Chlor-Alkali's Crossroads (2026-2030)

Restructuring supply, redrawing trade maps and striving for competitiveness

Bernard Law
February 11, 2026, Delhi

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- Fertilizers
- Agriculture
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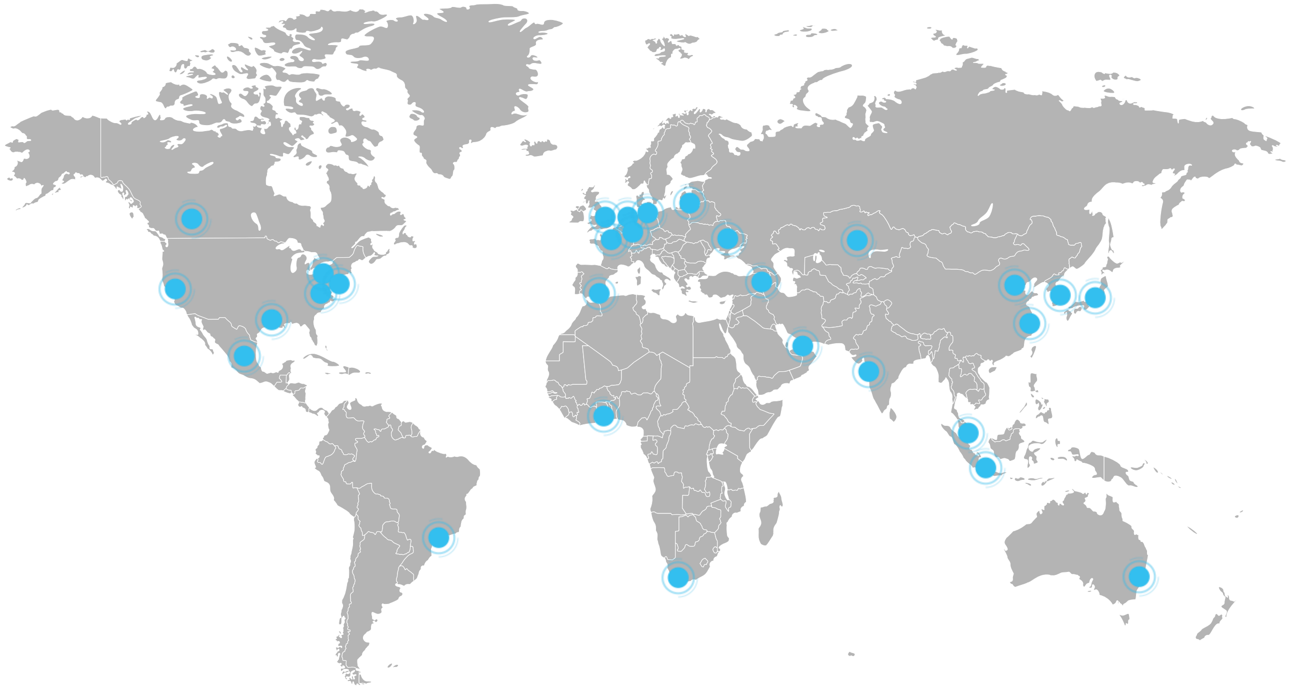
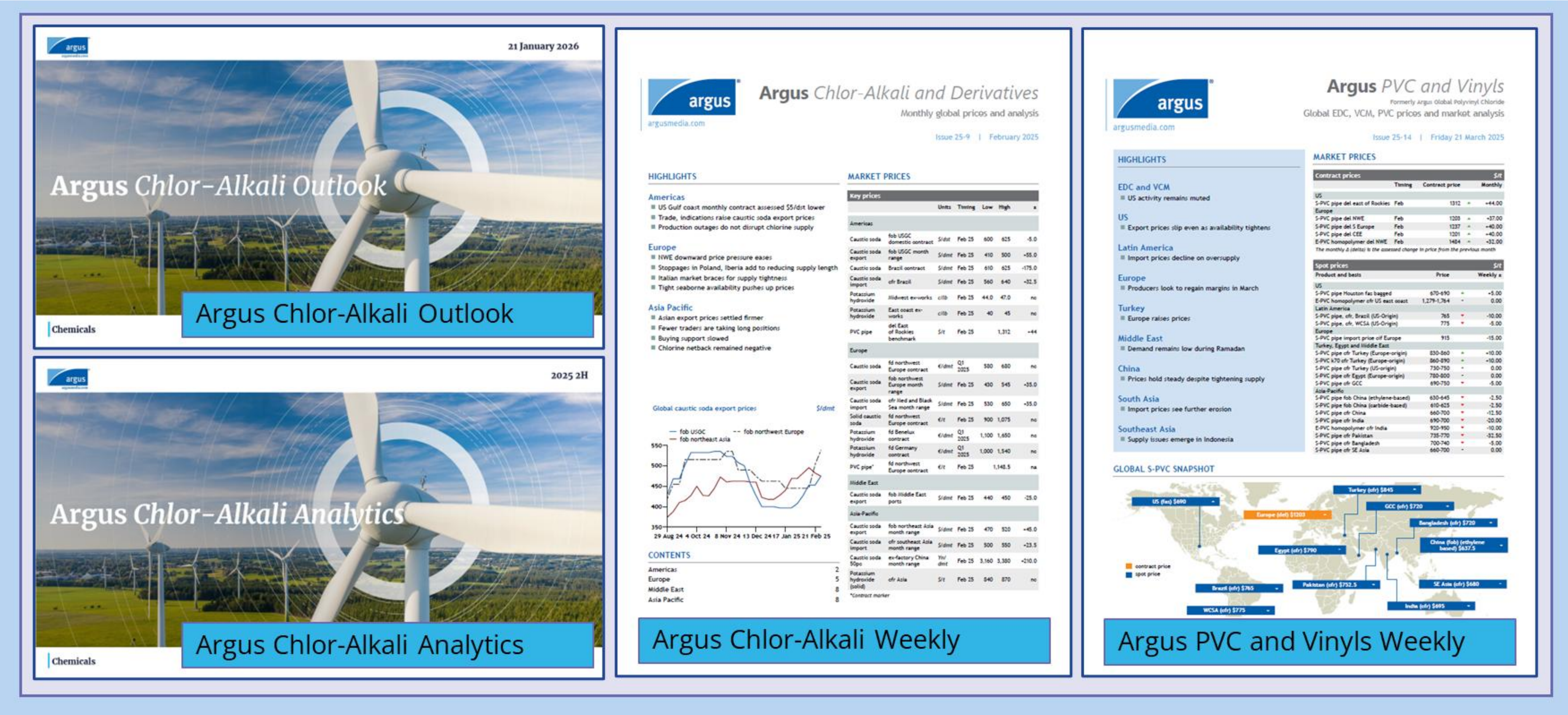
- Asia-Pacific LPG
- Coal
- European steel
- US and European environmental markets



