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Petrochemical Industry Rebalancing Growth:

Market Resilience, Sustainability Transition & Value Creation

Alex Lidback, VP – Head of Chemical Analytics

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APIC 2026
Asia Petrochemical Industry Conference
FUKUOKA, JAPAN

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Macroeconomic Outlook & Global Megatrends

Alex Lidback, VP – Head of Chemical Analytics

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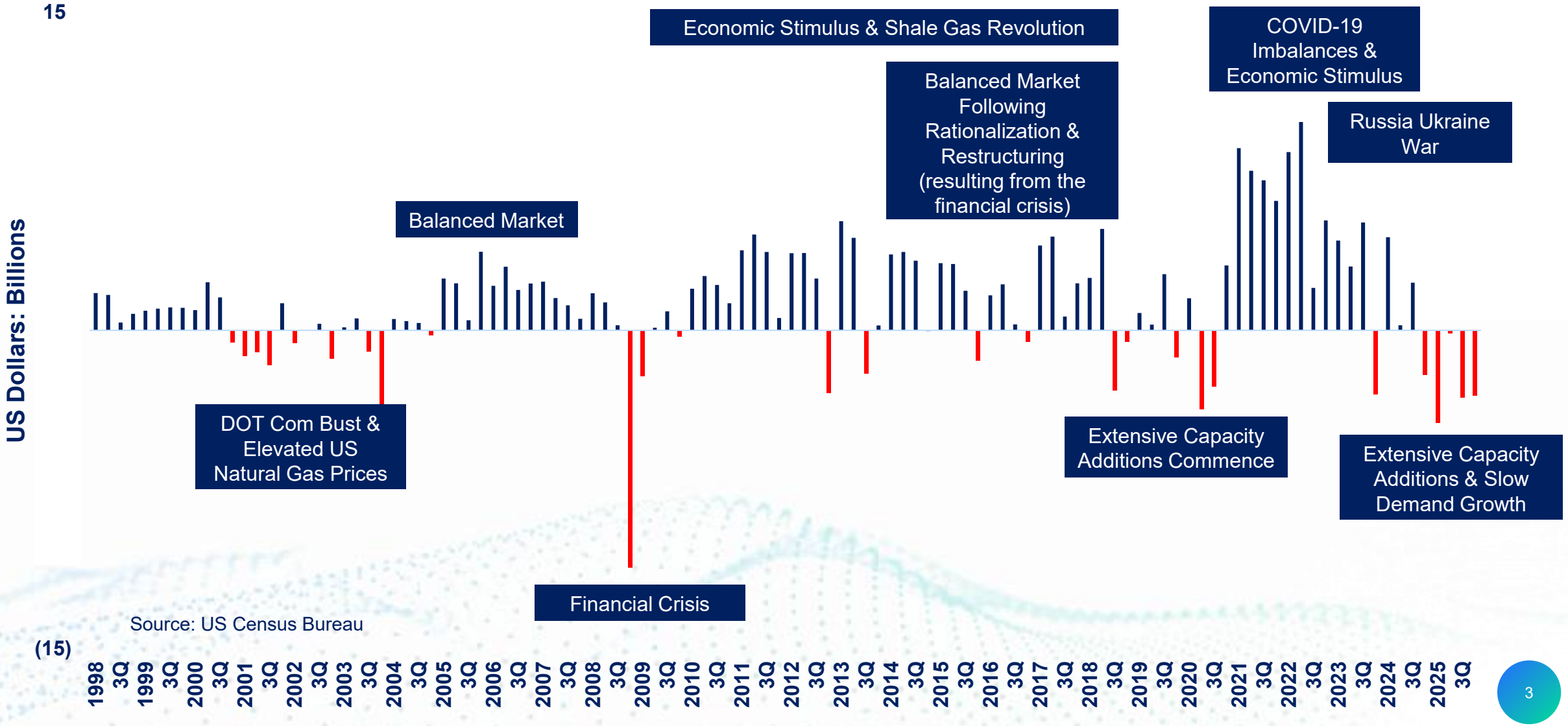
Financial Performance of the US Chemical Industry: 1998 – 2025 (quarterly)



Source: US Census Bureau

Source: Oxford Economics, adapted by ICIS

Duration over severity: scenarios for the global economy

Good Scenario

- Resolution (and opening of Strait of Hormuz) by end of Q2
- $100-125 per barrel; then moderates with peace agreement
- US and China slowdown with Europe and other Asia skirting recession
- Rising signs of a productivity-led investment boom led by AI and re-configuring supply chains

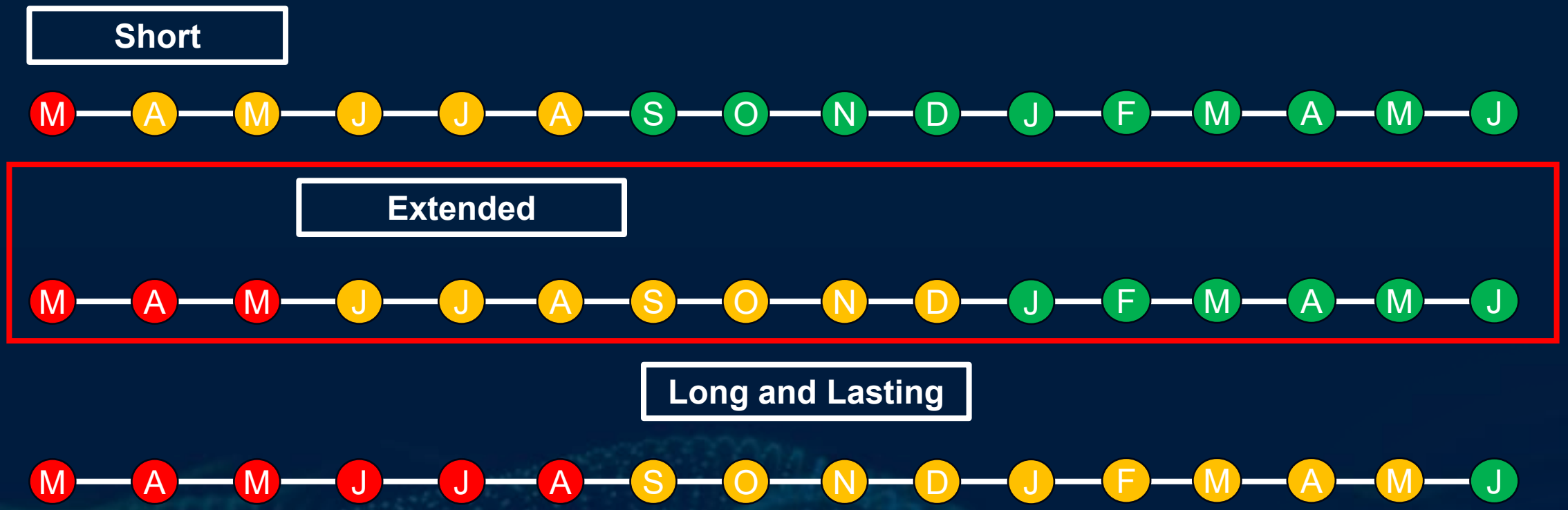
Bad Scenario

- Conflict lasts through end of summer which disruptions spreading
- $125-150 per barrel
- US slowdown with China skirting recession and Europe and other Asia in technical recessions

Ugly Scenario

- Extended conflict and disruptions become universal
- $175-225 per barrel
- A global recession that lasts well into 2027

The longer the disruption, the longer the recovery



Delayed recovery following Strait of Hormuz disruption

Crude Oil

- Sharp initial decline → Risk premium retained through 2026 → Gradual normalization starting 2027
- Actual tightness to last months: Field production restarts & vessel repositioning and insurance

Transportation Fuels

- Softer initial decline than crude; crack spreads remain elevated with refinery ramp-ups and lost capacity
- Gradual refinery ramp ups: ~5-6 months for undamaged sites. No assumed timeline for damaged sites

LPGs and Naphtha

- Softer initial decline than transportation fuels as limited storage keeps balances tight
- Refineries bias toward higher-value transportation fuels
- US LPGs supported by strong Indian demand amid global tightness

Ethane and Natural gas

- US Ethane & US natural gas largely insulated from global disruptions
- Continue to follow global dynamics

Key Points

- The length of the conflict will shape the future of the chemical industry
  - The longer it lasts, the more different the industry will look after it is over
  - Marginal assets will accelerate closures

- Projects will be **delayed** and/or **canceled**

- There will be **winners** and **losers** – long lasting changes are inevitable

- It is difficult to make a case for sustainable demand driven tightness – its **all about supply (for now)!**
  - Improved margins based on supply issues tends to be temporary
  - Global demand destruction is real

- North America is in an enviable position – expect continuous efforts to maximize margins

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Crude, Refining & Petrochemical Feedstocks: Impact from Recent Disruptions

Stefano Zehnder, VP ICIS Consulting

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FUKUOKA, JAPAN

Agenda

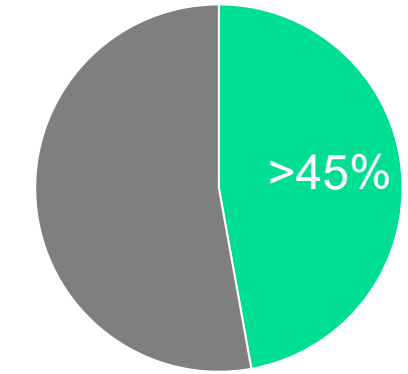
01 Hormuz Dependencies
02 Impact on Asia
03 Why Jet?
04 Potential Naphtha Losses

Global Dependency beyond Petrochemical Feedstocks

Global petrochemical feedstock flows are heavily exposed to Strait of Hormuz

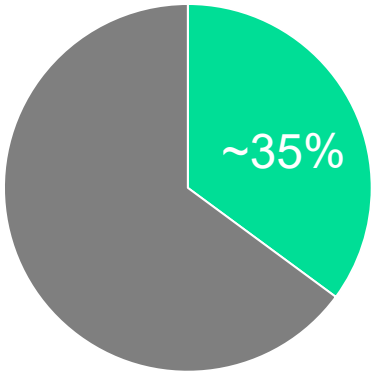
Global Inter-Regional Trade versus Hormuz Origin

2025
Global Naphtha Trade



Rest of World
Via Hormuz

2025
Global LPG Trade



Rest of World
Via Hormuz

- **Strait of Hormuz** restrictions affect global petrochemical feedstock availability
- **Naphtha** sourcing is primarily from Refineries, via Crude Oil
- **LPG** availability is almost entirely from NGLs, via Natural Gas

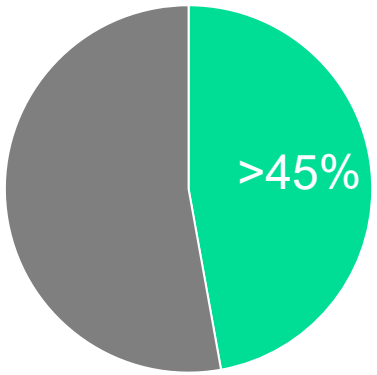
Source: ICIS Supply & Demand Database

Global Dependency beyond Petrochemical Feedstocks

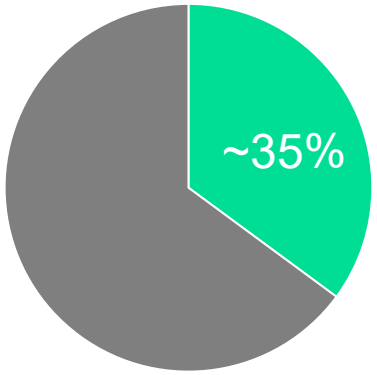
Strait of Hormuz dependence extends beyond petrochemical feedstocks to global crude oil supply

Global Inter-Regional Trade versus Hormuz Origin

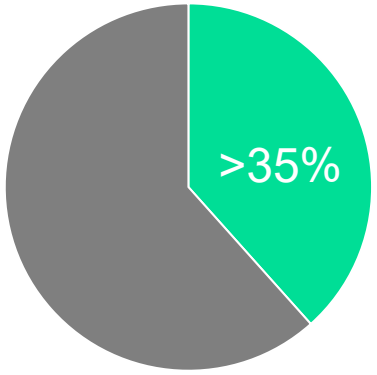
2025
Global Naphtha Trade



2025
Global LPG Trade



2025
Global Crude Oil Trade



- **Hormuz** restrictions also affect global **Crude Oil** (including Heavy Condensates) availability
- **Global Refining operations and key oil products are affected**

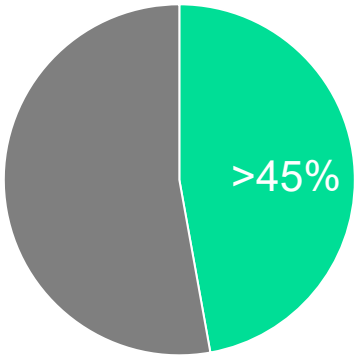
Source: ICIS Supply & Demand Database

Global Dependency beyond Petrochemical Feedstocks

Beyond crude oil and feedstocks, refined products remain exposed to Hormuz

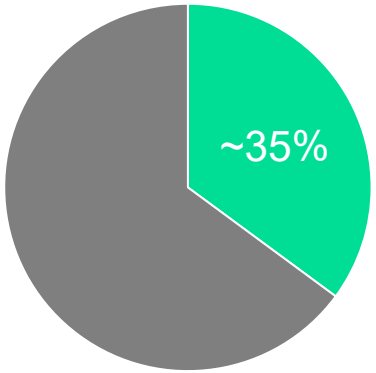
Global Inter-Regional Trade versus Hormuz Origin

2025 Global Naphtha Trade



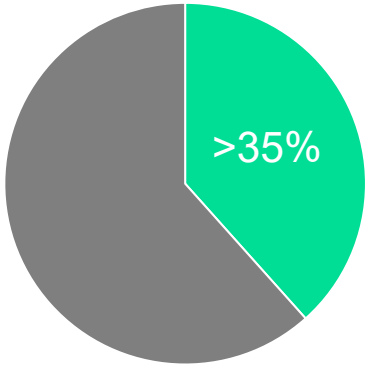
Rest of World
Via Hormuz

2025 Global LPG Trade



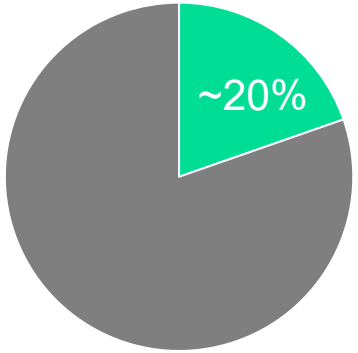
Rest of World
Via Hormuz

2025 Global Crude Oil Trade



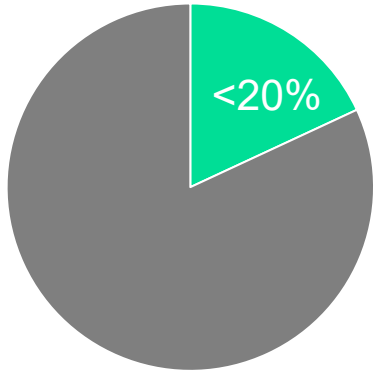
Rest of World
Via Hormuz

2025 Global Jet Trade



Rest of World
Via Hormuz

2025 Global Gas Oil Trade



Rest of World
Via Hormuz

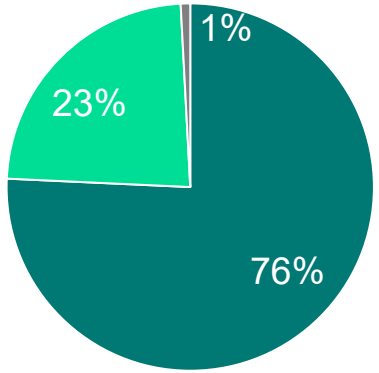
Source: ICIS Supply & Demand Database

Global Dependency beyond Petrochemical Feedstocks

Asia accounts for the majority of Hormuz-linked feedstock and crude flows, led by Northeast Asia

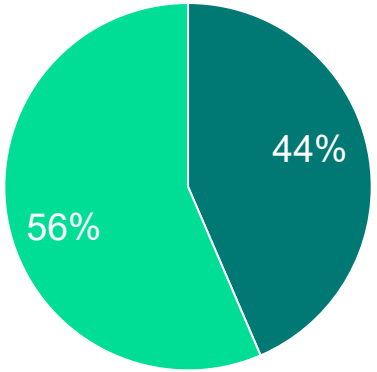
Asian Weight on Flows via Hormuz

2025
Hormuz Naphtha Flows



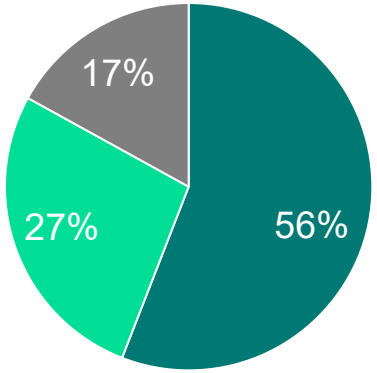
- To Northeast Asia
- To Asia & Pacific
- Rest of World

2025
Hormuz LPG Flows



- To Northeast Asia
- To Asia & Pacific
- Rest of World

2025
Hormuz Crude Oil Flows



- To Northeast Asia
- To Asia & Pacific
- Rest of World

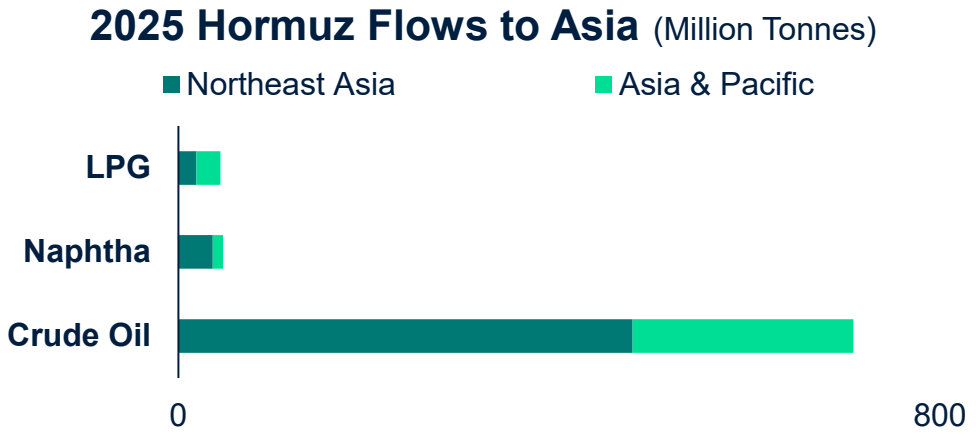
Asian Dependency on Flows via Hormuz

- **Naphtha = 60%**
- **LPG = 50%**
- **Crude Oil** (incl. Heavy Condensate) = **55%**

Source: ICIS Supply & Demand Database

Scale Matters

Feedstocks, Crude and Oil Products



Source: ICIS Supply & Demand Database

- **Asian Imports of Crude Oil overwhelm LPG and Naphtha**
- Whilst Northeast Asia is the main destination for naphtha imports, Asia and Pacific leads on LPG, mainly due to energy requirements in India

