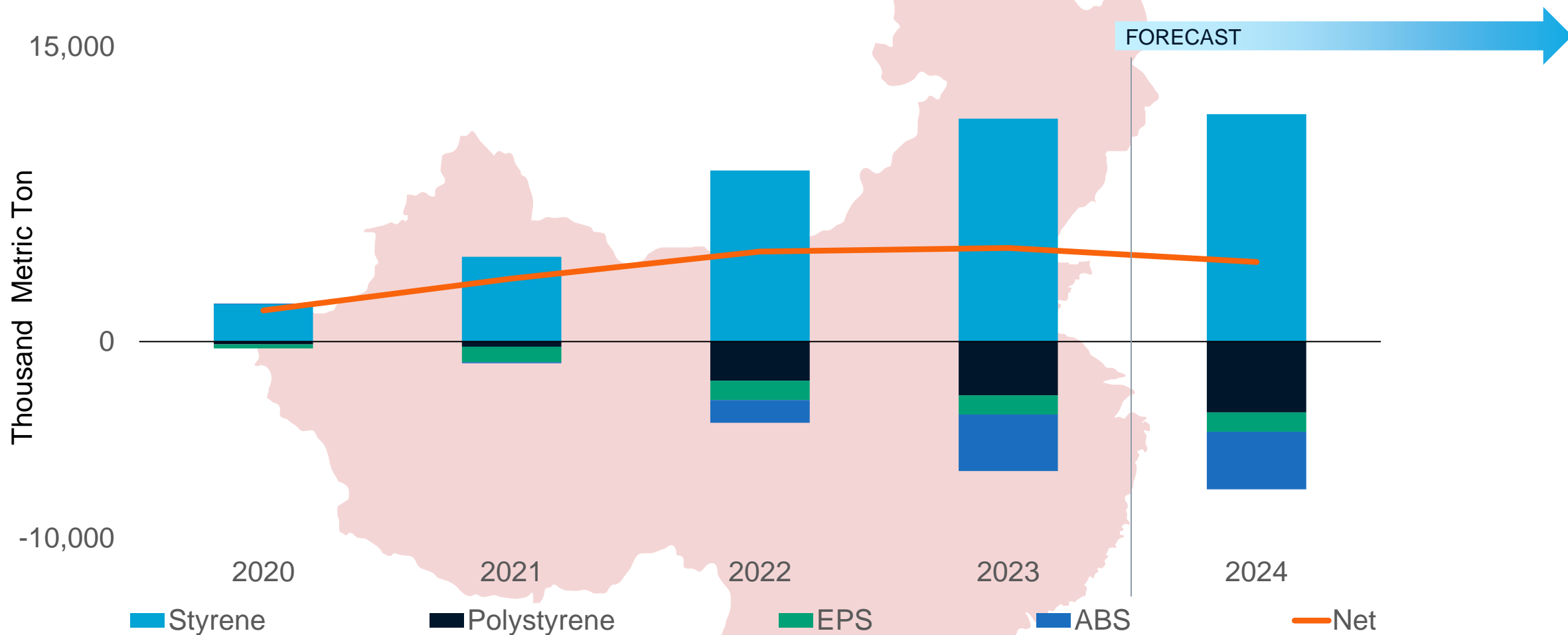


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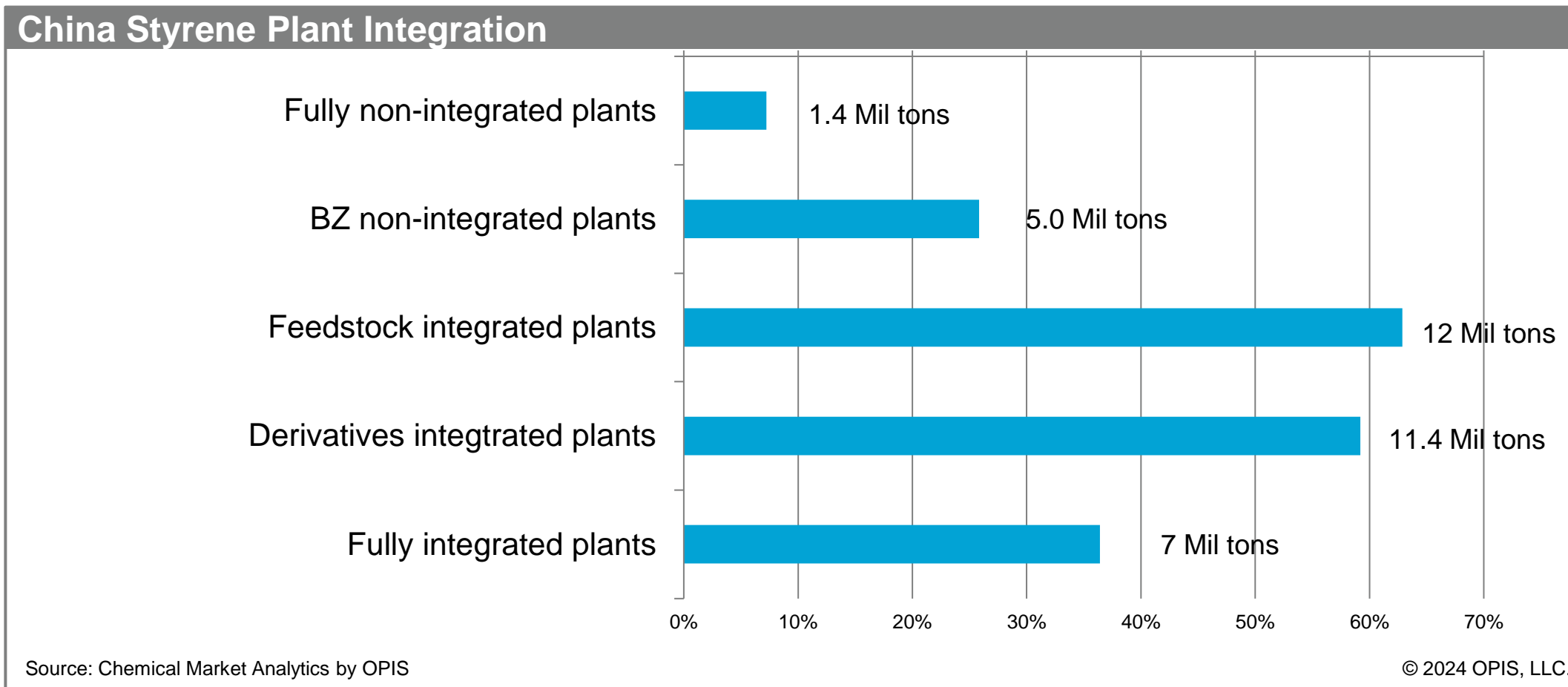
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China Adds A Huge Wave of Styrene And Derivatives