Full suite of chlor-alkali and vinyls products



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Macro Snapshot – State of the industry

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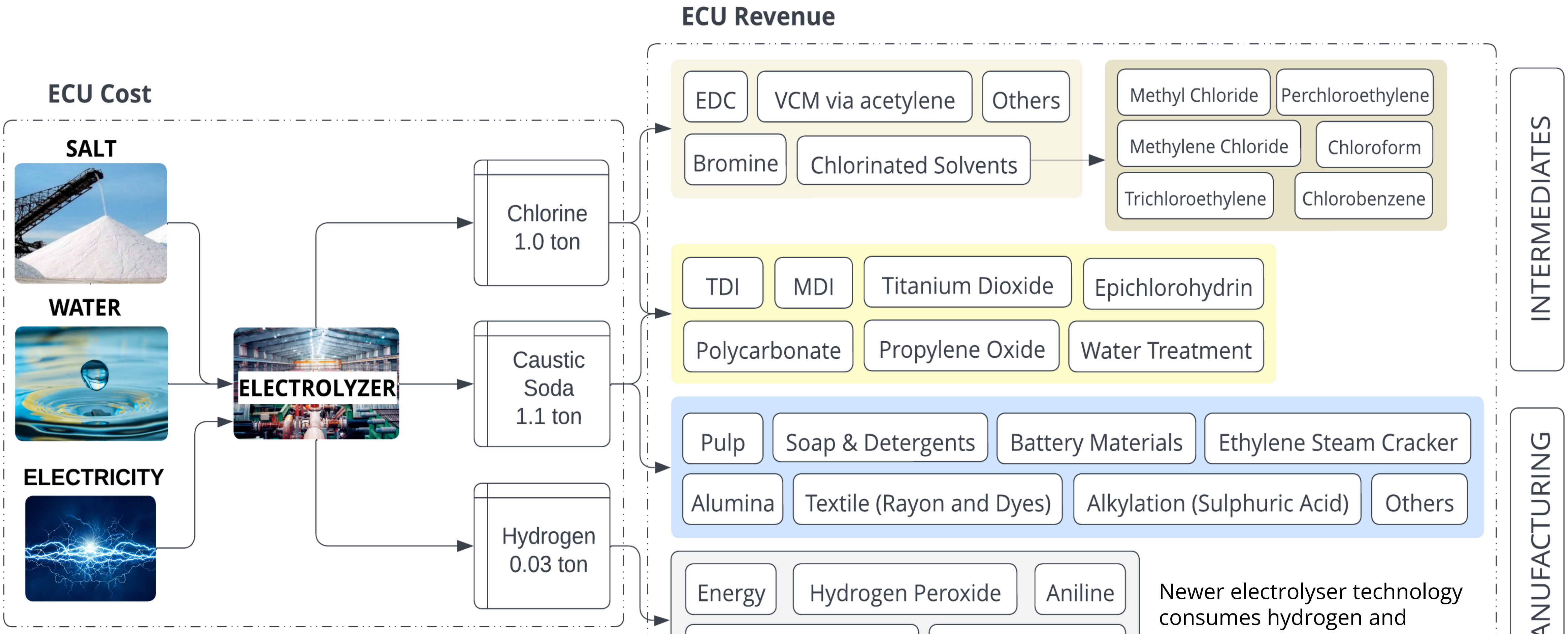
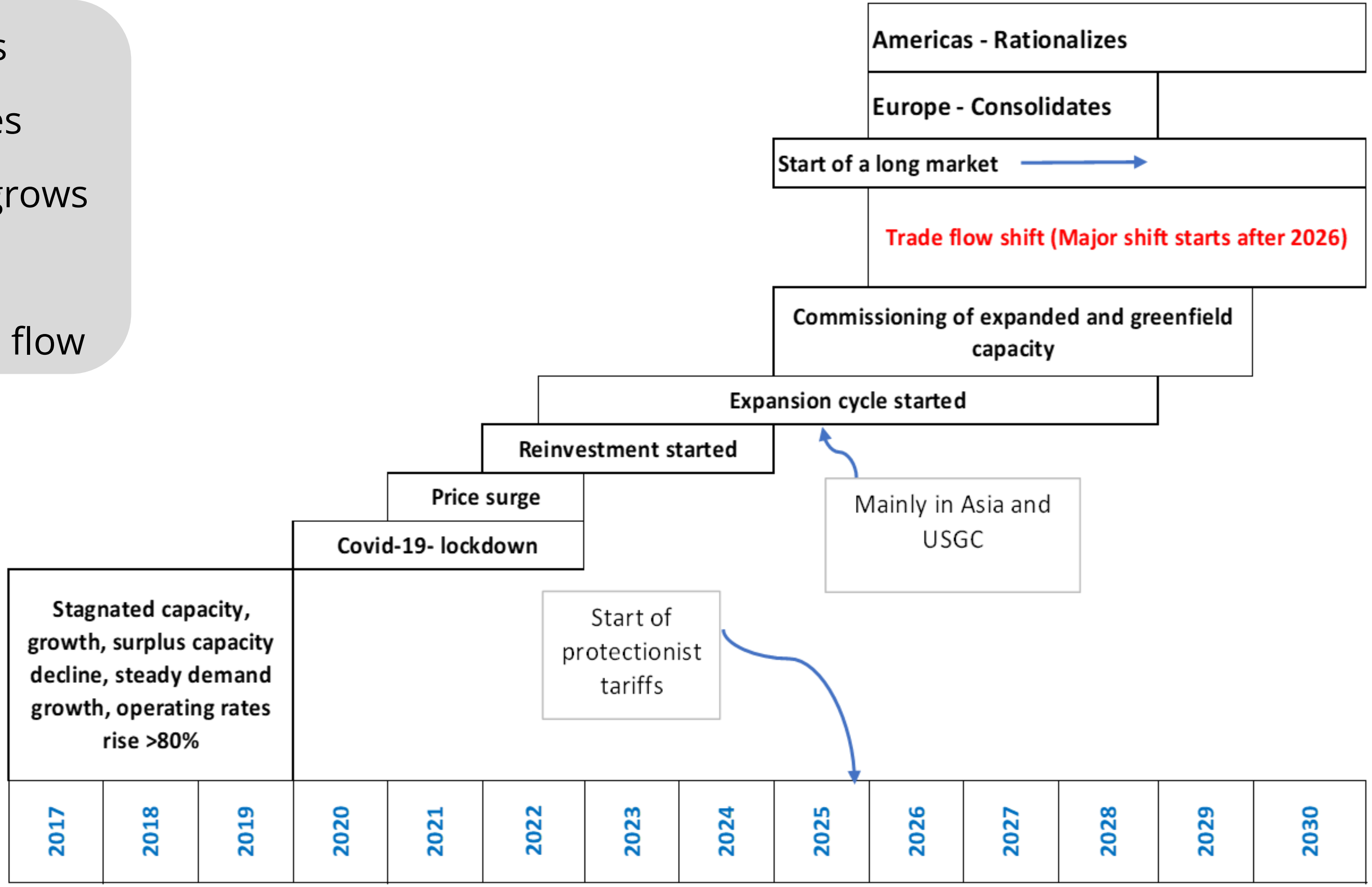
Electro-chemistry 101