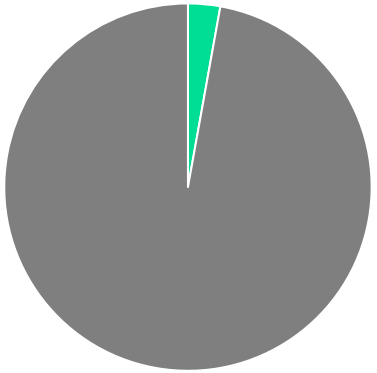
- **Asia is a net exporter of Middle Distillate**
- Imports of Crude Oil via Hormuz account for over one half of Regional Refinery Runs

Global Dependency beyond Petrochemical Feedstocks

While direct Hormuz exposure is limited, Asia's middle distillates remain dependent via crude supply

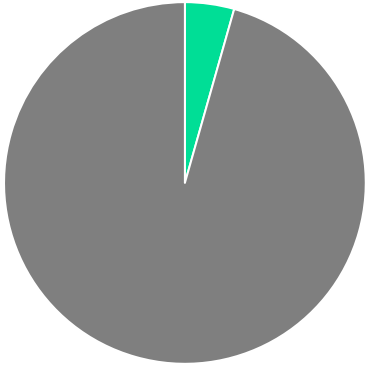
Asian Weight on Flows via Hormuz

2025
Hormuz Jet Flows



- To Northeast Asia
- To Asia & Pacific
- Rest of World

2025
Hormuz Gas Oil Flows



- To Northeast Asia
- To Asia & Pacific
- Rest of World

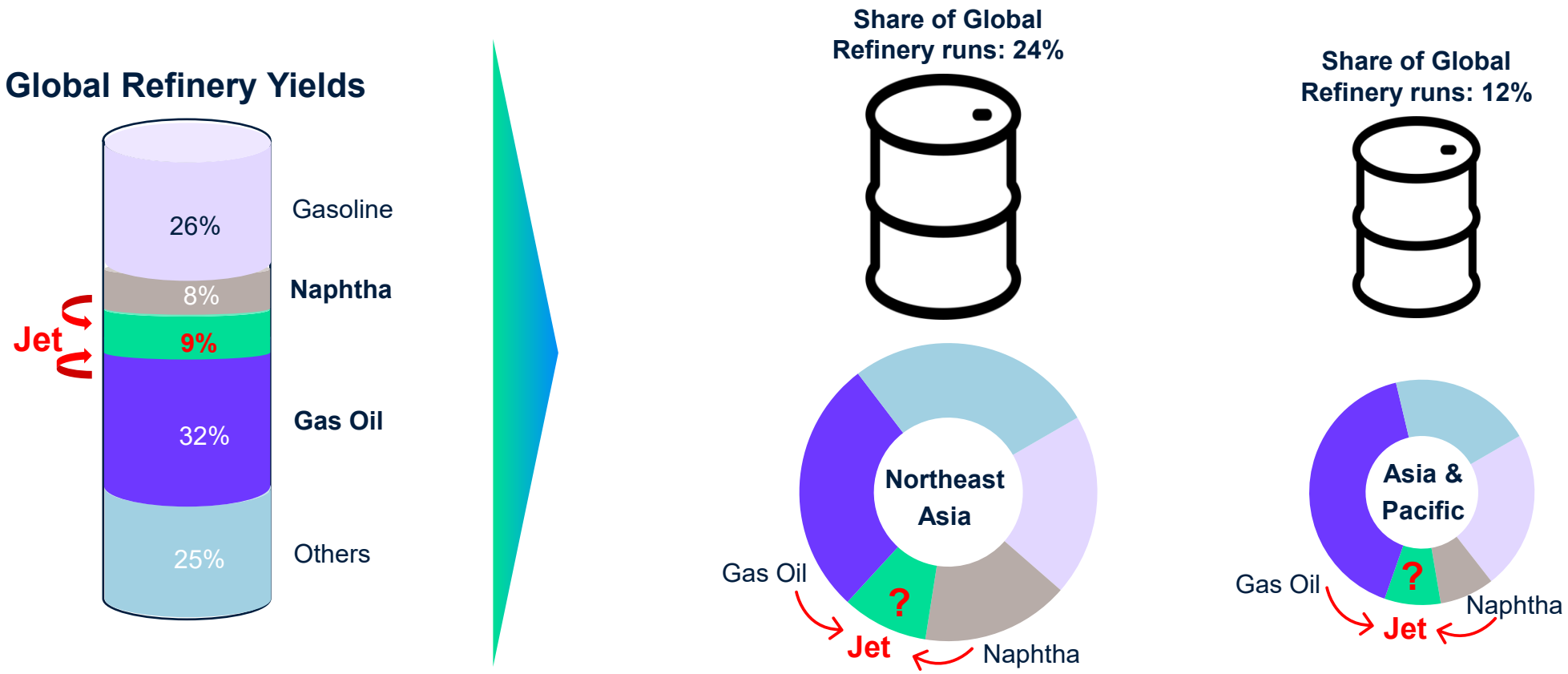
- **Asia is a net exporter of Middle Distillates**
- Imports of Crude Oil via Hormuz account for over one half of Regional Refinery Runs

Source: ICIS Supply & Demand Database

Global and Asia Refinery Yields

Refinery optimisation of jet fuel would come at the cost of naphtha (and gas oil) yields

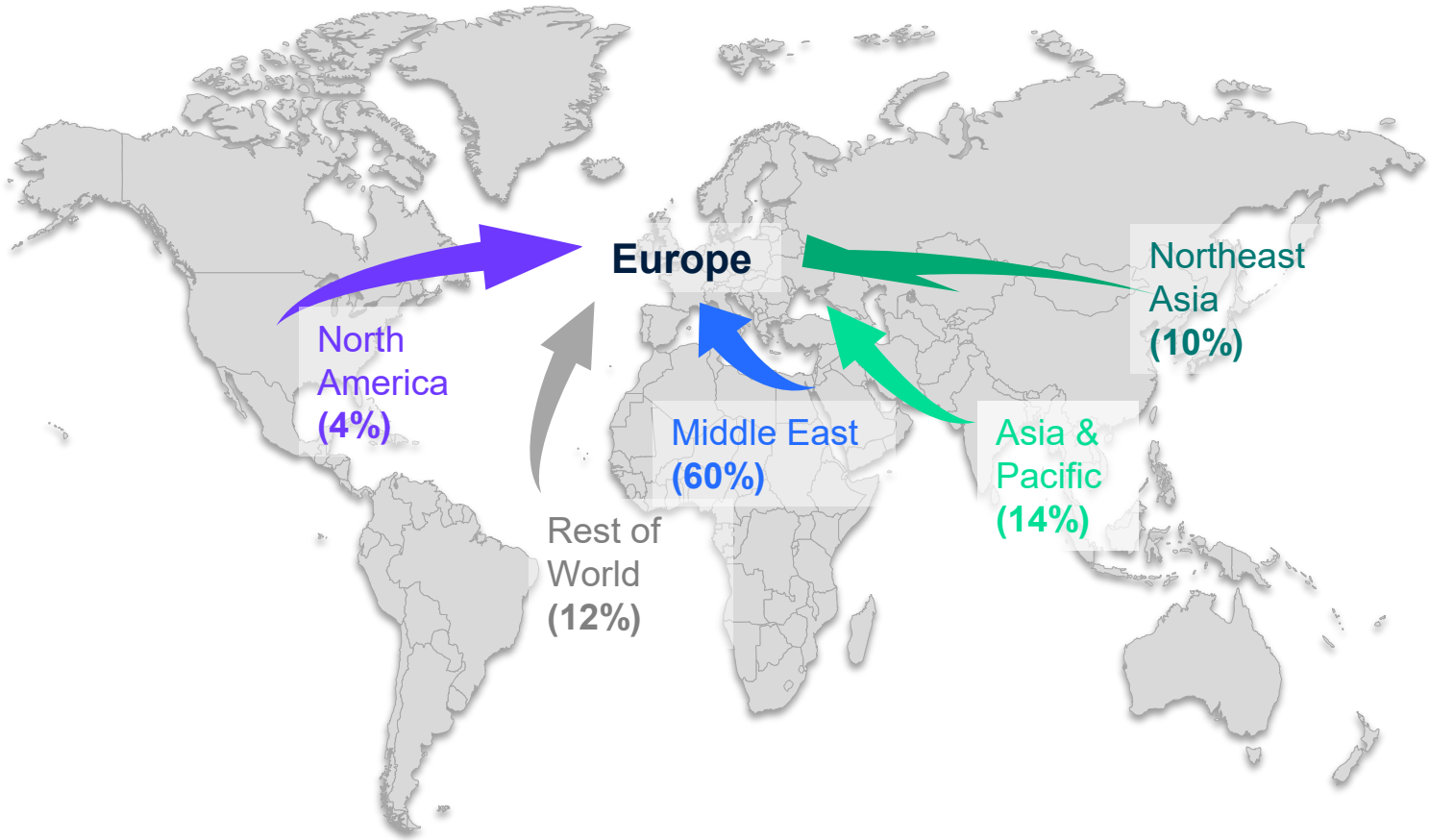
Global & Asian Refinery Yield (2025), Weight %



Why focus on Jet?

Impact on Europe will be a major driver for Asian refineries

Europe Jet Fuel Regional Imports, 2025 (%)

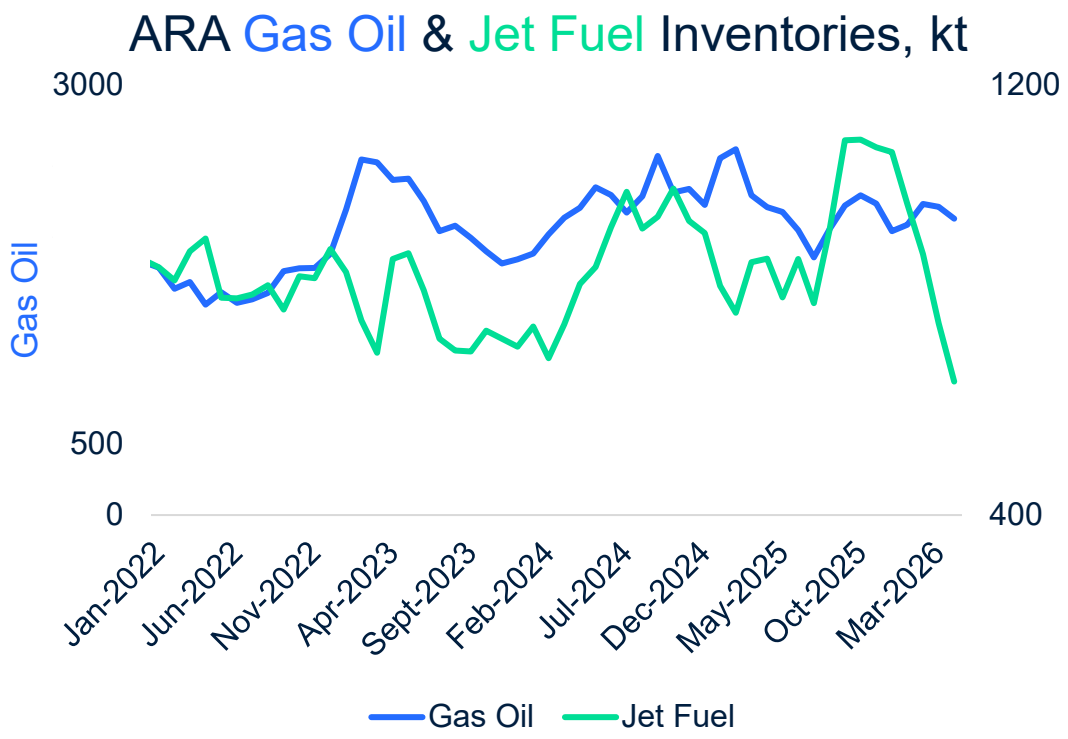


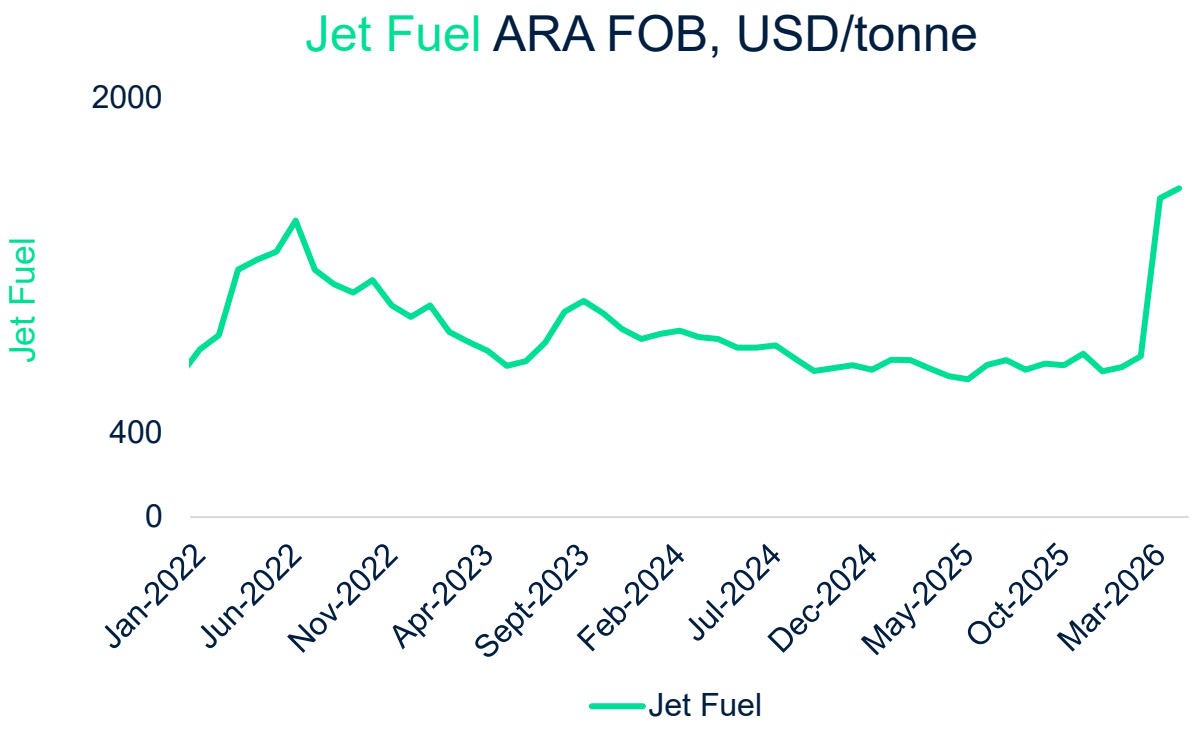
- Europe is the **largest Importer of Jet Fuel globally (38% of global flows)**
- **84% of European Imports** are influenced by Strait of Hormuz blockage
- Total Imports accounted for 40% of Europe's regional jet demand
- **As the refining industry maximizes Jet yields (price…), this will be at the expense of Naphtha and Gas Oil output**
- Europe's Gas Oil situation is also affected by Hormuz, albeit to a lesser extent (dependency is 68%)

Source: ICIS Supply & Demand Database

Why focus on Jet?

Reduced import availability has resulted in declining inventories and elevated prices in Europe

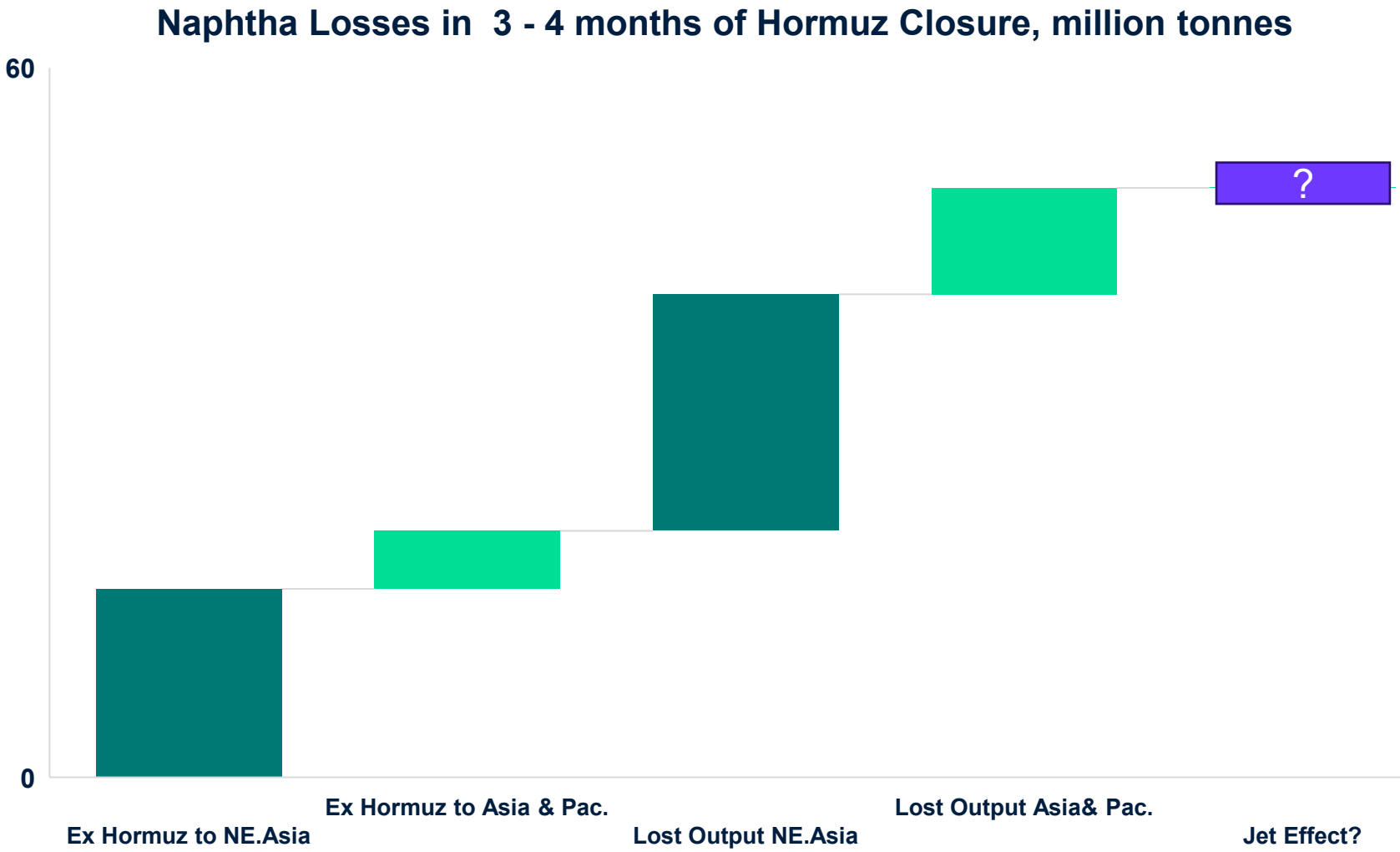




Source: ICIS Pricing

Potential Naphtha Losses from Hormuz Issues

Impact on Asia, one of the Scenarios



- **Restart of export flows will take some time**
- While some of the Asian crude imports are substituted, **regional production losses are unavoidable**
- **Jet maximization would further dent on naphtha output**