Mainland China's net styrene capacity expansion



Source: Chemical Market Analytics by OPIS



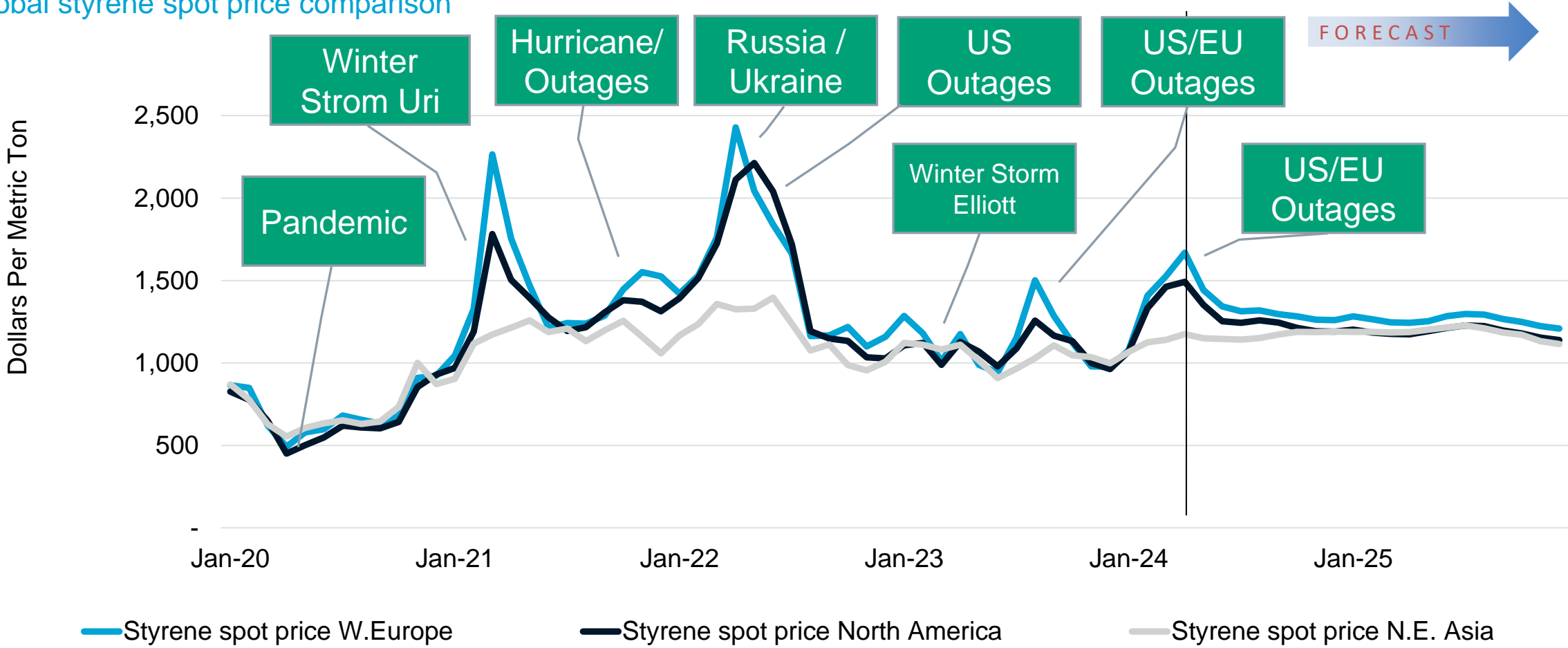


What To Prepare For The Future

Prices and margins of each region and country will fluctuate

Price Differences Between The East Vs West

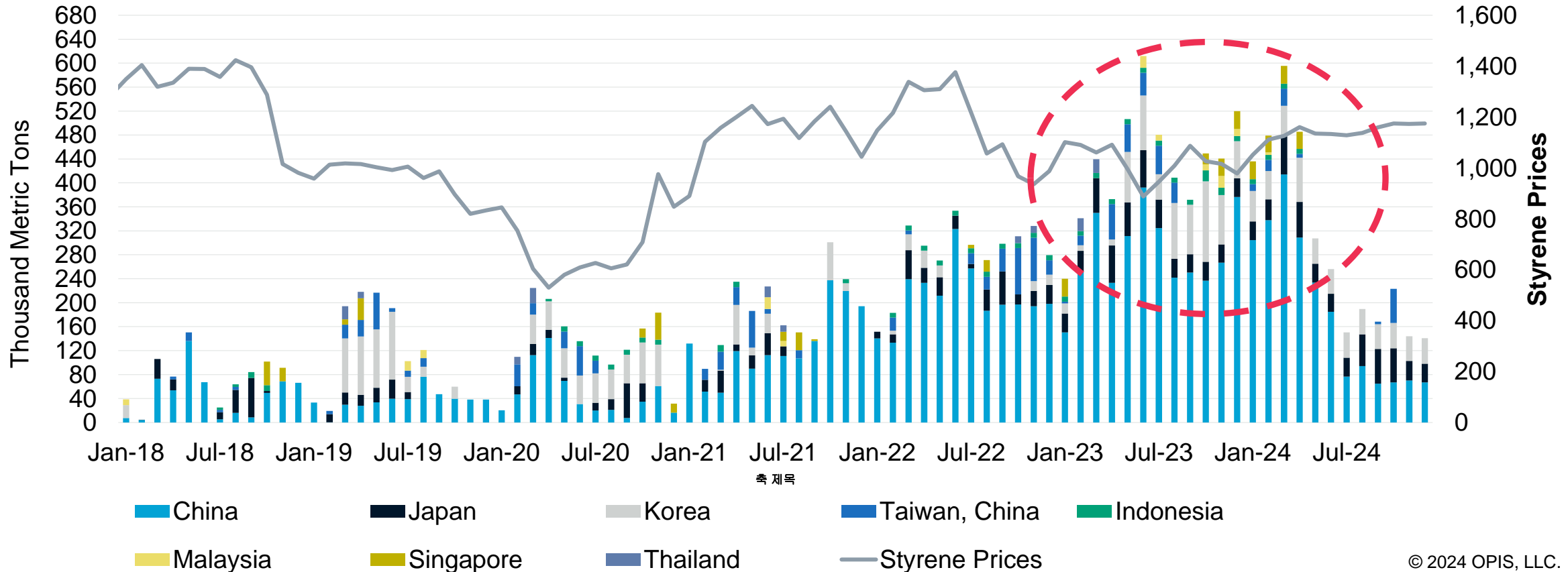
Global styrene spot price comparison