1 ECU (Electro-Chemical Unit) = 1.0 Ton of Chlorine and 1.1 Ton of Caustic Soda

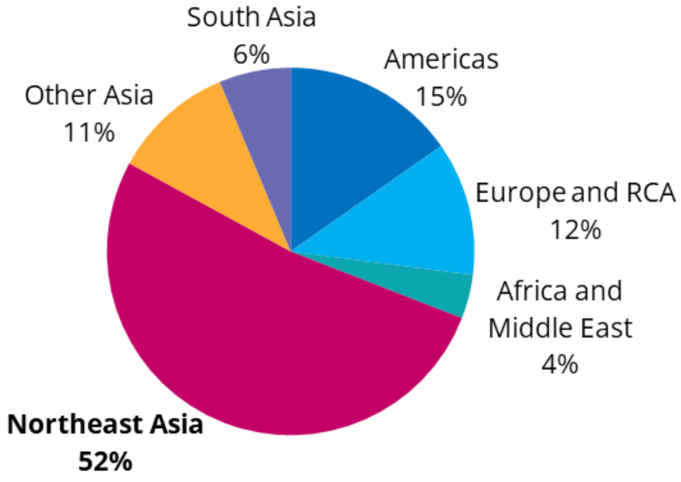
How will chlor-alkali industry evolve after 2025?

- Americas optimizes
- Europe consolidates
- Asia – adapts and grows
- Long market
- Major shift in trade flow