Source: ICIS Consulting

Conclusions

1. **Restricted Hormuz flows affect Asian petrochemical Industry beyond Feedstock imports**

   Asia is most affected by Hormuz restrictions. In addition to naphtha and LPG import losses, lower crude runs affect key availability from regional refineries

2. **Evolving tensions on Jet availability could further impact on Feedstocks balances**

   Tightening Jet availability and price spikes could influence refiners' ability to release feedstocks. A global issue, with Europe at center stage

3. **Duration and Impacts remain uncertain: a Scenarios Approach is required**

   Export alternatives to Hormuz routes and imports diversifications are maximized, and so is refiners' flexibility. Notwithstanding, imbalances are growing and demand decline is part of the answer. A Scenarios Approach is required: to allow flexibility in the timing and extent of Strategic initiatives

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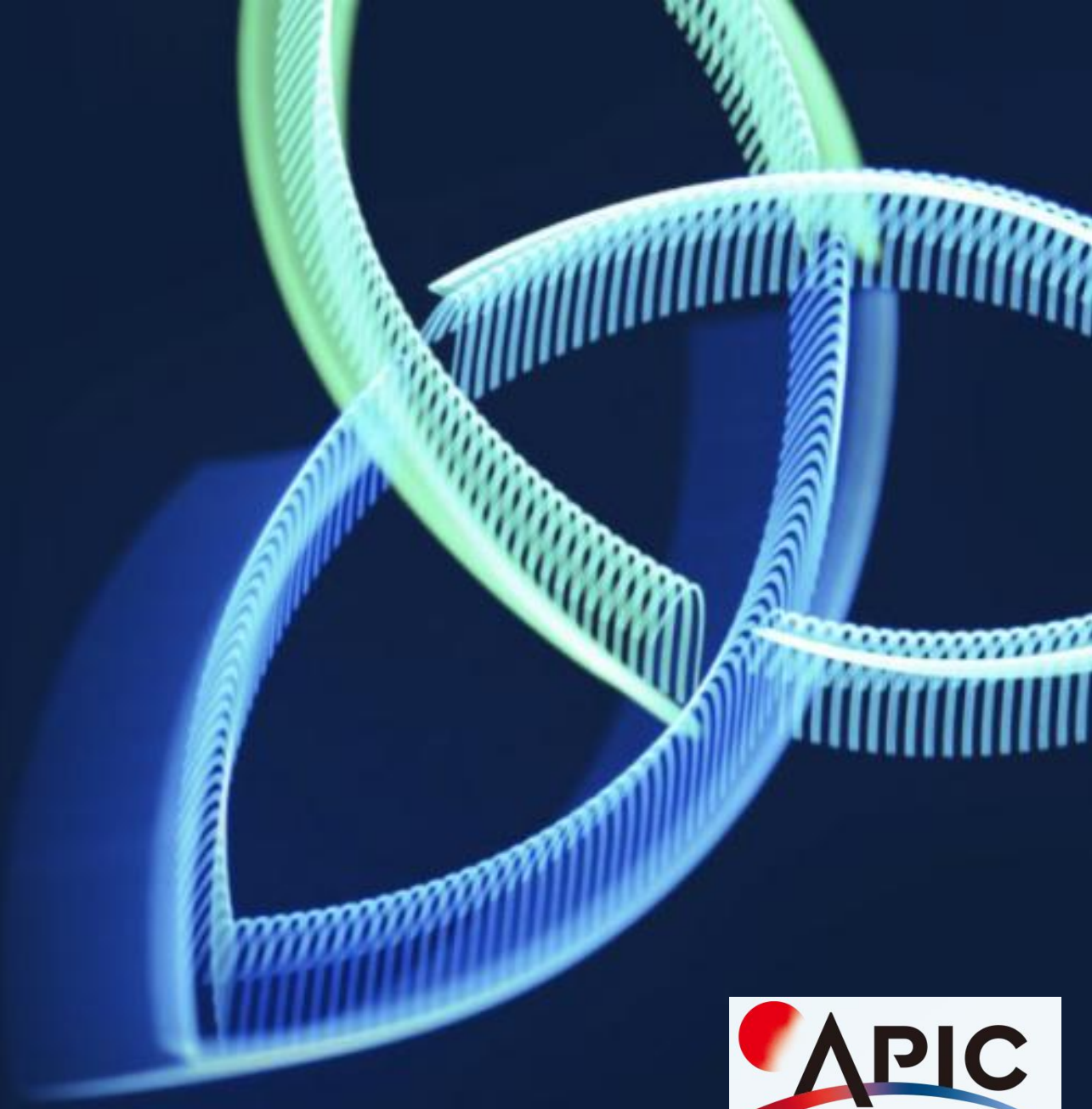
From Overcapacity to Disruption: Industry Rationalisation, Emerging Risks and Sustainability Transition



Bala Ramani, VP of APAC Consulting

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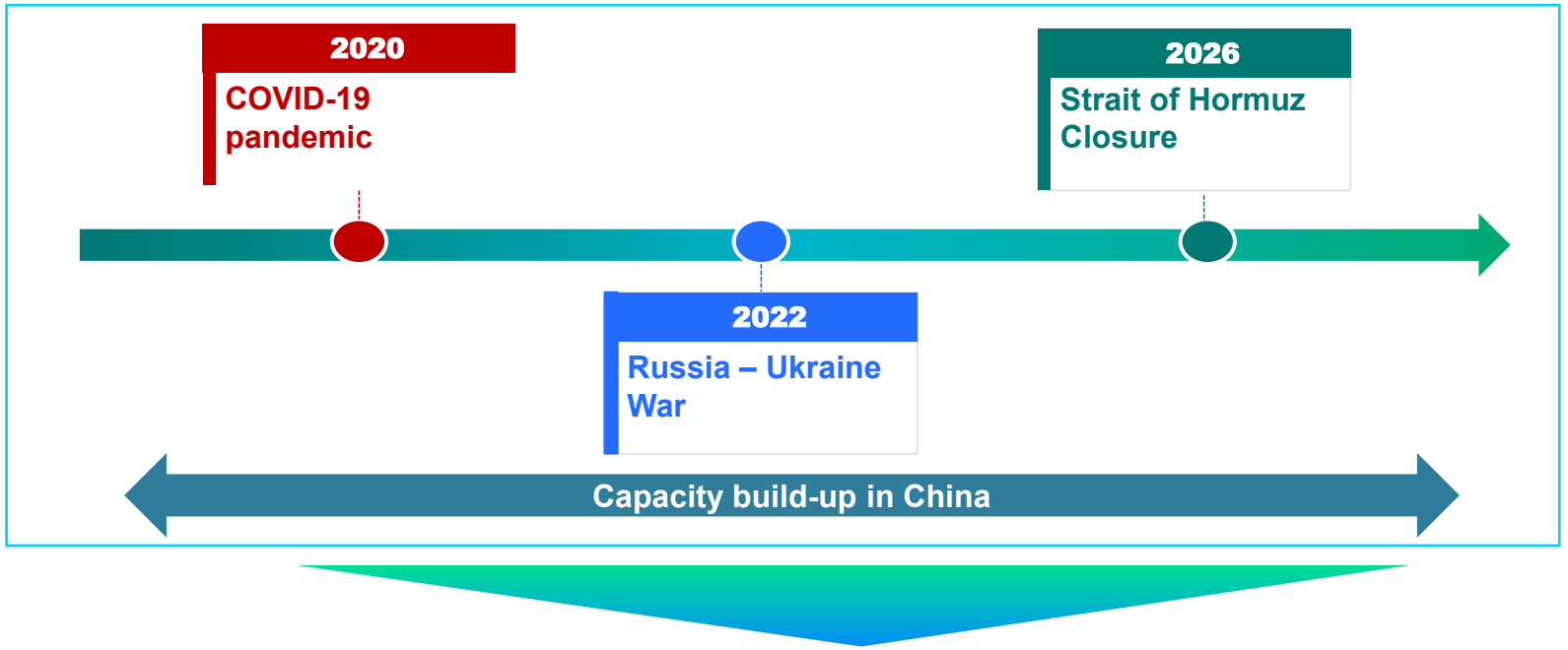
Agenda

01 Petrochemicals Industry : State of Play
02 Overcapacity and Industry Rationalization
03 The Conflict and its Impact
04 Outlook: Recovery and Strategic Implications
05 Petrochemical Industry Crossroads

The petrochemical industry has been in survival mode since 2020, each shock arriving on a foundation weakened by the last

Petrochemicals Under Pressure: Series of Compounding Crises

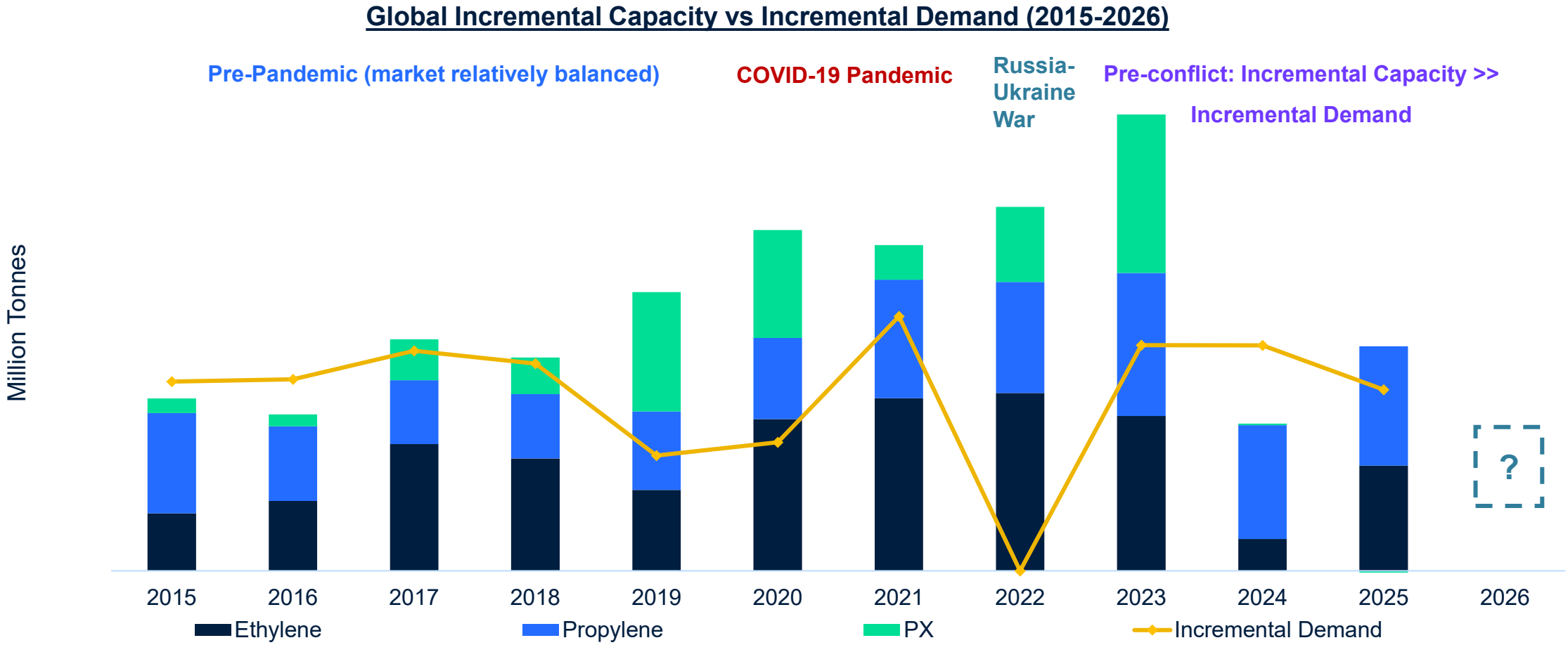


THE COMPOUNDING CHAIN OF PRESSURES

Overcapacity → Depressed Demand → Low Utilization Rates → Negative Margins → Capacity Rationalization

Capacity additions have outpaced demand growth post COVID-19 pandemic, leading to a persistently oversupplied market

Global Building Block Chemicals Incremental Capacity and Demand

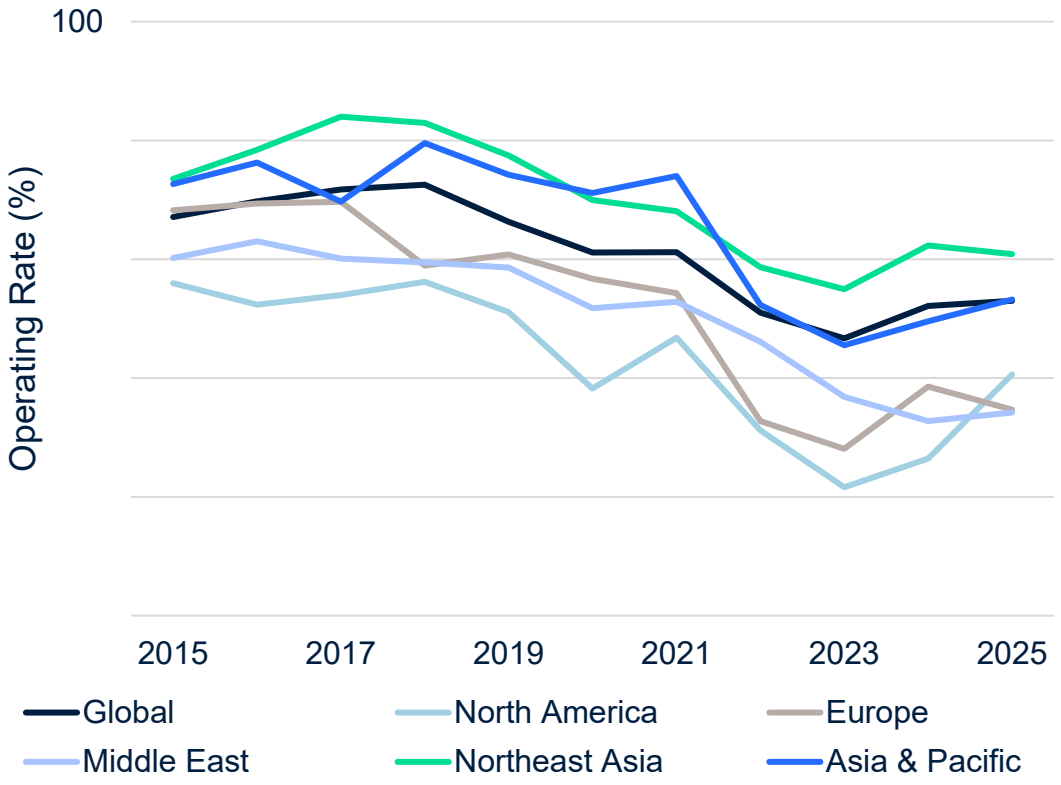


Source: ICIS Supply & Demand Database

Despite falling global utilisation rate, the petrochemical prices (IPEX) remain resilient, reflecting stronger linkage to feedstock costs and disruption risk

Depressed Capacity Utilisation

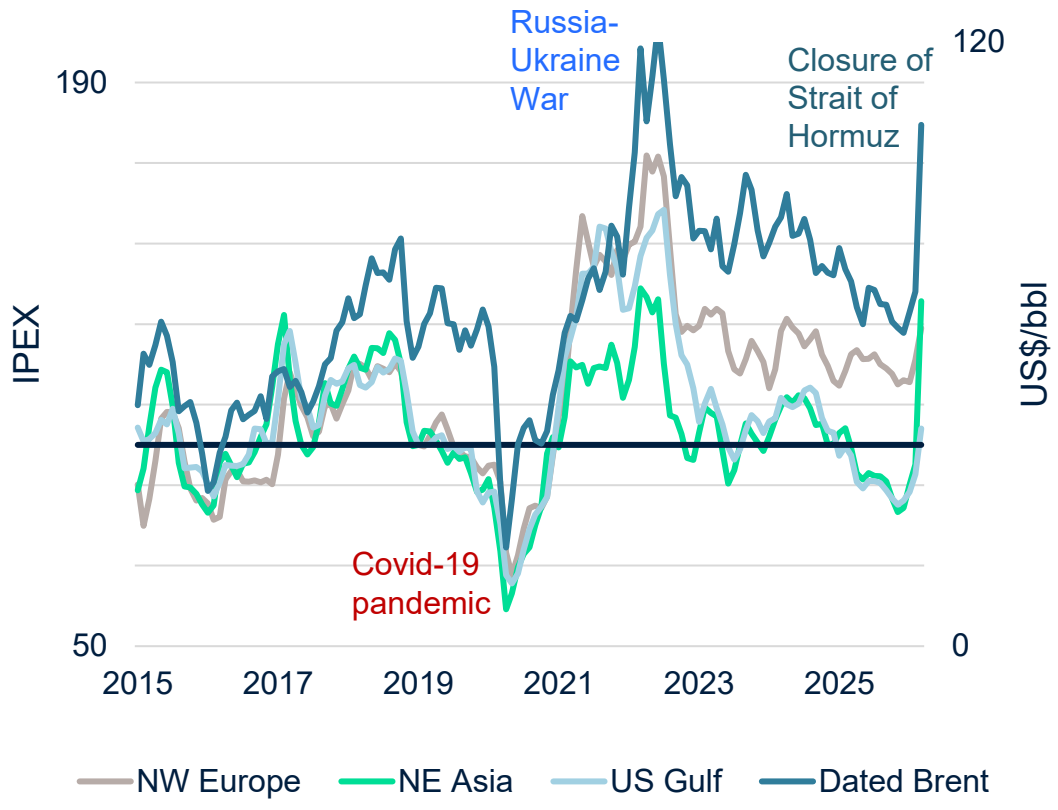
Global Basic Chemicals* Utilisation Rate by Region



**Basic Chemicals include Ethylene, Propylene & Paraxylene*

Source: ICIS Supply & Demand Database

ICIS Petrochemical Index, IPEX (2019 = 100)

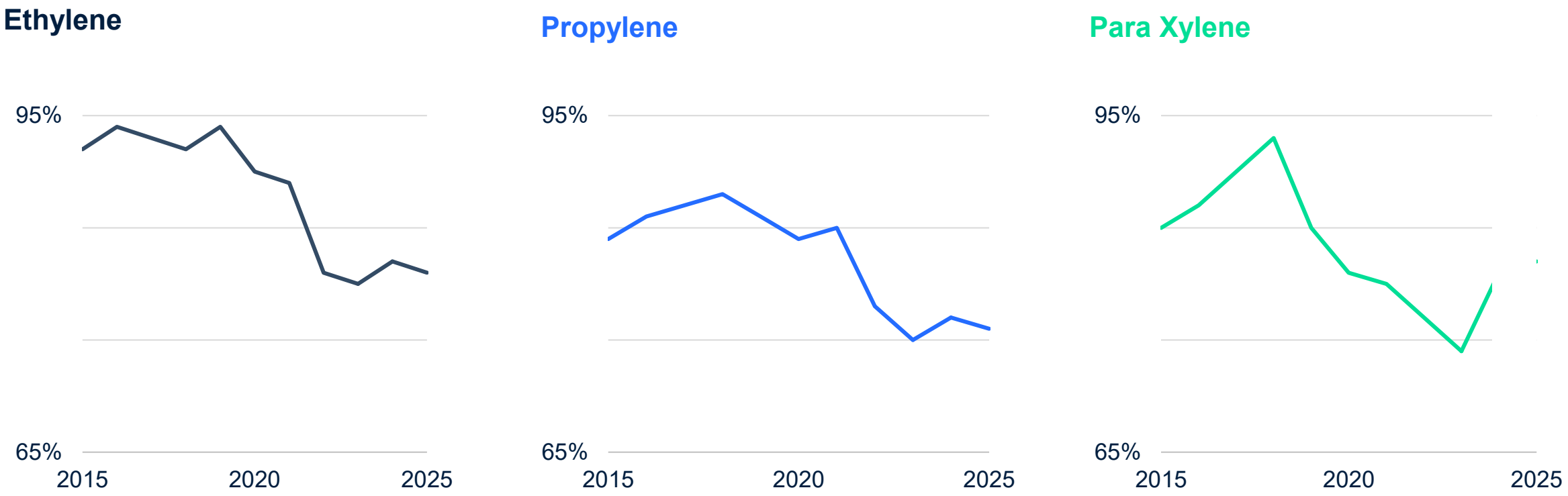


Source: ICIS Pricing

Asia's petrochemical industry faces a structural oversupply crisis, with operating rates at unprecedented lows across all three key building blocks