Source: Chemical Market Analytics by OPIS

Higher Outages Due To Voluntarily Production Cuts And Unplanned Shutdowns Which Will Lead To A Different Balance Of Each Country

Asia Styrene Production Capacity Losses 2018-2024



Source: Chemical Market Analytics by OPIS

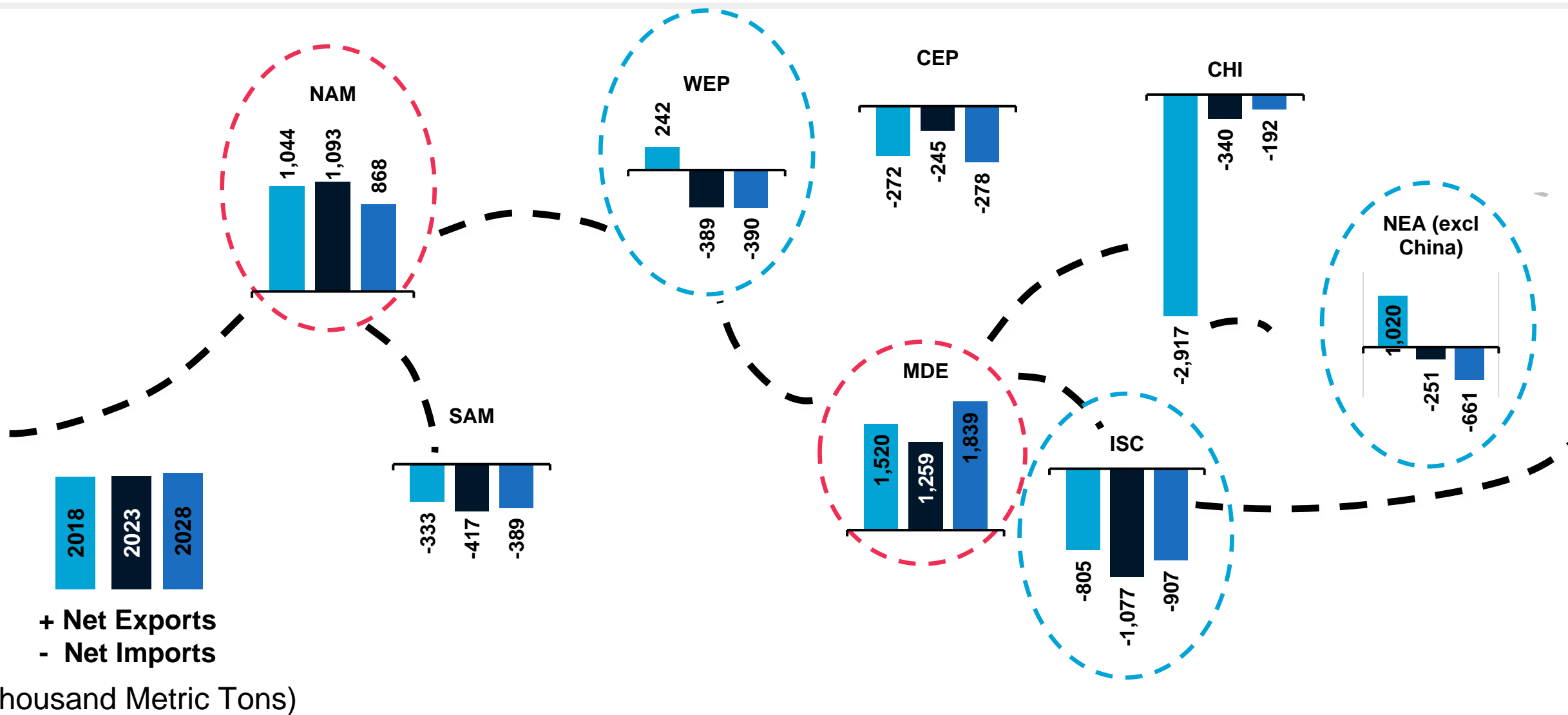
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What To Prepare For The Future