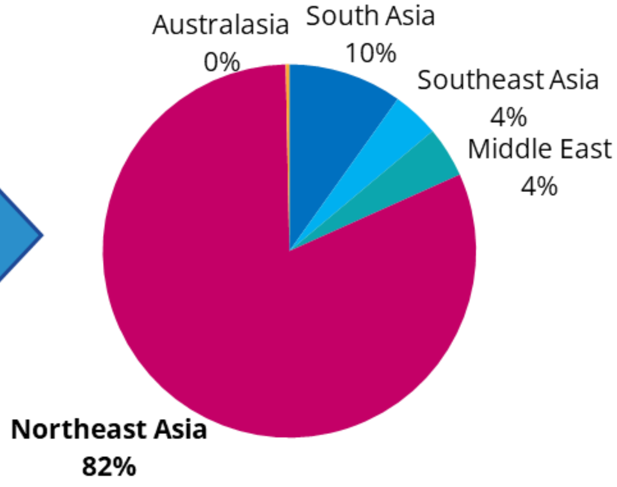


Macro snapshot: Caustic Soda

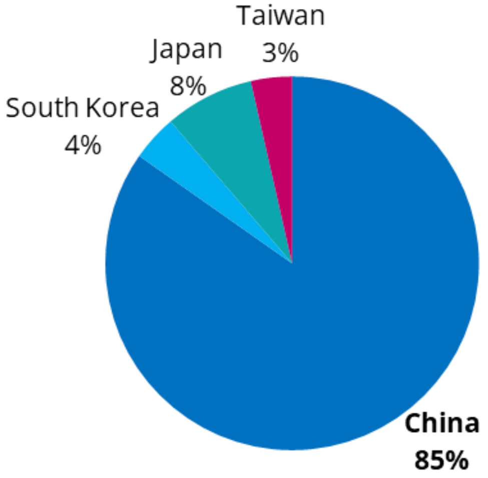
Capacity by region, 2025



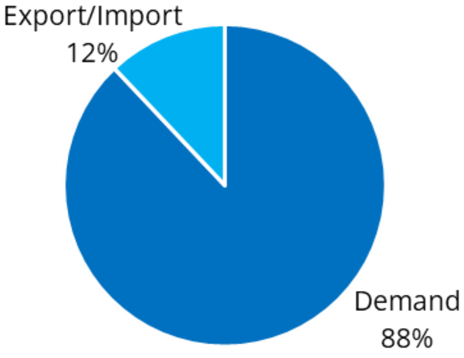
Asia-Pacific capacity by region, 2025



Northeast Asia capacity by country, 2025

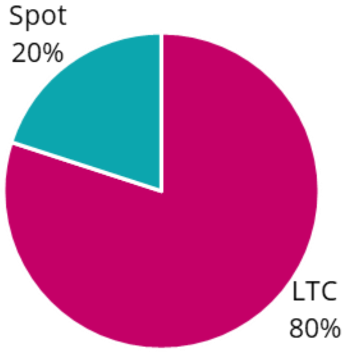


Global capacity utilization, 2025

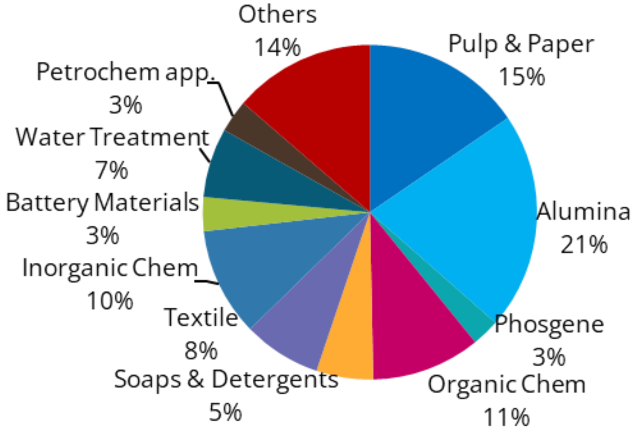