Asian Operating Rates - Unprecedented Lows

Asian Operating Rates (2015-2025),%

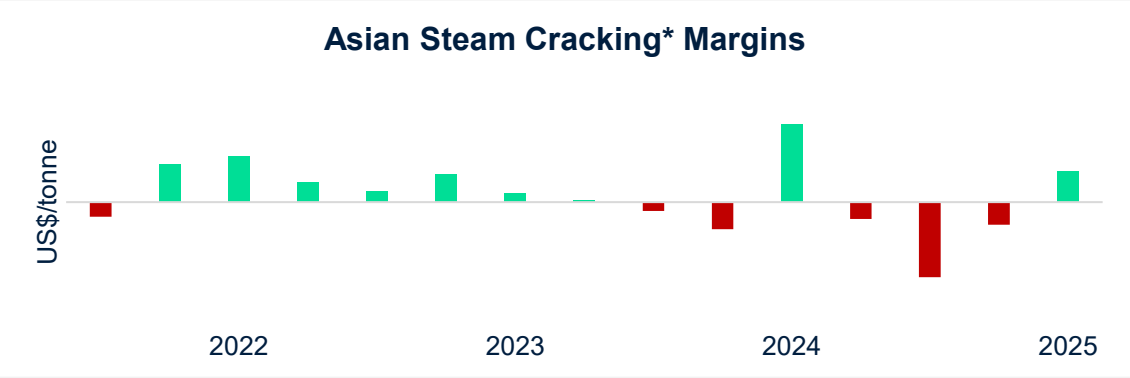


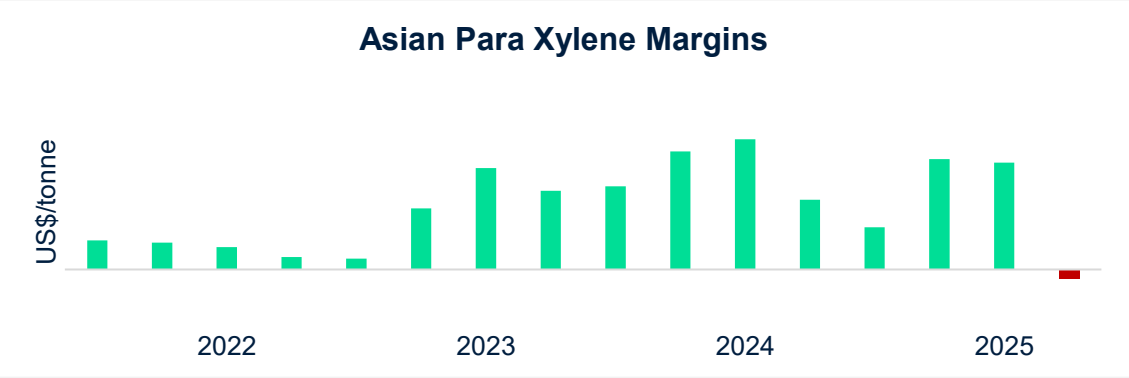
Source: ICIS Supply & Demand Database

Asia's margin pressure is not uniform, underscoring divergent dynamics across value chains

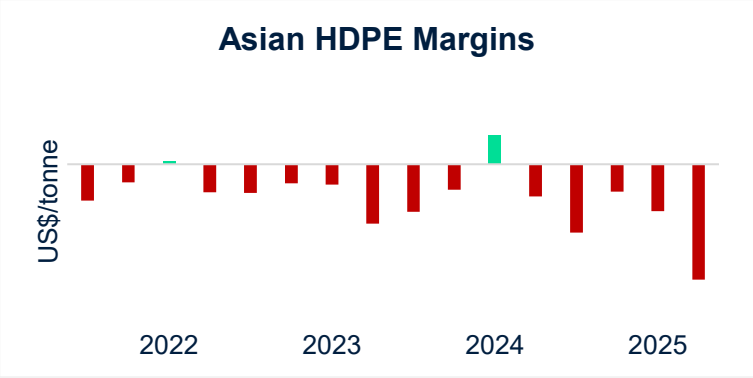
Margin Pressures Across Asia's Petrochemical Value Chains

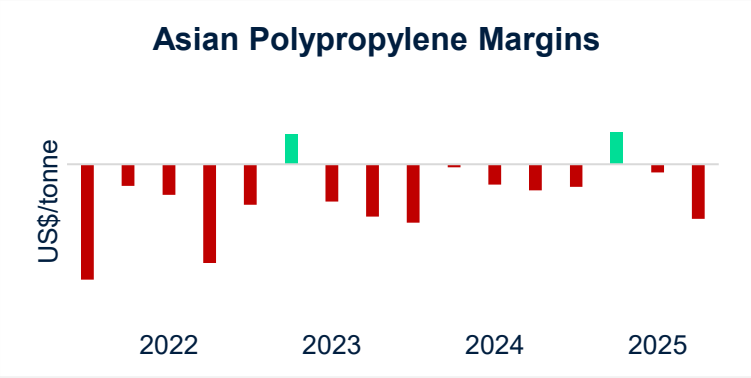
Asian Petrochemicals Margins (US$/tonne), 2022-2025

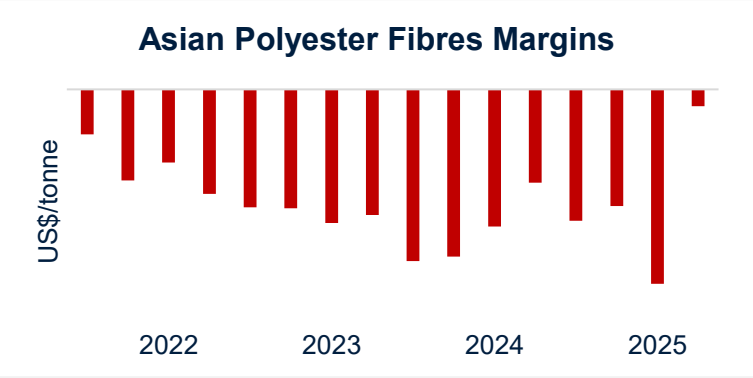




expressed as Light olefins (Ethylene/Propylene)





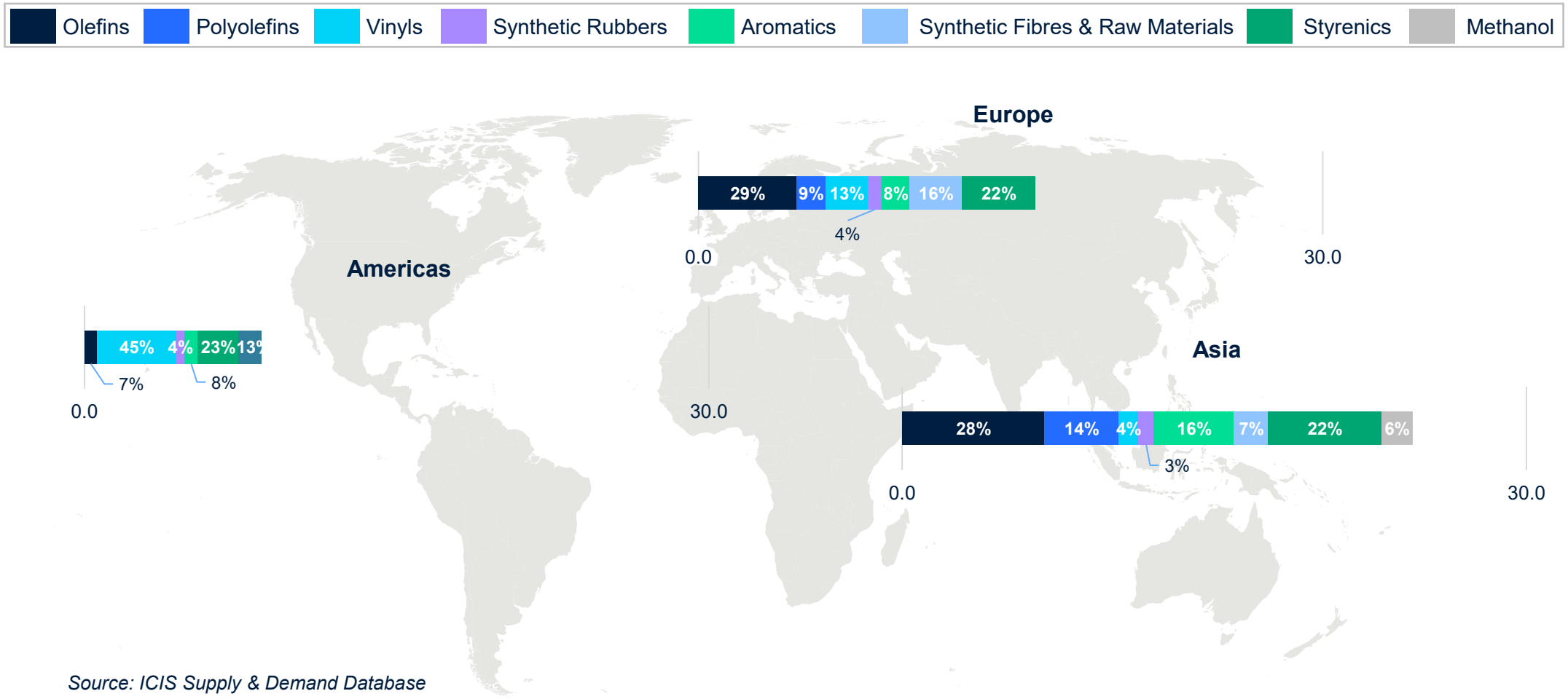


Source: ICIS Pricing

Sustained margin pressure across petrochemical value chains has accelerated capacity rationalisation, concentrated predominantly in Northeast Asia & Europe

Global Petrochemicals Rationalisation

Global Capacity Rationalizations (2021-2025), million tonnes

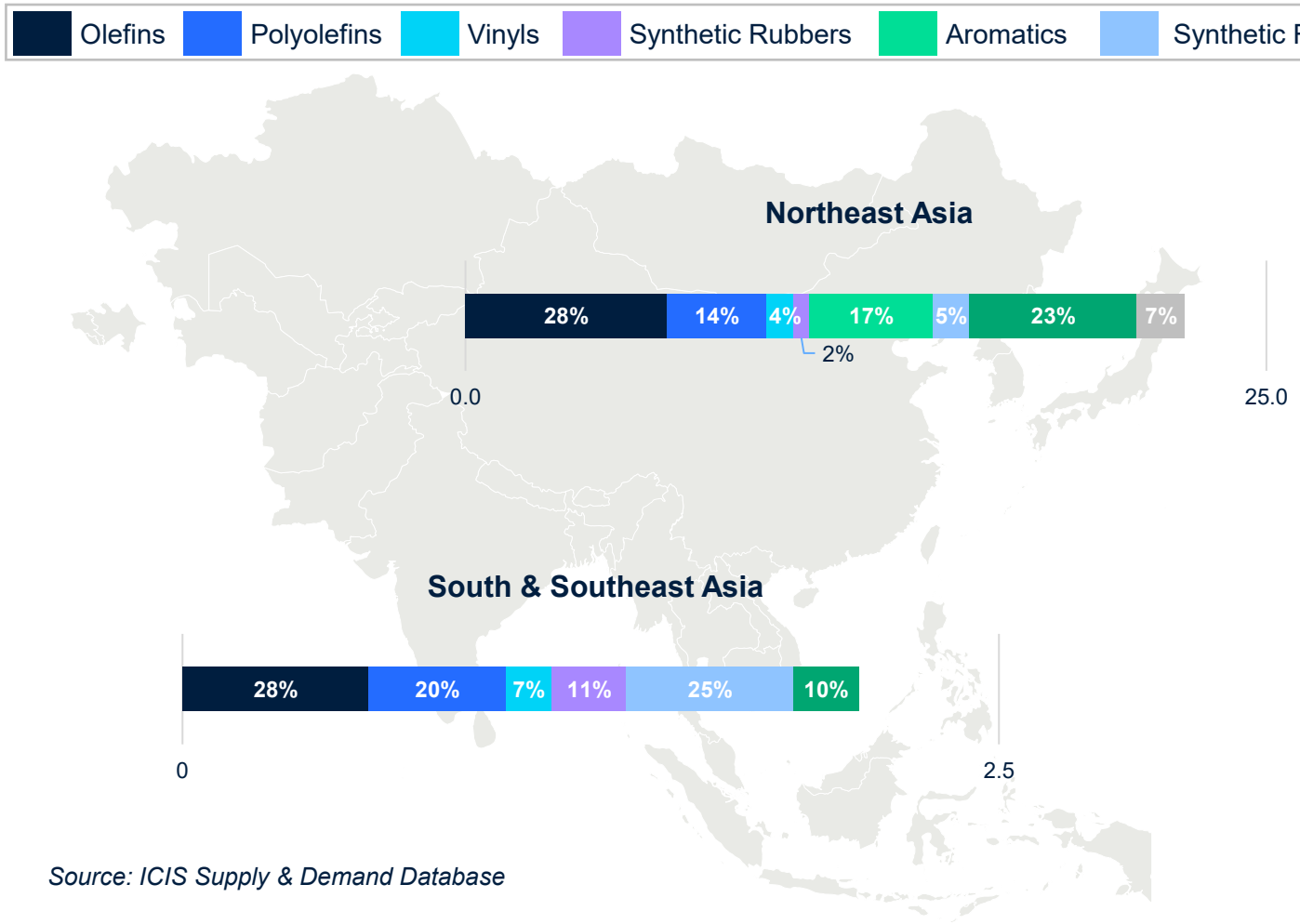


Source: ICIS Supply & Demand Database

Between 2021 and 2025, Asia rationalized ~24 million tonnes of capacity, with most of it concentrated in Northeast Asia

First Wave of Asian Exits: 2021-2025

Asian Capacity Rationalisations (2021-2025), million tonnes



Source: ICIS Supply & Demand Database

Japan and China led the permanent closure wave in NEA. In China, smaller and less efficient integrated complexes exited as the country's own capacity build-out rendered them redundant.

Closures in Southeast Asia were driven by high naphtha feedstock costs and limited scale, leaving facilities unable to compete against lower-cost competitors in the regional markets they were built to serve.

Beyond the permanent closures, SEA saw a separate wave of **prolonged shutdowns**.

Petrochemical value chains faced significant strain from the disruption, forcing governments to coordinate urgent responses to protect downstream industries

Strait of Hormuz Disruption

		China	Japan & South Korea	India	Southeast Asia
SOURCING	Crude and naphtha pivot to alternate sources	■	■	■	■
	Emergency spot procurement from non-Gulf sources	□	■	□	■
STRATEGIC RESERVES	National strategic petroleum reserve released	□	■	□	□
CONSUMPTION	Export restrictions on petroleum products	■	□	■	■
	Price controls / subsidies / tax cuts	□	□	■	■
	Government consumption reduction directives	□	□	□	■
GOVT./INDUSTRY RESPONSE	LPG / cooking fuel rationing and priority allocation	□	□	■	□
	Biofuel and coal substitution accelerated	■	□	□	■
	Petrochemical run rate cuts / force majeures	■	■	□	■

Strategic Reserve Releases
Governments tapped emergency stockpiles at record scale

Feedstock & Supply Measures
Direct government intervention in upstream supply allocation

Export Restrictions
Net exporters moved quickly to prioritise domestic supply

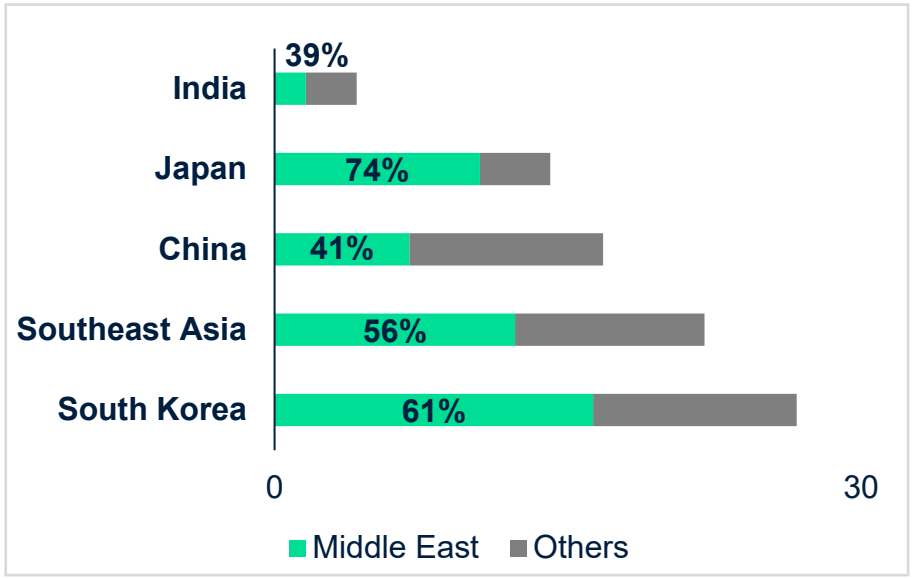
Energy Mix Switching
Coal and other types of energy are preferred

Source: ICIS Clarity Platform

Asian Petrochemical sector has a high reliance on Middle East for cracker feedstocks, with no alternative supply of comparable scale