Need new strategy for sales with changing trade structure and increasing trade barriers

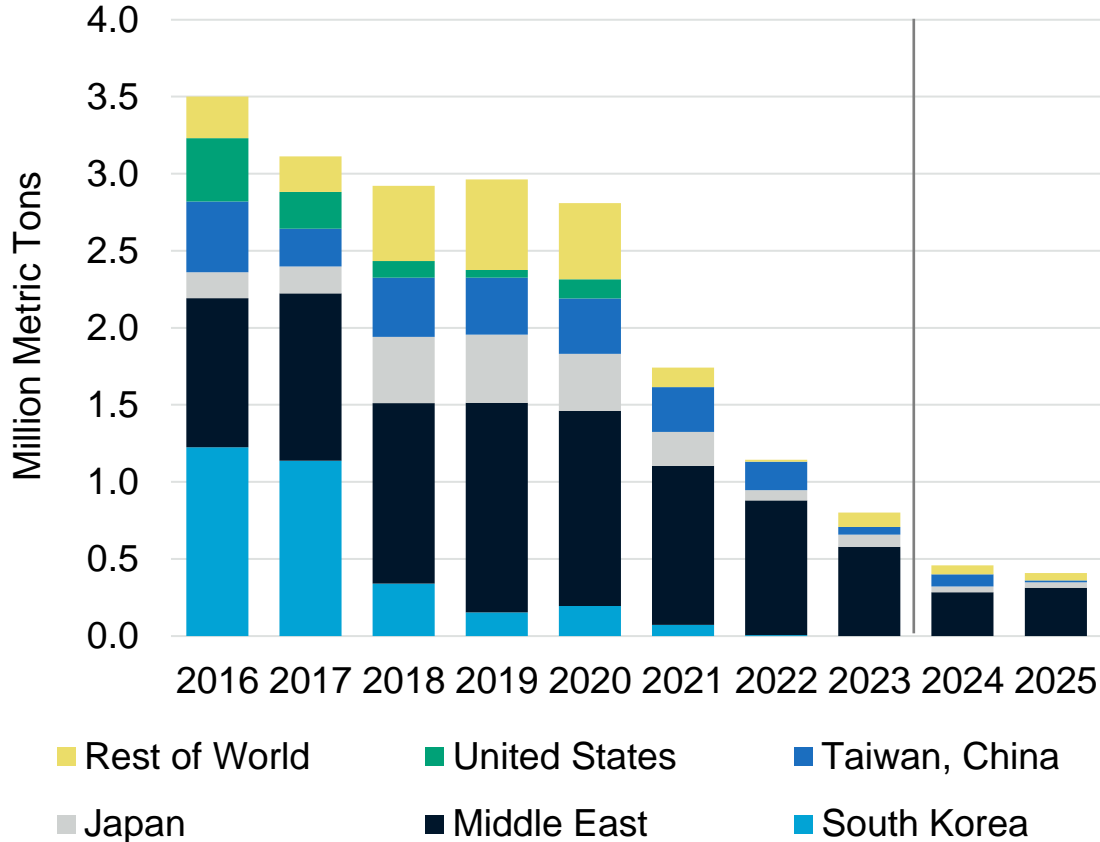
What Happens When The World's Largest Importer Reduces Imports?