Total Capacity = 110.9mn dmt

Exports Allocation



Caustic Soda demand by derivative, 2025



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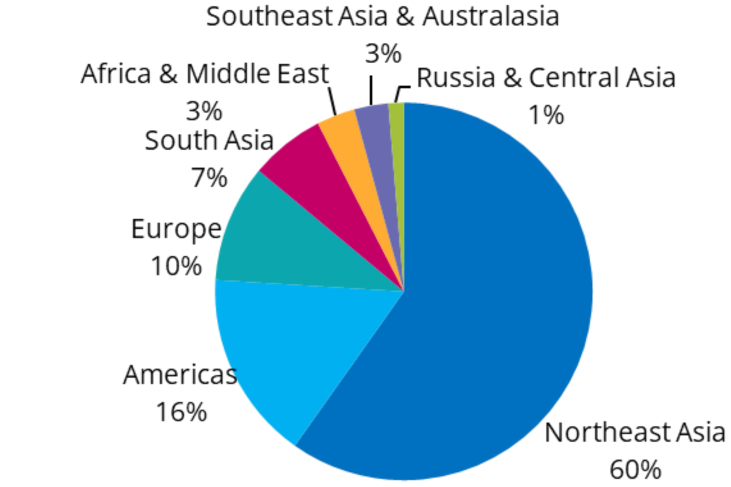
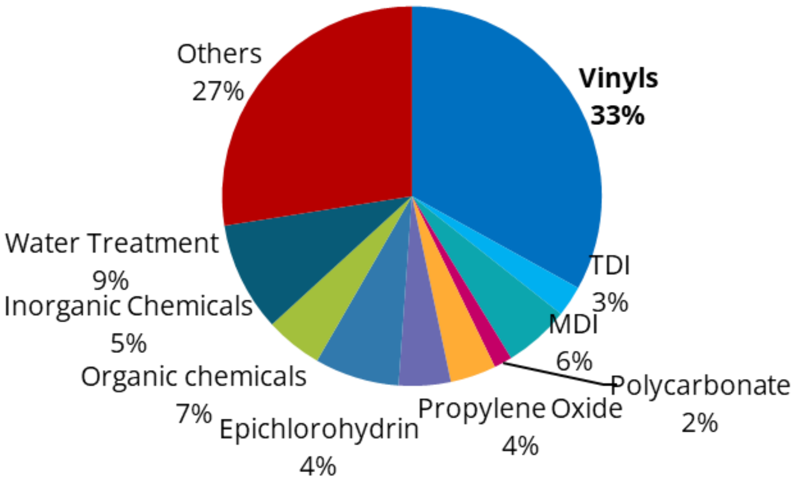
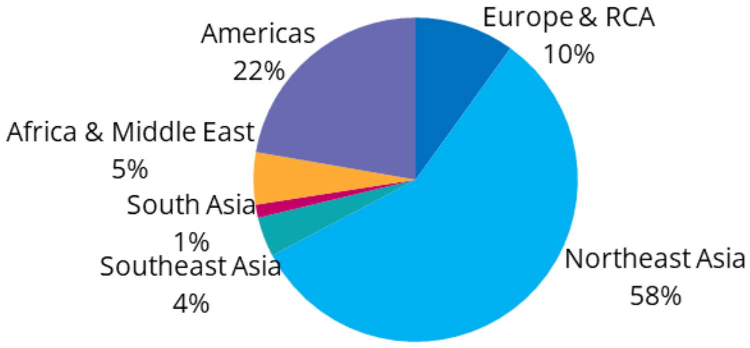
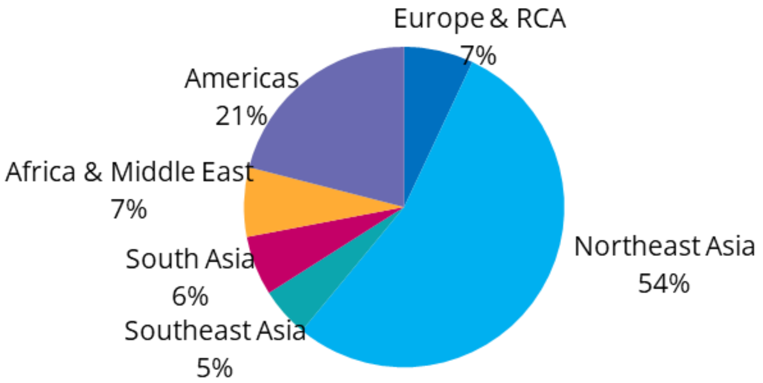
Macro snapshot: Chlorine