Asian Cracker Feedstock Dynamics

Naphtha Import Dependency (2025), %

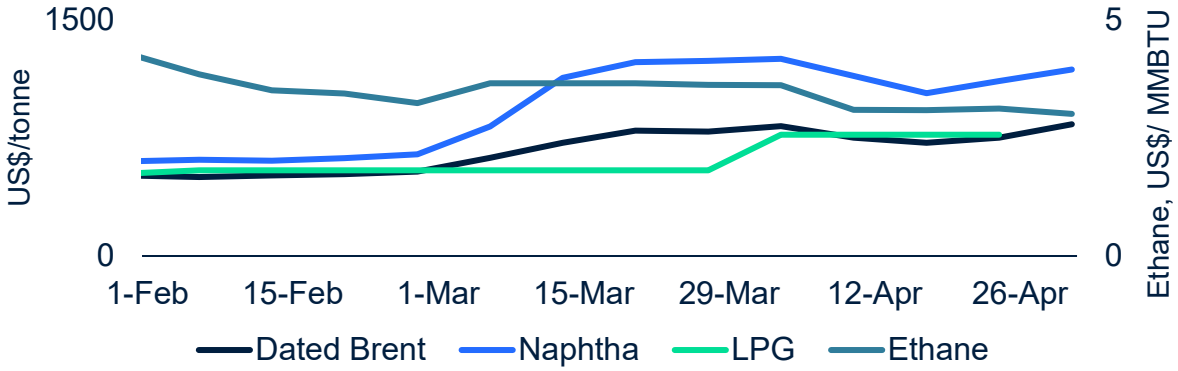


75%
of global naphtha
to steam cracking & reforming
is consumed in Asia

50%
of global LPG
to PDH and crackers
is consumed in Asia

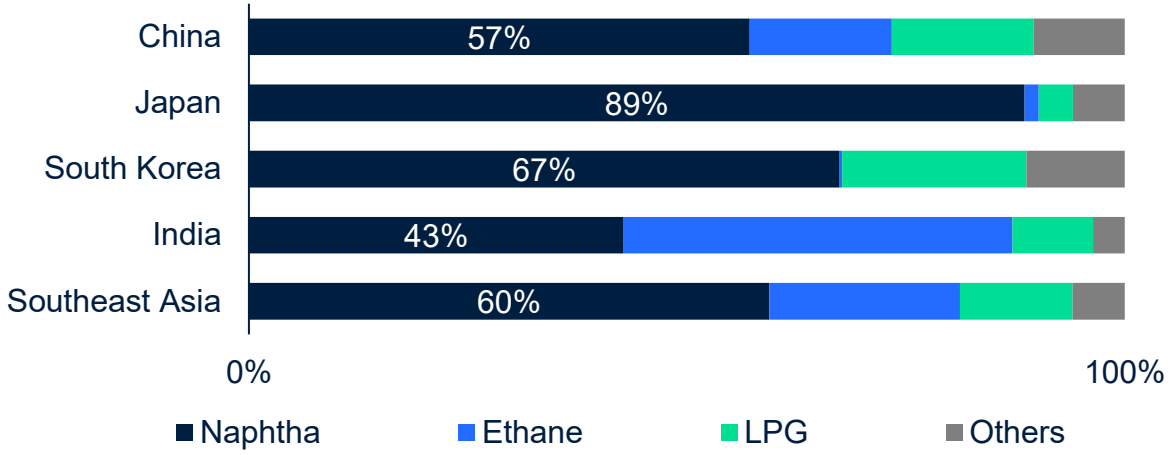
Source: ICIS Supply & Demand Database

Cracker Feedstock Prices, US$/bbl



Source: ICIS Pricing

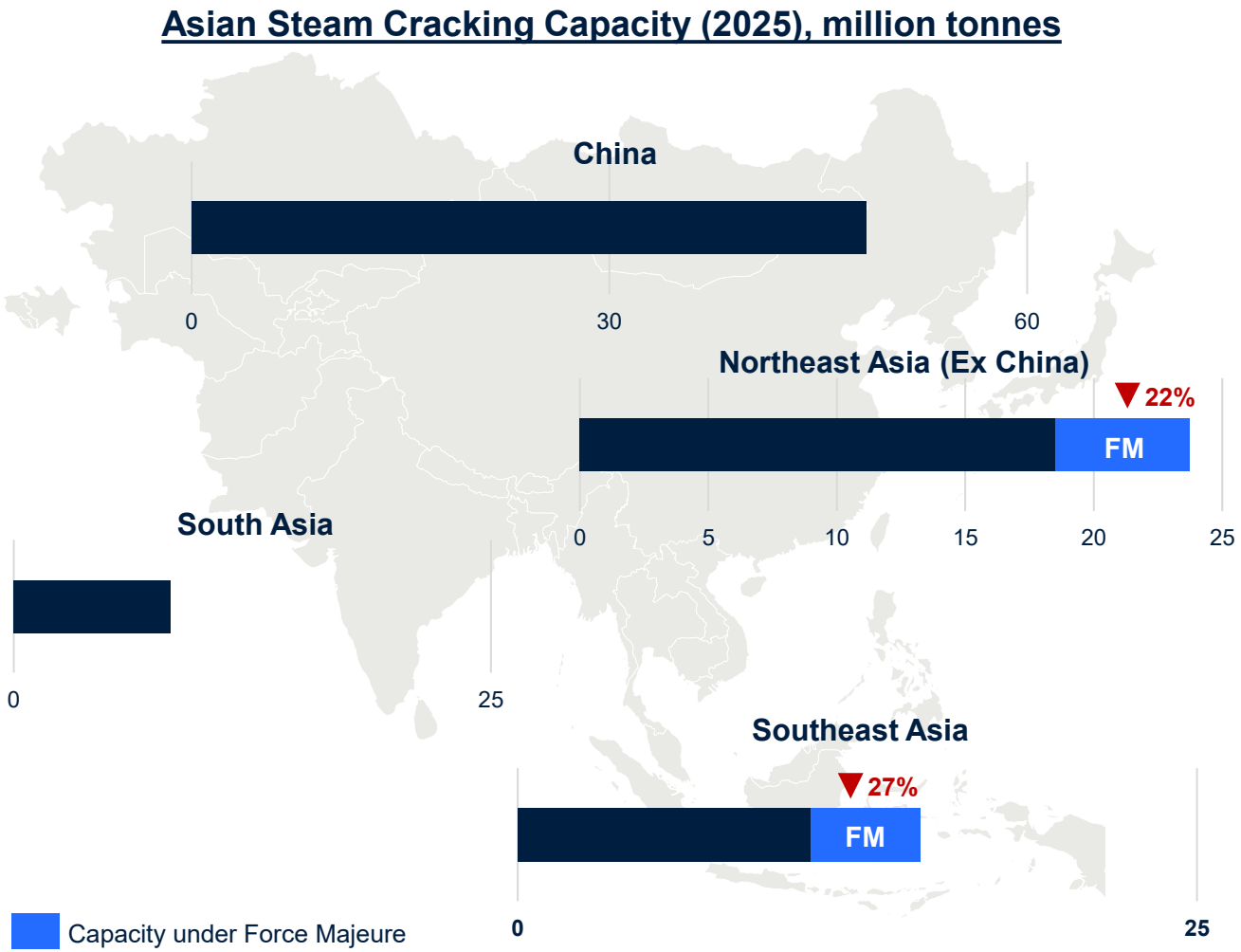
Asian Cracker Feedstock Slate, %



Source: ICIS Supply & Demand Database

Standalone crackers dependent on imported naphtha were the first to declare force majeure

Impact of the Hormuz Disruption on Crackers



Source: ICIS Supply & Demand Database

Upstream Integration:

- Refinery integration provided a degree of supply continuity that standalone crackers did not have.
- Standalone crackers with no domestic alternative had no options when seaborne supply was disrupted.

Feedstock Flexibility:

- Feedstock type was the primary determinant of operational outcome.
- Gas and pipeline-fed crackers had no direct exposure to the seaborne supply disruption.
- Flexibility across naphtha, LPG and ethane gave operators more options to manage feedstock availability.

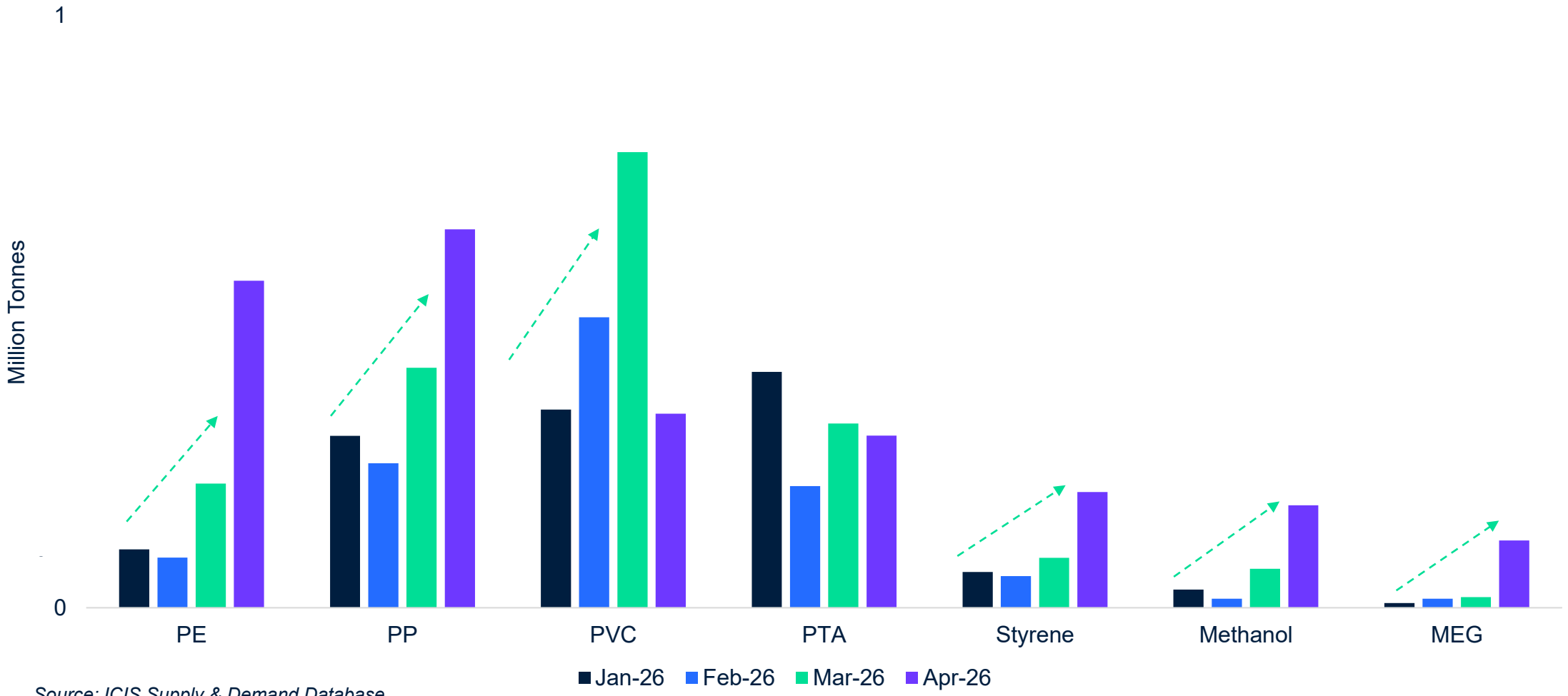
China's Relative Resilience

- Diversified logistics provided a physical "Hormuz bypass" for domestic production.
- Land-based feedstocks (CTO/Pipeline) decoupled cracker operations from maritime trade risks.
- Integrated mega-complexes utilized yield flexibility and state reserves to prevent Force Majeures.

While regional peers curtailed production, China’s exports surged to fill the resulting supply deficits in some value chains, demonstrating an asymmetric impact

China's chemical export respond to regional supply reduction

China’s Export volumes for selected chemicals (2026), million tonnes

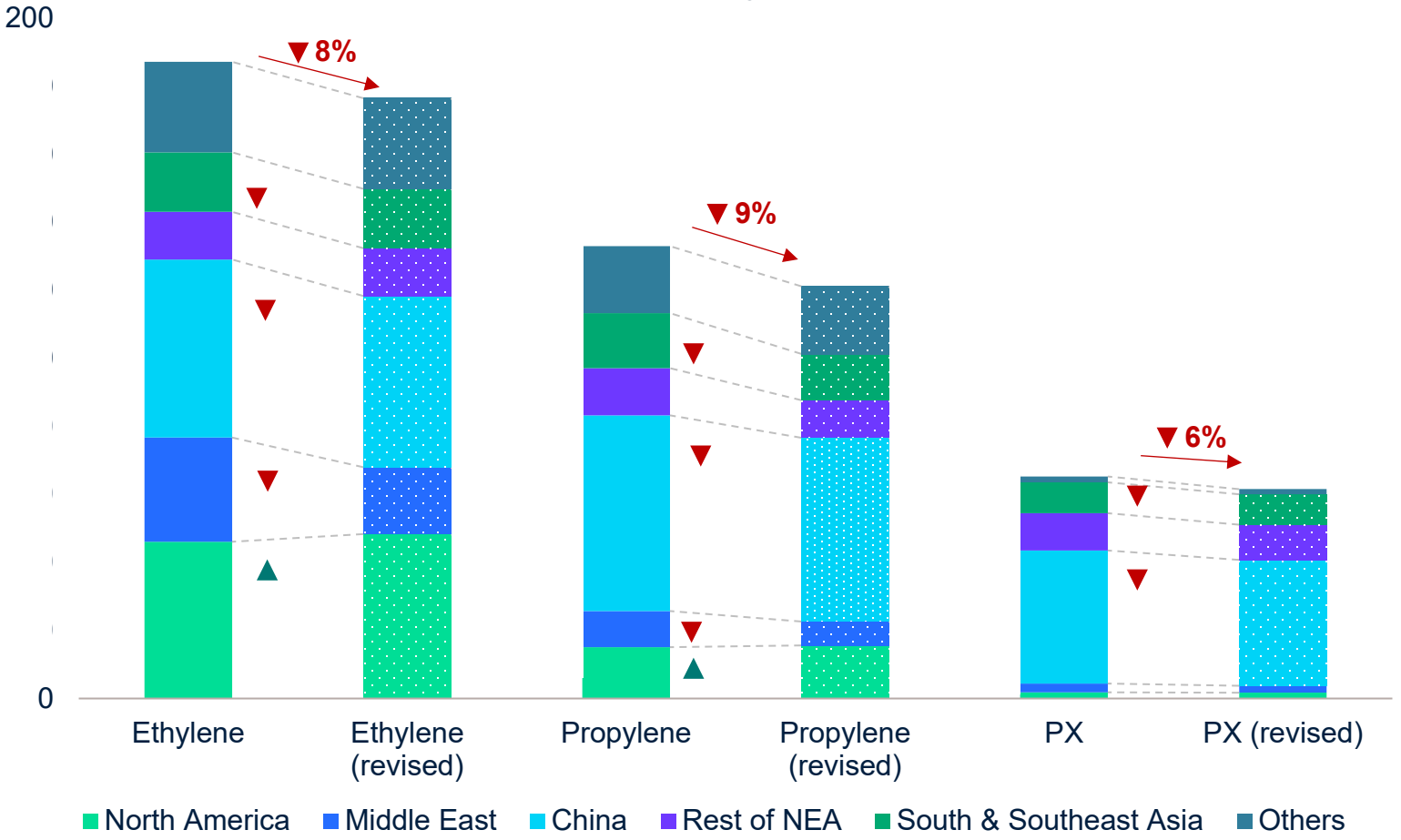


Source: ICIS Supply & Demand Database

The disruption could lead to a potential contraction of overall 6-9% in 2026 petrochemical production

Hormuz Disruption on Building Block Chemicals Supply Forecast (2026)

Global Supply forecast revisions to 2026, million tonnes



Localised Feedstock Advantage

U.S. producers leveraged domestic ethane to expand output, gaining significant market share as global naphtha-based competitors faced severe supply shocks.

Inventory Capacity Thresholds

Middle Eastern production was curtailed as maritime restrictions halted outbound flows, forcing operational slowdowns once regional storage for liquid derivatives reached capacity.

Resource Allocation

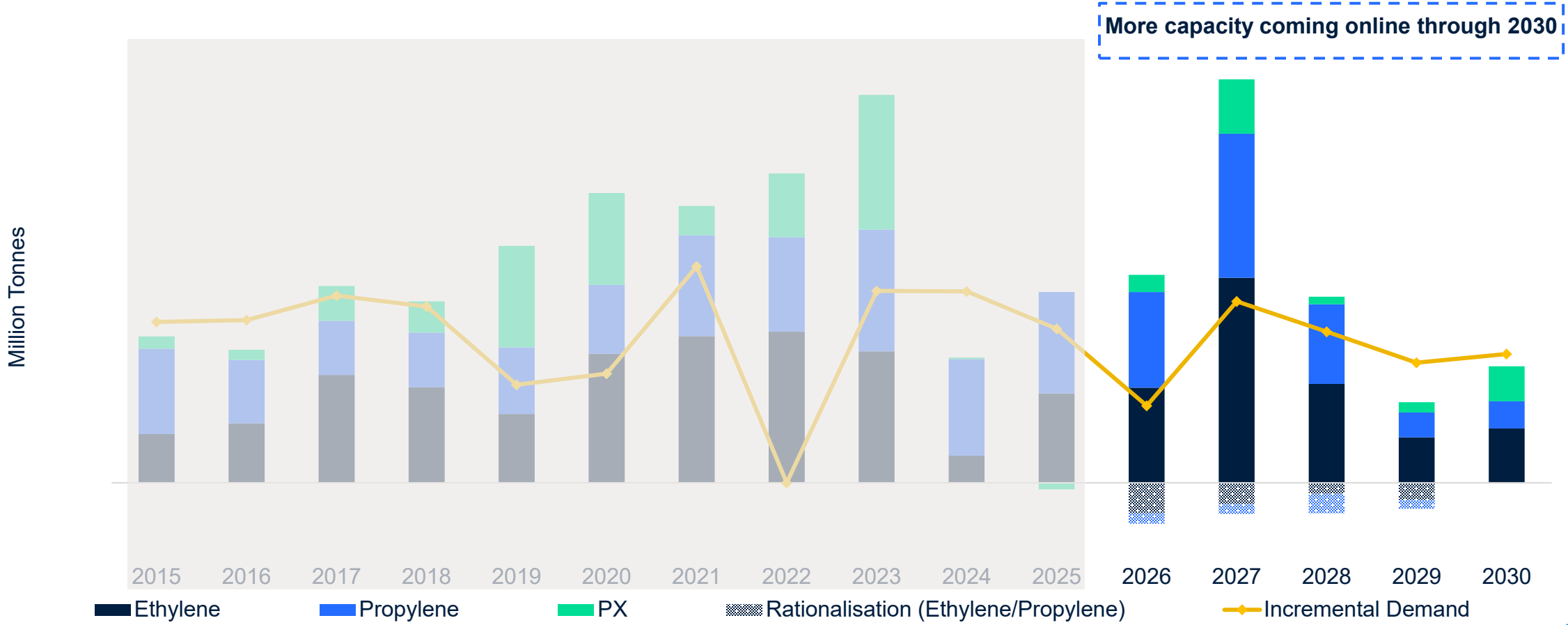
Chinese producers adjusted refinery runs to prioritize essential transportation fuels over petrochemical feedstocks, balancing national energy security against restricted crude imports.