Increasing Trading Barriers With ADD And Logistics Constraints

- ❑ After Chinese ADD to South Korea, Taiwan, China and USA from 2018, Imports from:
 - Middle East and Japan have increased
 - South Korea and USA have declined sharply as sellers target domestic sales or diversified exports
 - Under review for extension of ADD (June 2024)
- ❑ South Korea started ADD investigation on imports from mainland China in April 2024
 - Preliminary result will be known by July-Sep 2024
- ❑ Logistic constraints
 - Higher freight and limited vessels
 - Congestion in Panama Canal
 - Disruption in Red sea area

Mainland China Styrene Imports



Source: Chemical Market Analytics by OPIS

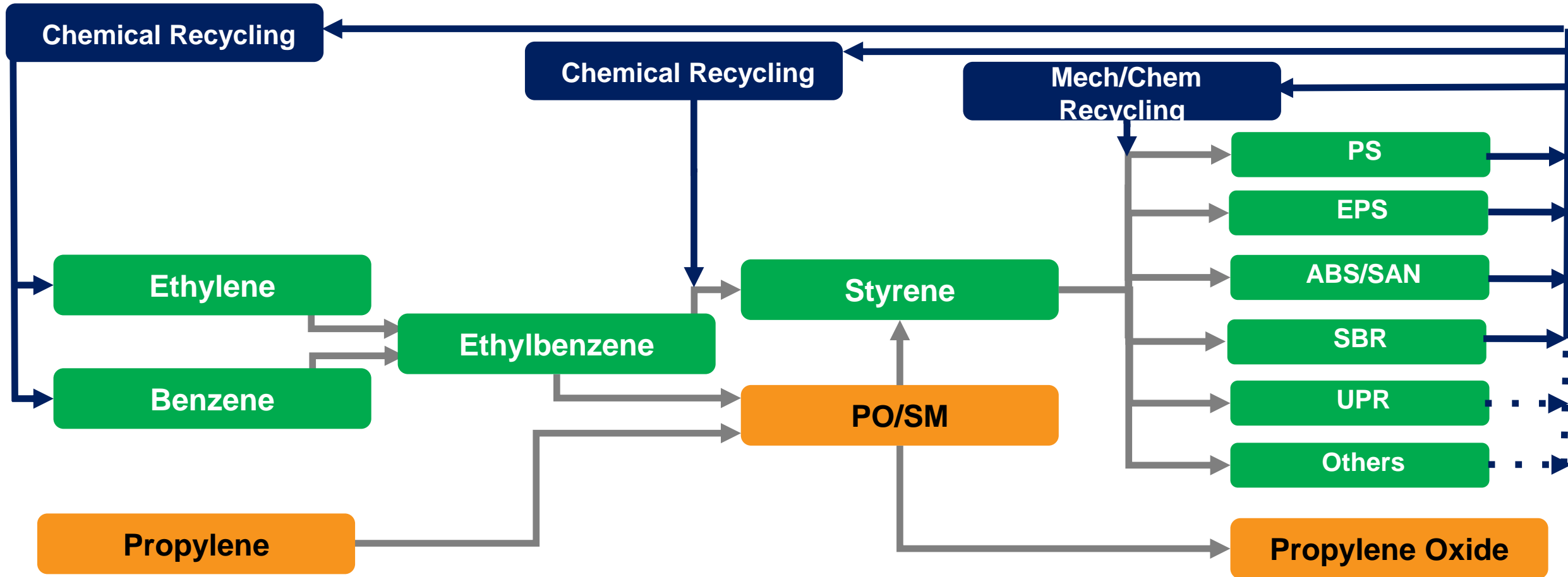
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What To Prepare For The Future

Preparing for sustainability

The Beginning of the Circular Economy for Styrenics



Sustainability Pressures Continue

China: Ban on the use of non-degradable tableware in dine-in catering service by end of 2025

The Japanese government has committed to reducing disposable plastics by 25% by 2030

India's New Plastic Waste Management Rules Effective from July 1, 2022



Neste, Idemitsu Kosan, CHIMEI and Mitsubishi Corporation have agreed to build a renewable plastics supply chain utilizing bio-based hydrocarbons for the production of styrene monomer

Idemitsu Kosan, KUMHO Petrochemical and Sumitomo Corporation sign MOU to Create a Bio Material Supply Chain

SK picglobal and INEOS Styrolution have signed MOU giving INEOS Styrolution access to renewable styrene monomer produced from SK picglobal's SM plant located in Ulsan, South Korea

First PS chemical recycling plant goes online with Agilyx technology. Denka and Toyo Styrene completed construction of the 3,000 ton/year



Benzene price will be steady and will pressure styrene economics.



Over-expansion has pushed global balances long, negative margins, and rationalization.



Flexibility, optimization and integration.



New sales strategy considering trade flow, barriers and logistics.



Preparation for sustainability

Q&A

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