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Global supply-demand balance: Chlor-Alkali

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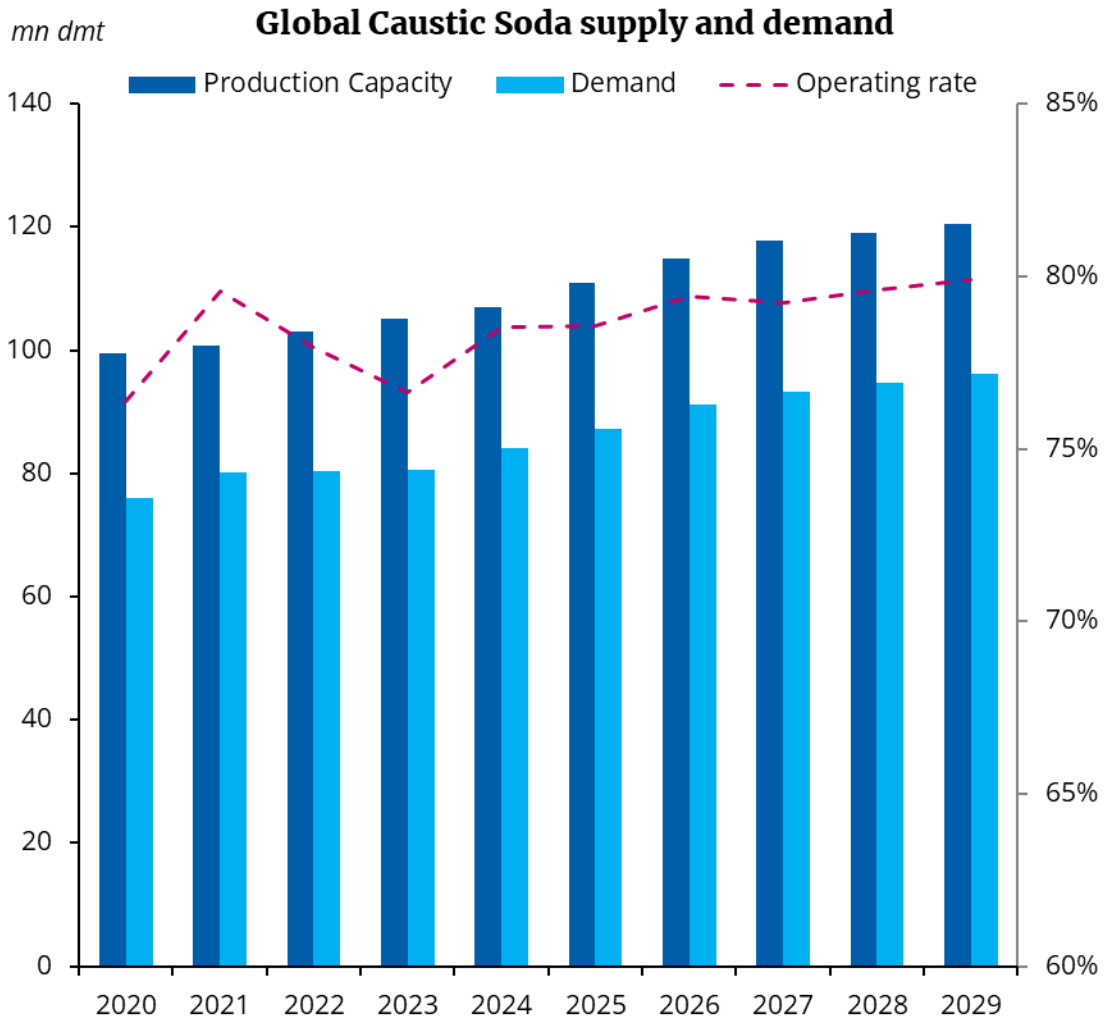
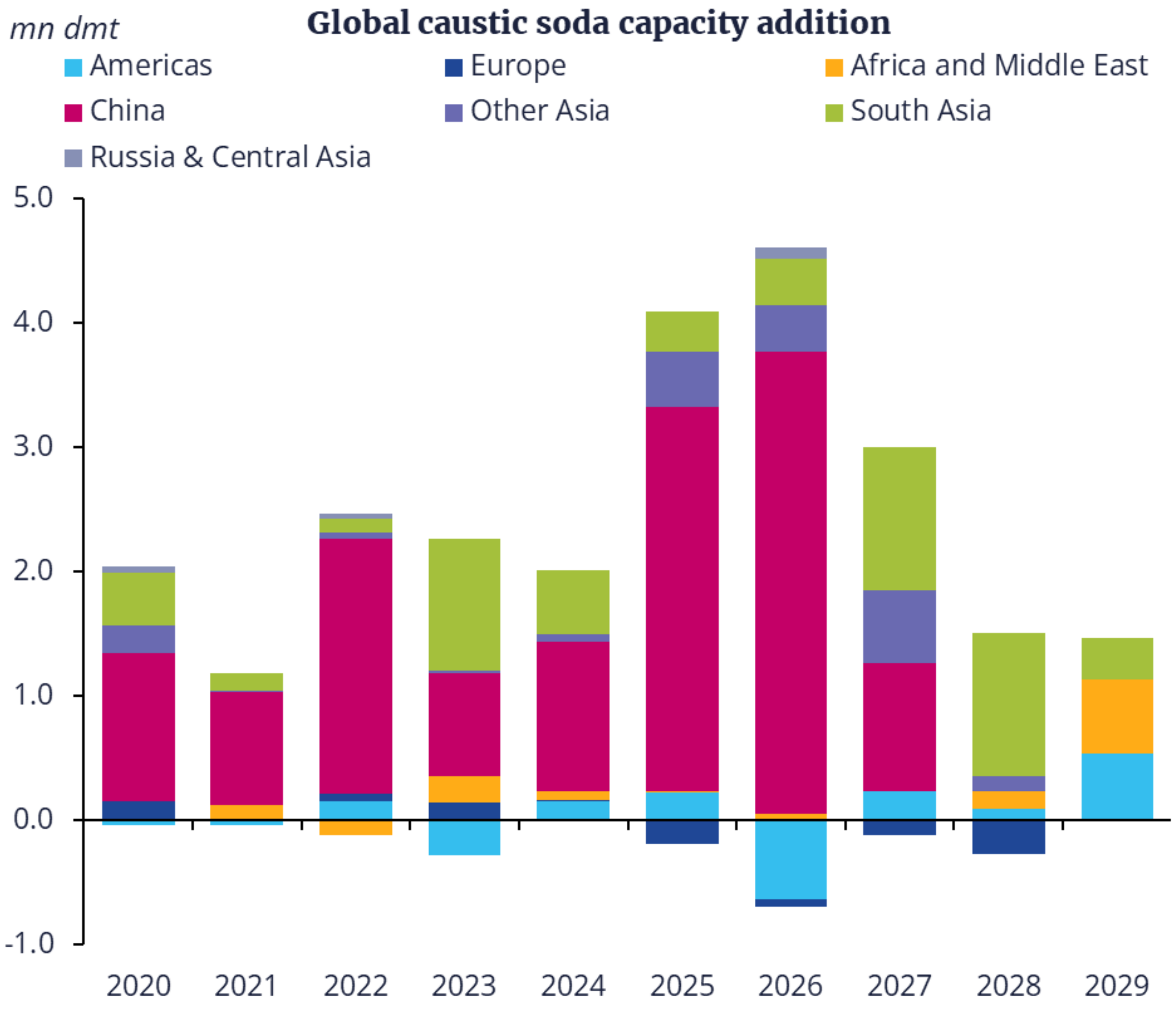
Global Caustic Soda Supply-Demand Balance