Source: ICIS Supply & Demand Database

Widening gap between supply and demand suggests that further rationalization is required beyond currently announced closures to stabilize industry margins

Upcoming Global Capacity

Global Incremental Capacity vs Incremental Demand (2015-2030), million tonnes

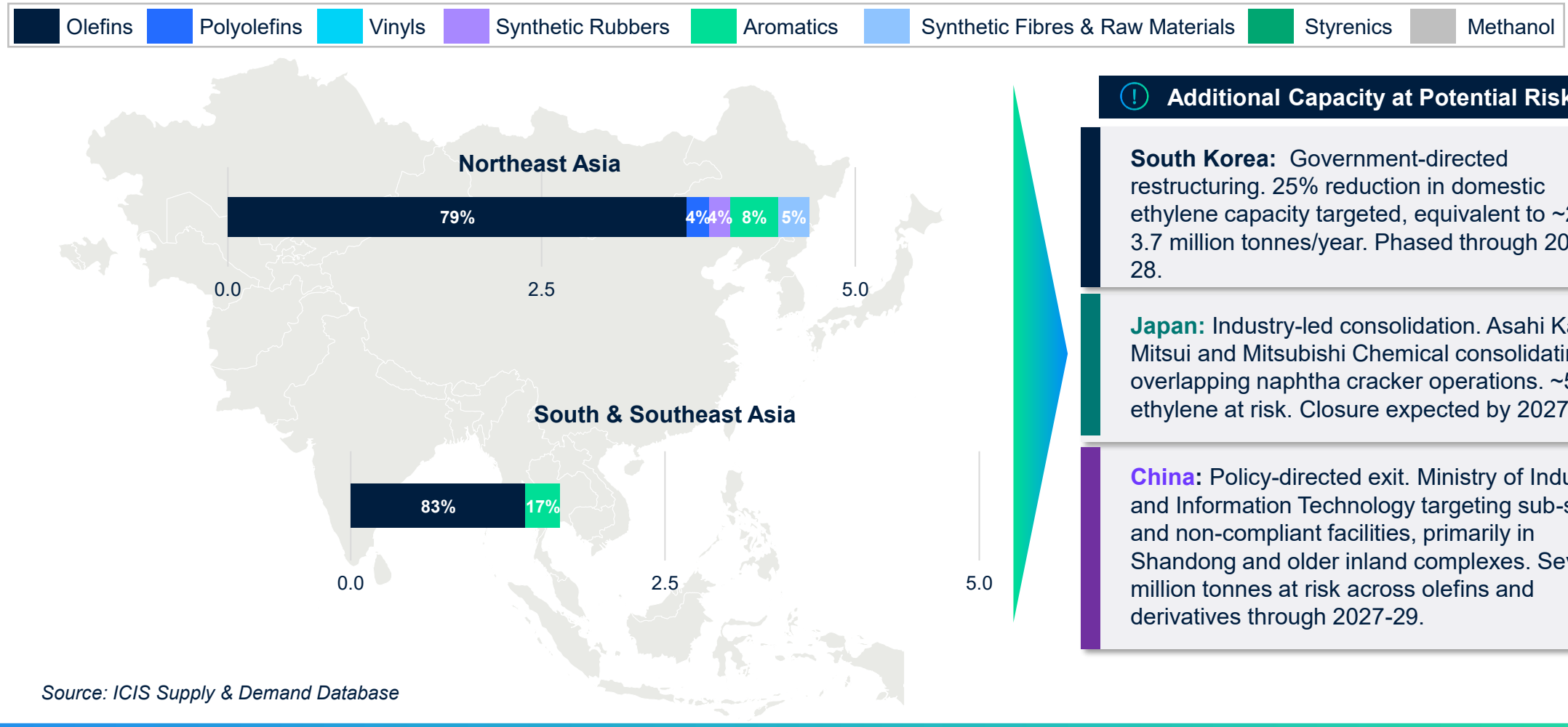


Source: ICIS Supply & Demand Database

Capacity rationalisation in Asia is accelerating, with planned closures concentrated in higher-cost naphtha-based operations

Accelerating Capacity Rationalizations

Upcoming Asian Capacity Rationalisation (2026-2030), million tonnes



Additional Capacity at Potential Risk

South Korea: Government-directed restructuring. 25% reduction in domestic ethylene capacity targeted, equivalent to ~2.5 to 3.7 million tonnes/year. Phased through 2026-28.

Japan: Industry-led consolidation. Asahi Kasei, Mitsui and Mitsubishi Chemical consolidating overlapping naphtha cracker operations. ~500kt ethylene at risk. Closure expected by 2027-28.

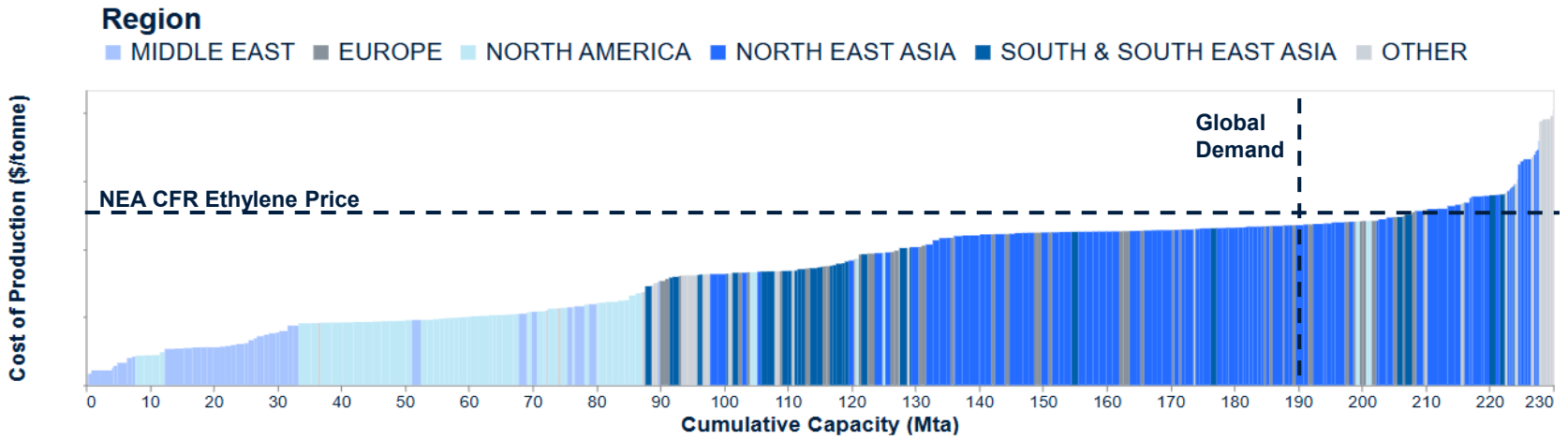
China: Policy-directed exit. Ministry of Industry and Information Technology targeting sub-scale and non-compliant facilities, primarily in Shandong and older inland complexes. Several million tonnes at risk across olefins and derivatives through 2027-29.

Source: ICIS Supply & Demand Database

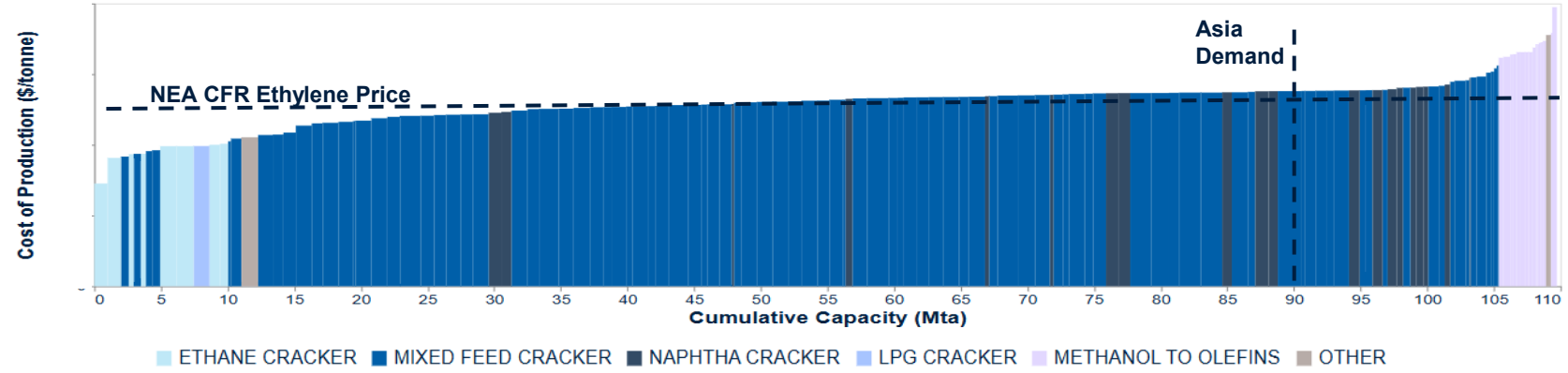
Feedstock cost advantage defines the competitive divide in global ethylene, with Middle East and North American producers structurally advantaged

Ethylene Cost Curve by Region and Production Route, 2025

Global 2025 Ethylene Cost Curve (Brent Oil = $69/bbl, constant)



Asia 2025 Ethylene Cost Curve by Production Route



Source: ICIS Consulting

1. **ME and North America have advantaged feedstock (ethane/LPG) leading to 1st quartile performance**
2. **Higher-cost producers in Europe and Asia face mounting margin pressure, with many operating near/above benchmark price**
3. **Asian producers sit broadly in the 2nd and 3rd quartiles, underpinned by mix-feed cracking, however future competitiveness closely tied to feedstock availability and diversification.**

Petrochemicals at Strategic Crossroads: Operational Resilience and Sustainability Transition as Imperatives for Commercial Relevance

From Disruption to Direction

OPERATIONAL FLEXIBILITY & RESILIENCE

Building a supply chain that holds under pressure.

Diversify feedstock origins
Asian naphtha supply is heavily concentrated through a single strait.

Build mixed-feed capability
Operators who could switch feedstock kept running.

Integrate upstream where scale allows
Integrated operators had a buffer. Others did not.

Rethink inventory strategy
Lean inventory buffers left no runway when supply stopped.

Rationalise deliberately
Assets that cannot survive a shock will not survive the next cycle.

SUSTAINABILITY TRANSITION

Operating sustainably in a transforming world.

Circular and bio-feedstocks
Reduces supply chain exposure and meets carbon and customer compliance needs.

Chemical recycling
Domestic plastic waste as feedstock reduces dependence on imported crude-based naphtha.

Mechanical recycling integration
Recycled polymers require no naphtha. No naphtha means no feedstock supply risk.

Carbon reduction at the cracker
A lower-carbon asset base is more fundable, more defensible and longer-lived.

Regulatory compliance as market access
Compliance is not a cost. It is the price of staying in the markets that matter.

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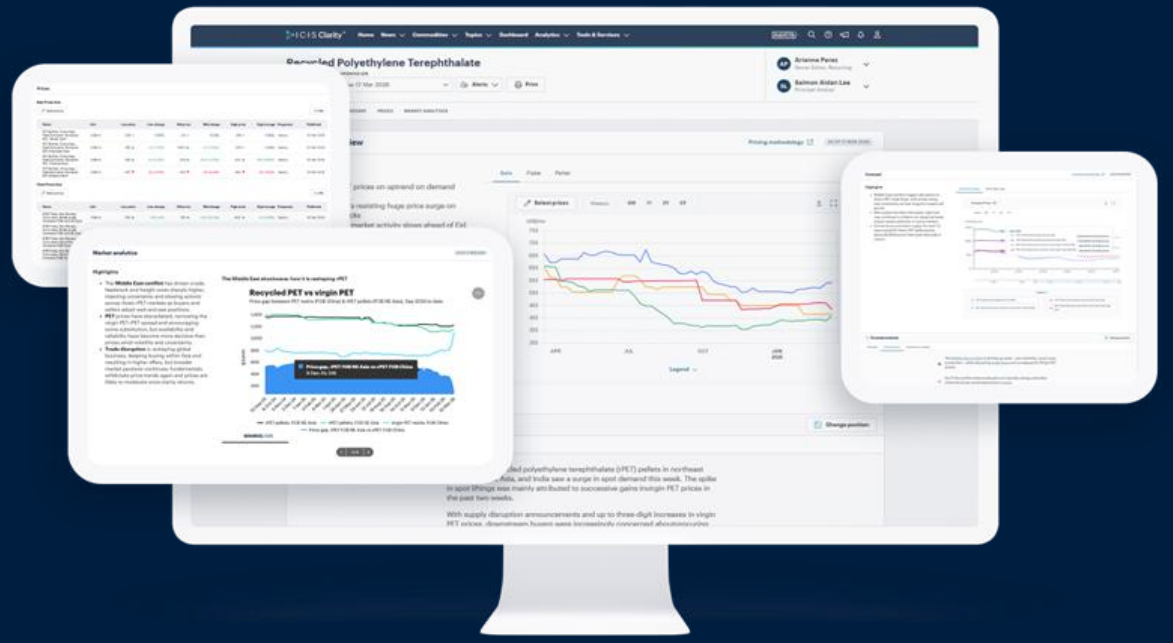

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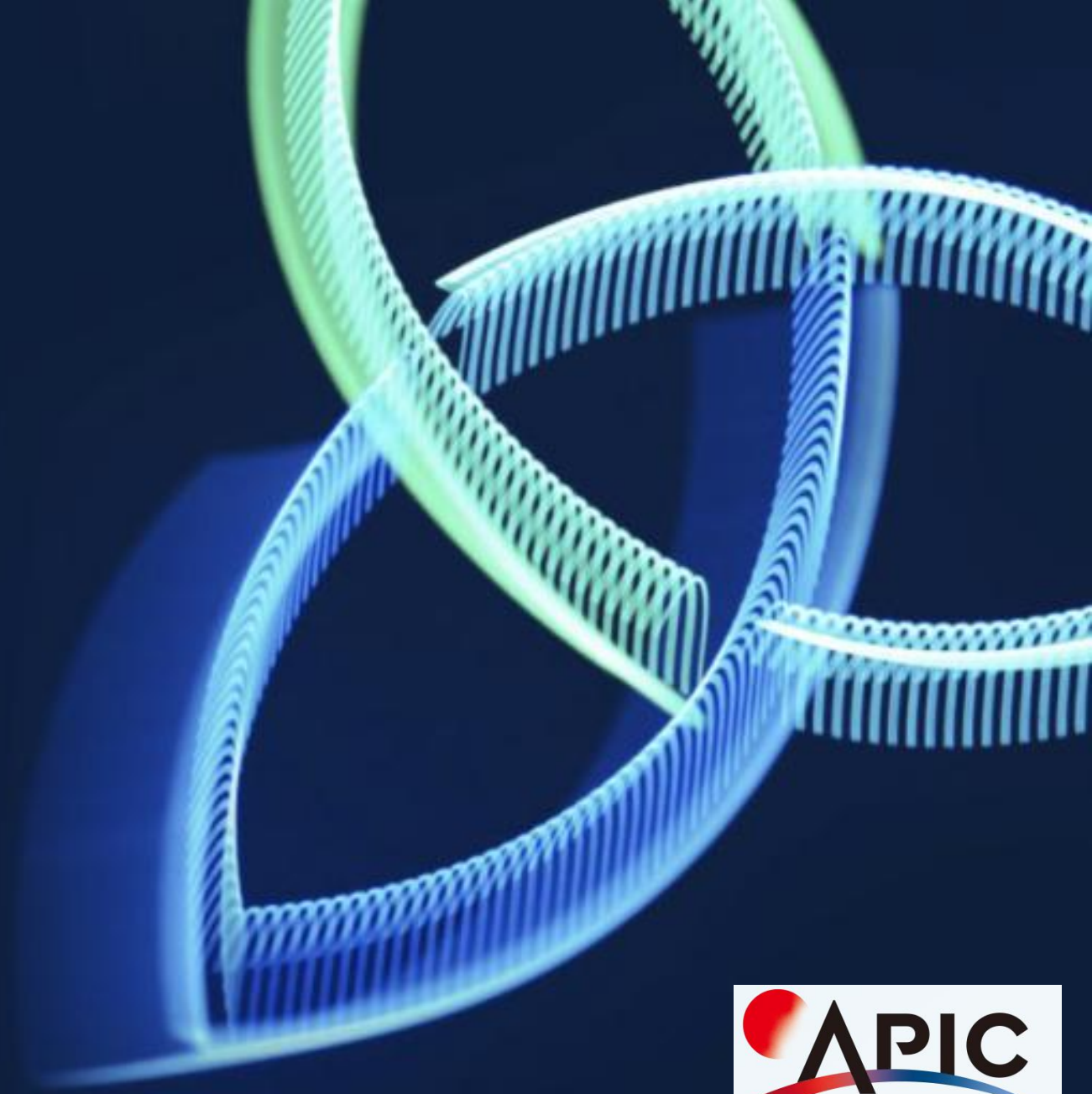
Circular Economy and Sustainability Trends

Helen McGeough

Global Lead Plastics Recycling & Sustainability, ICIS



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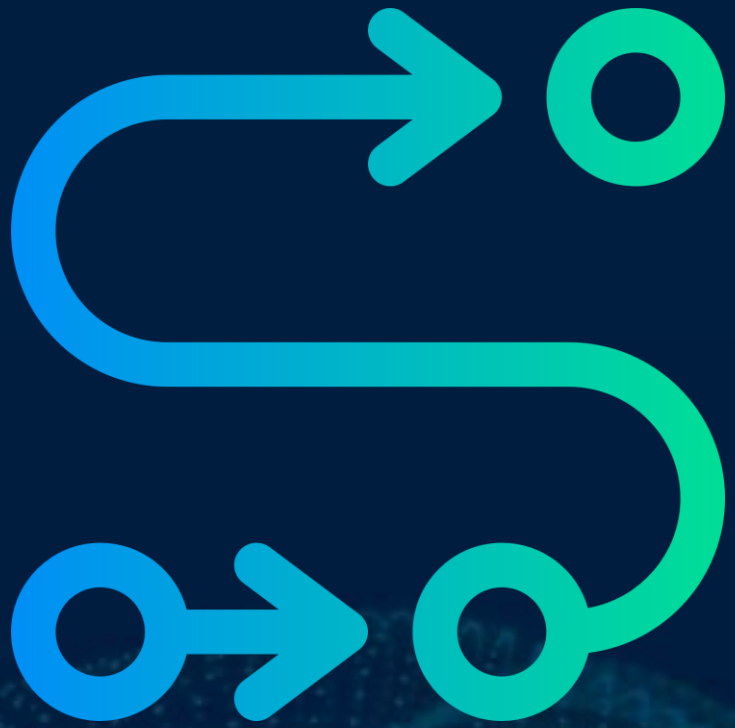
01 Circular Economy – why?
02 What are the options today?
03 And for the future



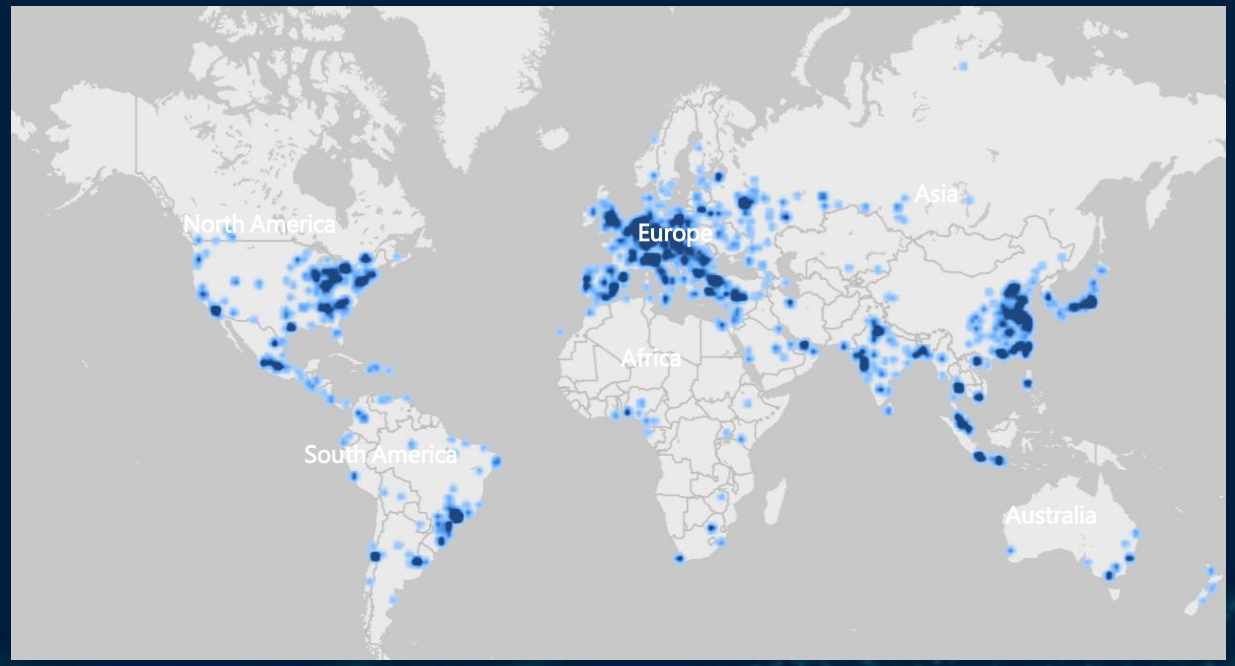
Resource

Waste

Mechanical recycling is relatively established in comparison to nascent but fast developing chemical recycling industry

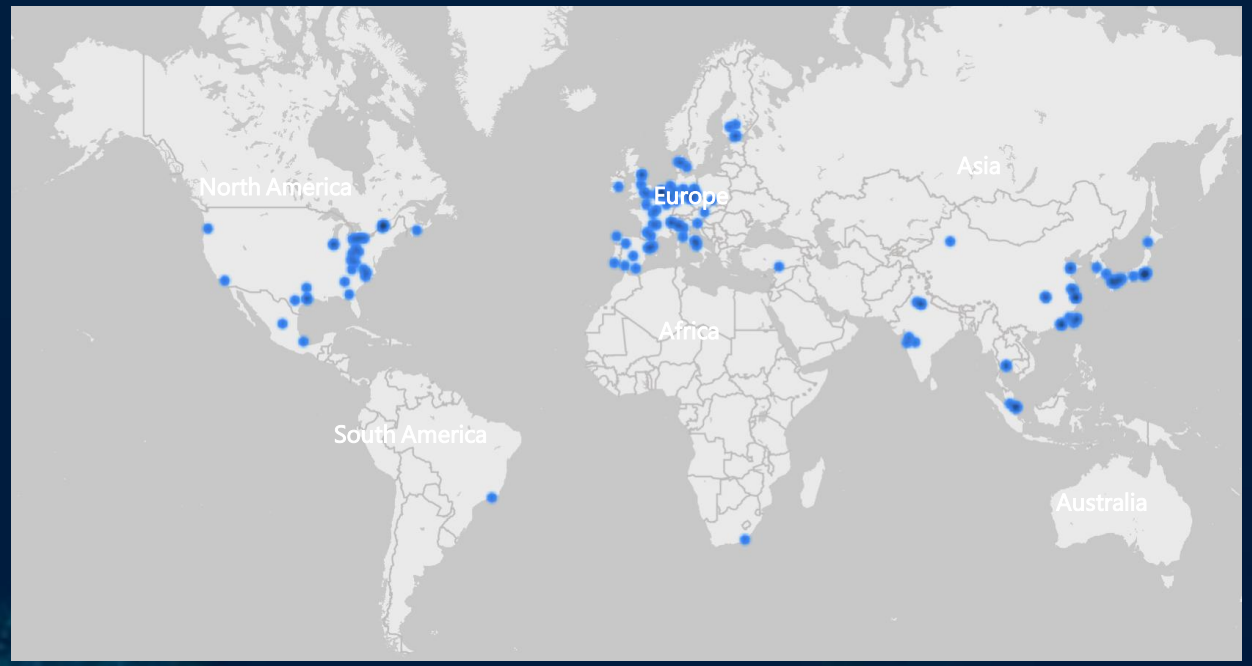
Asia dominates installed mechanical recycling capacity, increasing share in chemical recycling projects

Mechanical Recycling Supply Tracker



Mechanical recycling plants*, operating and construction***
~2400 plants globally

Chemical Recycling Supply Tracker

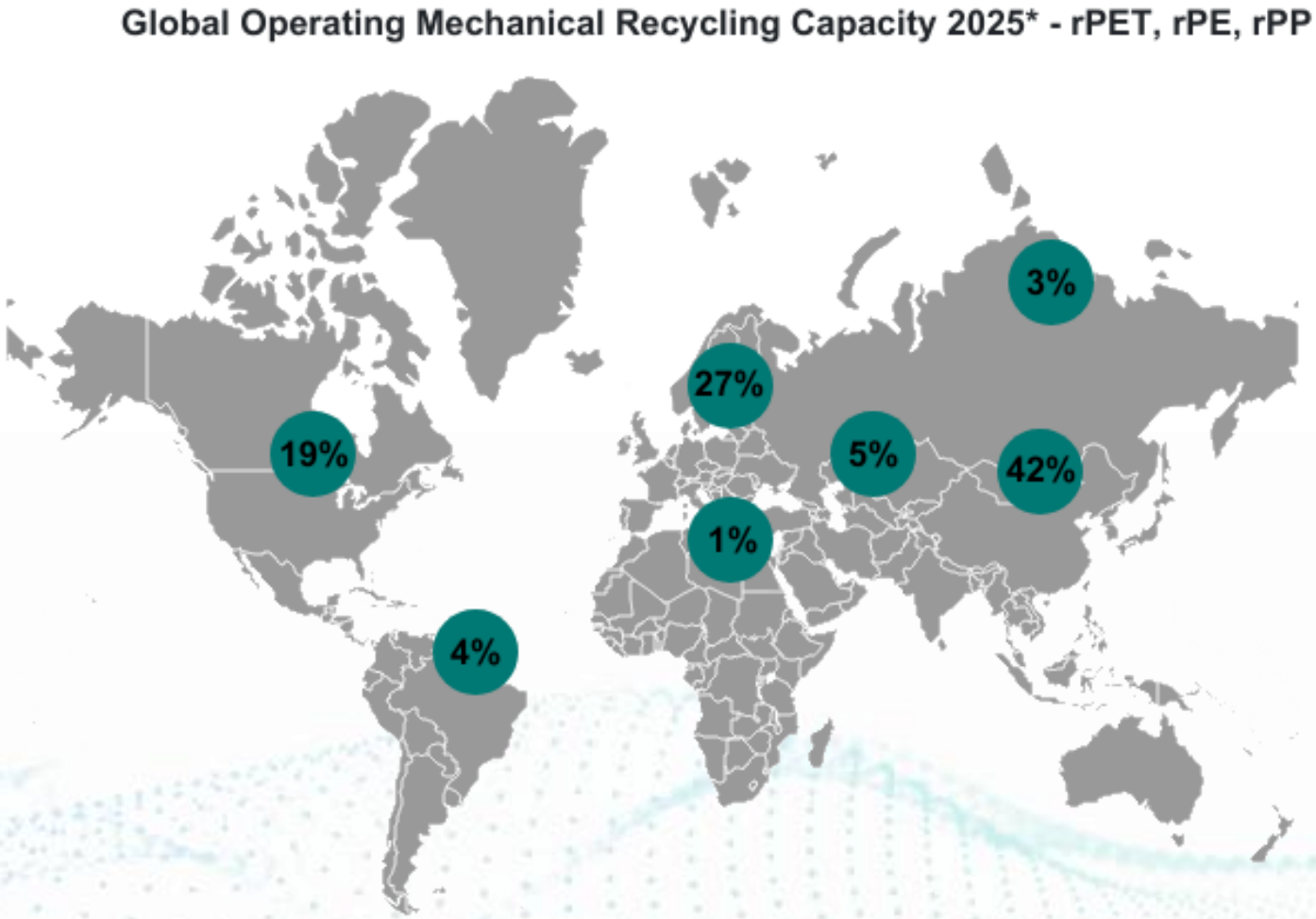


Chemical recycling and dissolution plants**, operating and construction***
~160 plants globally

* *Includes PET, PE and PP capacities*
** *Chemical recycling includes pyrolysis-based projects (all types, excludes tyre pyrolysis), glycolysis, hydrolysis, methanolysis projects; for all relevant polymers and all plant scales (both pre-commercial and commercial)*
*** *Includes commissioning*

Source: ICIS Recycling Supply Tracker – Mechanical, 2026; ICIS Recycling Supply Tracker – Chemical, 2026

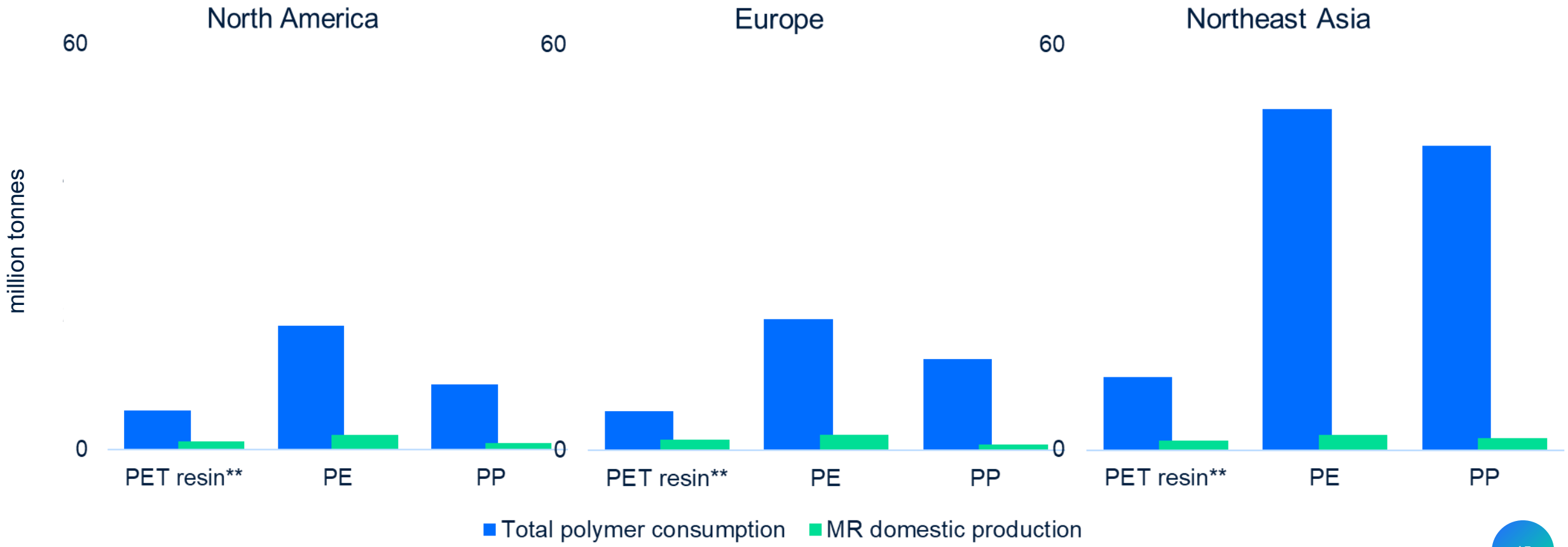
Global installed mechanical recycling capacity remains dominated by Asia followed by Europe and North America



Source: Recycling Supply Tracker – Mechanical, 2025

Recycled polyolefin market penetration lags behind rPET in all regions with rPP the least developed market

Recyclate output does not exceed 12% of domestic polymer consumption for rPE or rPP in any region



*Europe includes both EU, non-EU countries and Turkey

** PET resin includes bottle grade resin, which is most commonly used in bottle and container packaging

Source: ICIS Supply & Demand Database and Recycling Supply Tracker – Mechanical, 2026

Regional legislation can impact global recycling markets

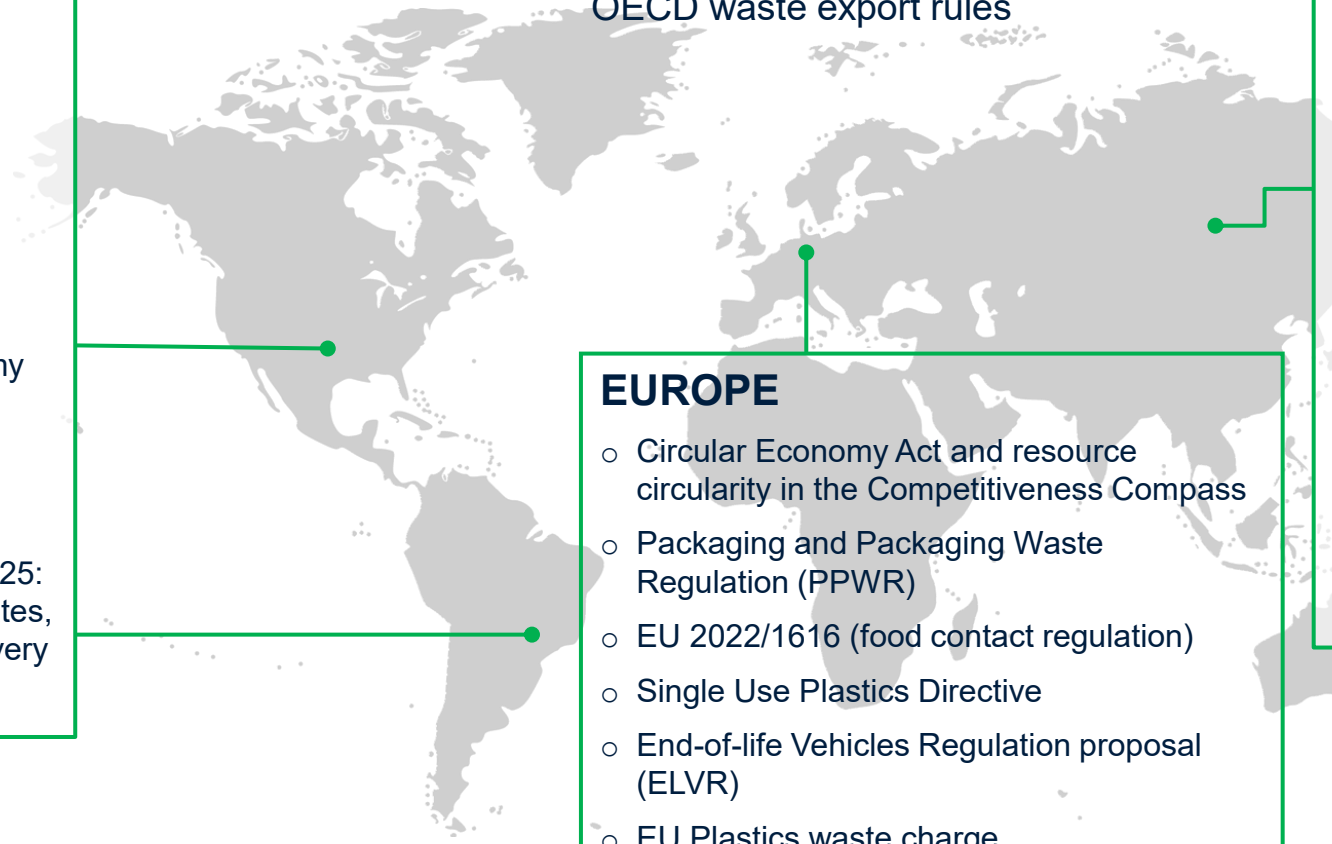
It drives long-term demand but also increases compliance costs for companies and determines need to reshape procurement strategies in the increasingly complex macro environment

AMERICAS

- Recycling and composting accountability Act
- Recycling infrastructure and accessibility Act
- US state EPR and PCR requirements
- CA provincial EPR
- CA Action Plan on Zero Plastic Waste
- Mexico Circular Economy Law (LGEC); binding principles for circular design, waste reduction and EPR
- Brazil decree 12,688/2025: recycled content mandates, binding targets for recovery and reuse

GLOBAL

Basel convention
UN Global Plastics Treaty
OECD waste export rules



EUROPE

- Circular Economy Act and resource circularity in the Competitiveness Compass
- Packaging and Packaging Waste Regulation (PPWR)
- EU 2022/1616 (food contact regulation)
- Single Use Plastics Directive
- End-of-life Vehicles Regulation proposal (ELVR)
- EU Plastics waste charge
- Country specific plastic packaging taxes

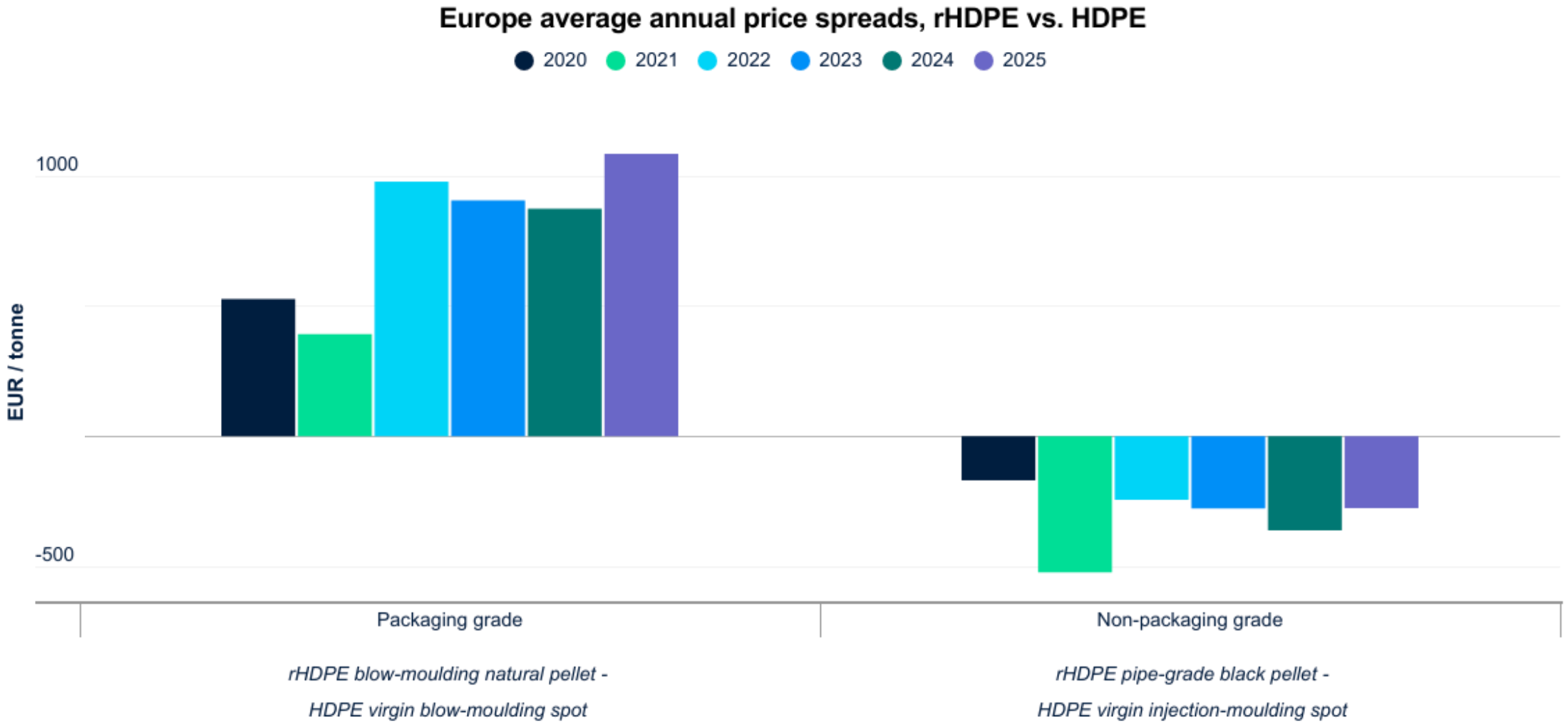
ASIA PACIFIC

- Country specific EPR, and SUP Bans
- Expanding DRS in many Asian jurisdictions
- Plastic waste trade restrictions in almost all countries
- Growing acceptance of food-contact applications, including China possibly in 2026
- Mandates for rPET use in most jurisdictions, including India from 2025
- China - New national standards related to recycled plastics being implemented in 2026
- ASEAN-wide / coordinated plans and actions, e.g.
  - ASEAN Municipal Solid Waste Management Enhancement (AMUSE)
  - Regional Action Plan for Combating Marine Debris

** Not exhaustive list which includes both adopted and drafted legislation*

The EU example demonstrates that legislation can drive price premiums for high quality recyclate

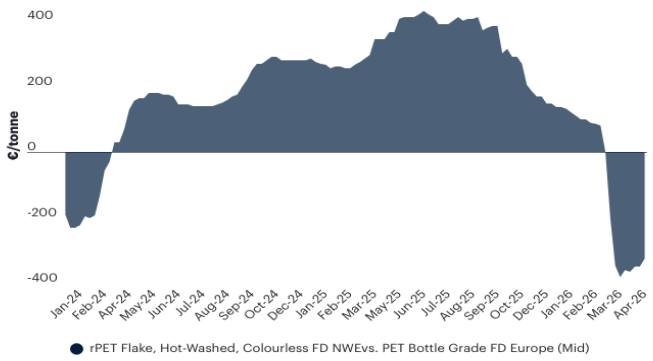
Case study for European rHDPE illustrating the impact of PPWR mandates on packaging grades



Source: ICIS Pricing

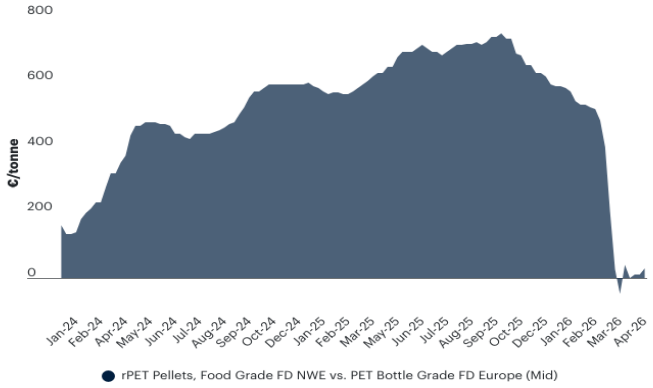
ME Conflict = Positive impact for recycling

PET bottle grade resin vs. rPET colourless flake



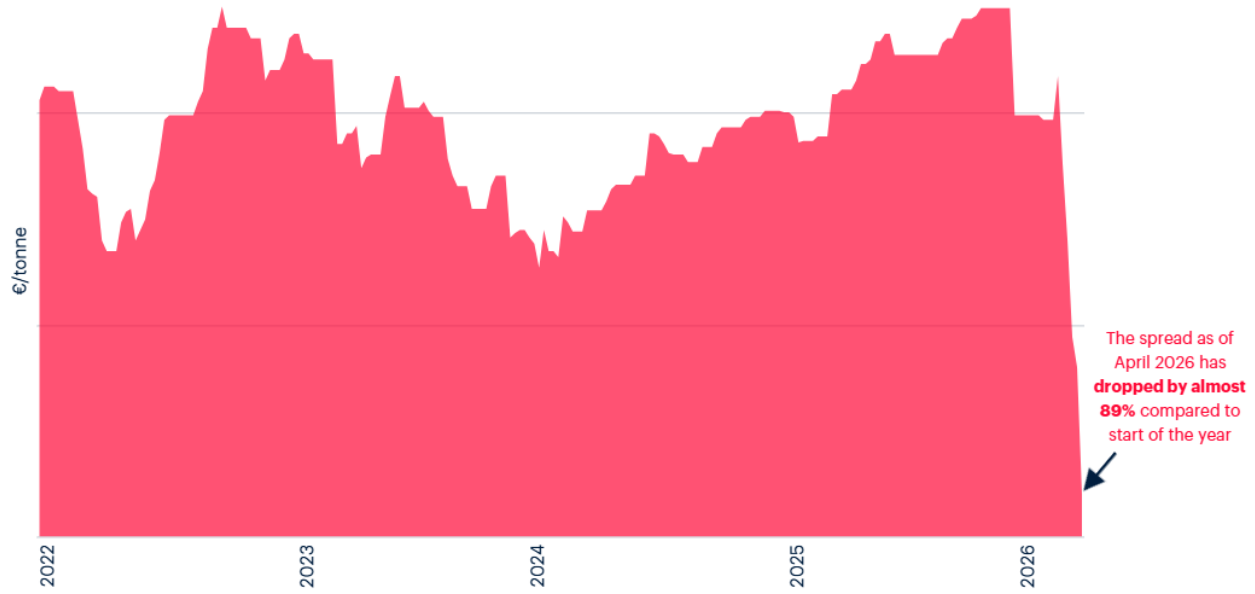
Source: ICIS

PET bottle grade resin vs. rPET food-grade pellet



Source: ICIS

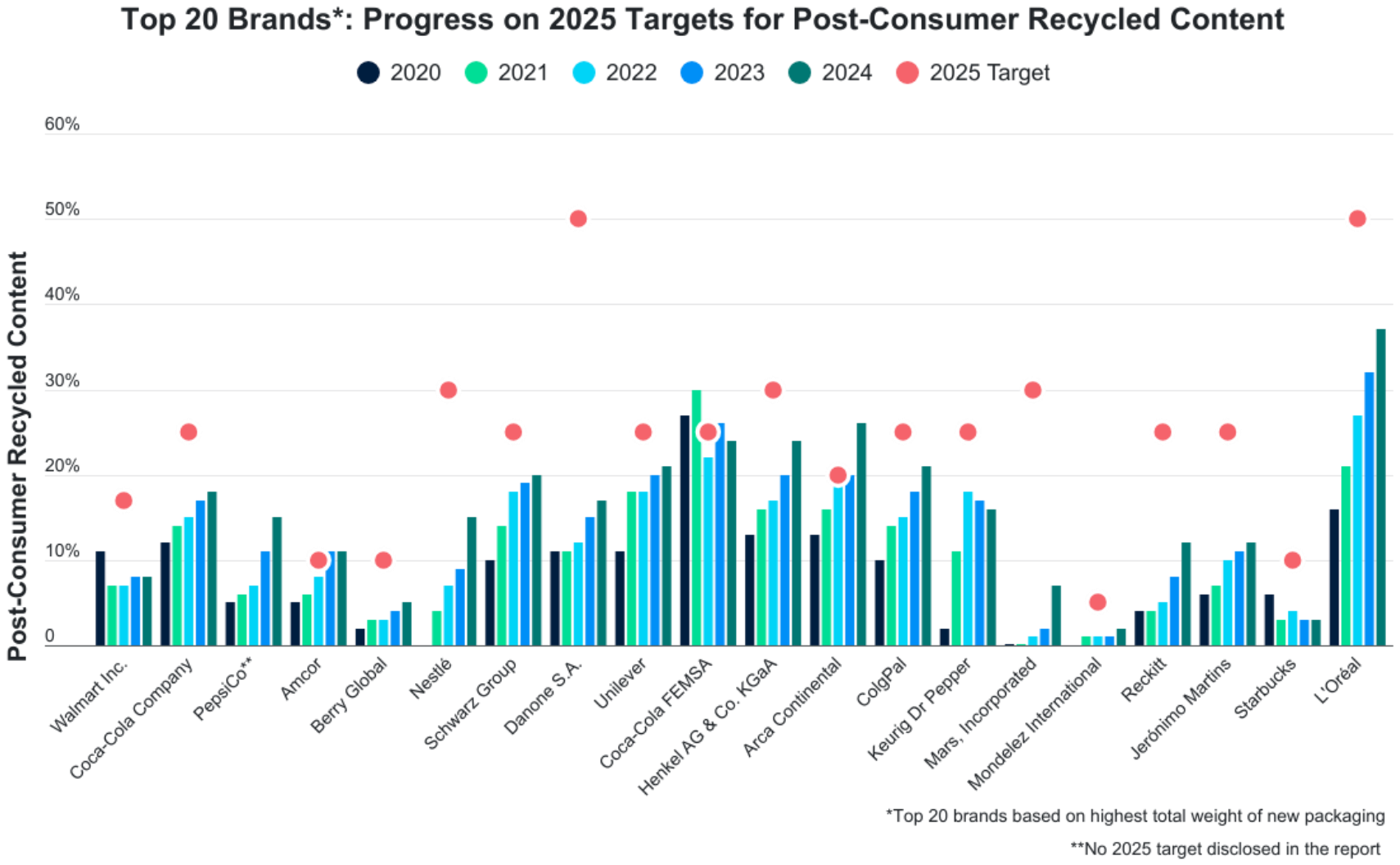
rHDPE natural packaging grade to virgin spread since 2022



SOURCE: ICIS Pricing Data

The sustainability agenda is competing with tough macroeconomic conditions

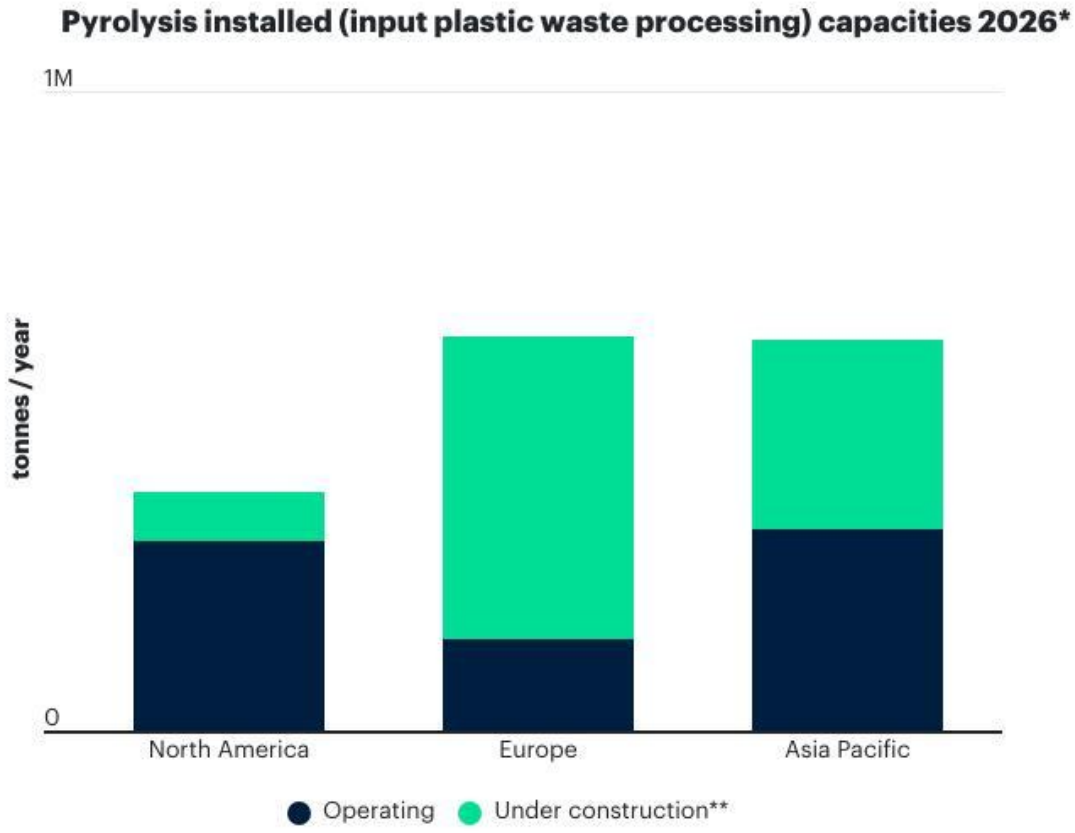
Global brands lagging in their commitments while many recyclers struggle to deliver financial results



Source: Ellen MacArthur Foundation Global Commitment Progress Reports 2025, adapted by ICIS

Chemical recycling can potentially provide an additional boost but currently it's a nascent market

Recycled content mandates for contact-sensitive and high specification applications will drive demand for virgin-like polymers



* *As of May 2026, excluding pyrolysis capacities targeting monomaterial feedstocks and co-processing with coal in coke ovens*

** *Including commissioning*

Source: ICIS Recycling Supply Tracker - Chemical

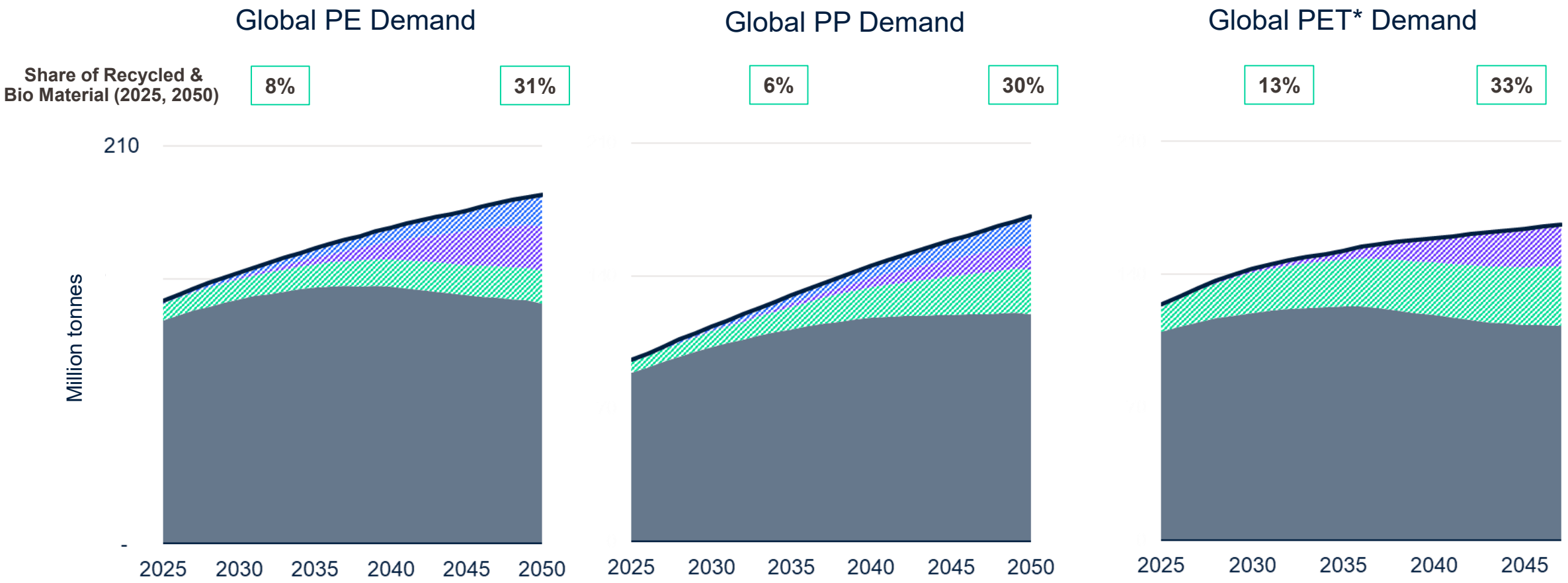
Key barriers to growth of chemical recycling:

- Regulatory uncertainty e.g. mass balance
- Access to suitable quality waste
- Timeframe for technology to scale
- Challenging financing and investment environment

CR output 2030 = Time for capacity build x Operating rates x Yield x MB calcs

Market opportunities in for different supply routes will depend on policy incentives and availability of feedstocks in each region

Demand of Key Polymers – an ICIS scenario (pre-Iran)



Source: ICIS Supply and Demand database, ICIS Analysis 2025

**Resin, film & fibre*

***Polymers produced from bio-naphtha and/or bio-LPG, also known as 'bio-attributed*

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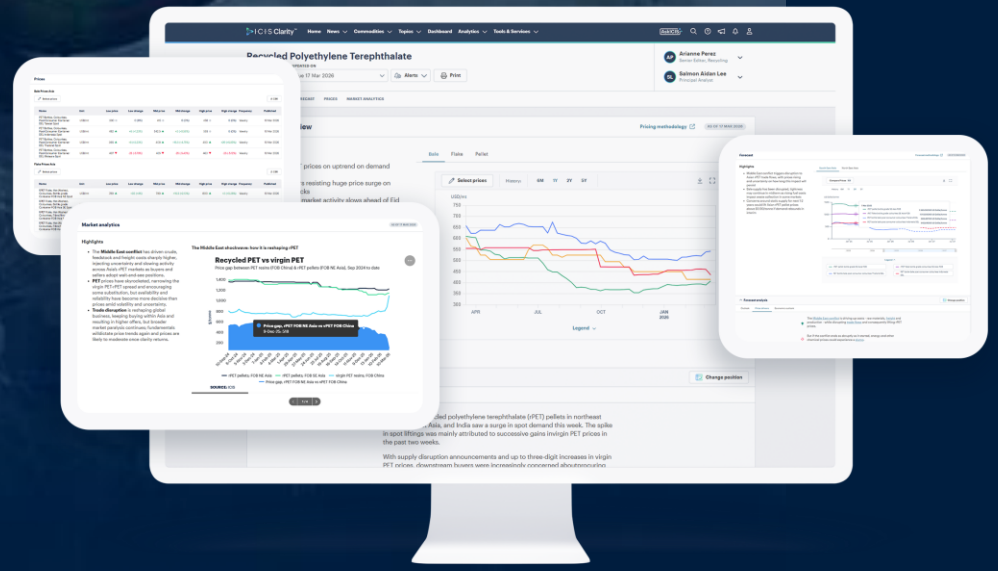

See how price shocks move across virgin and recycled plastics

As crises like those in the Middle East disrupt energy, logistics and feedstock, virgin plastic prices are rising fast. At the same time, dynamic regulatory pressure and downstream demand are accelerating the shift: recycled polymers are no longer optional or just sustainable choice, they're essential to the supply mix.

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