Source: Argus Media – Consulting Services

Europe: consolidates

European chlorine closures

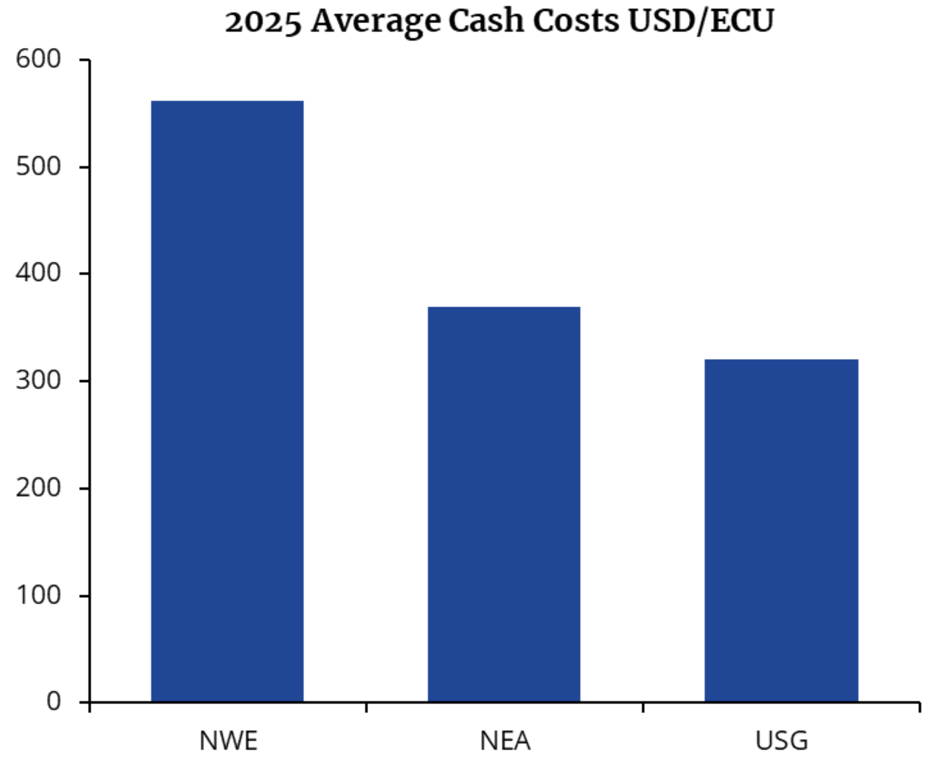
COMPANY	LOCATION	CAPACITY ‘000 KTY	TIMING	MAIN DERIVATIVE
Arkema	Jarrie, France	75	2024	Chloromethanes; Inorganics
BASF	Ludwigshafen, Germany	105	Late 2027	MDI; PO; EDC
Dow	Schkopau, Germany	253	Late 2027	EDC
Inovyn	Rheinberg, Germany	220	Likely 2026	ECH; HCl
LFS	Luelsdorf, Germany	77*	Late 2027	Cyanuric chloride (*mercury cells expected to convert to membrane)
Vencorex	Pont de Claix, France	119	2024	TDI; HCl
Total		**849**		

Source: Argus Media – Consulting Services

Growing cost disadvantage triggered crisis

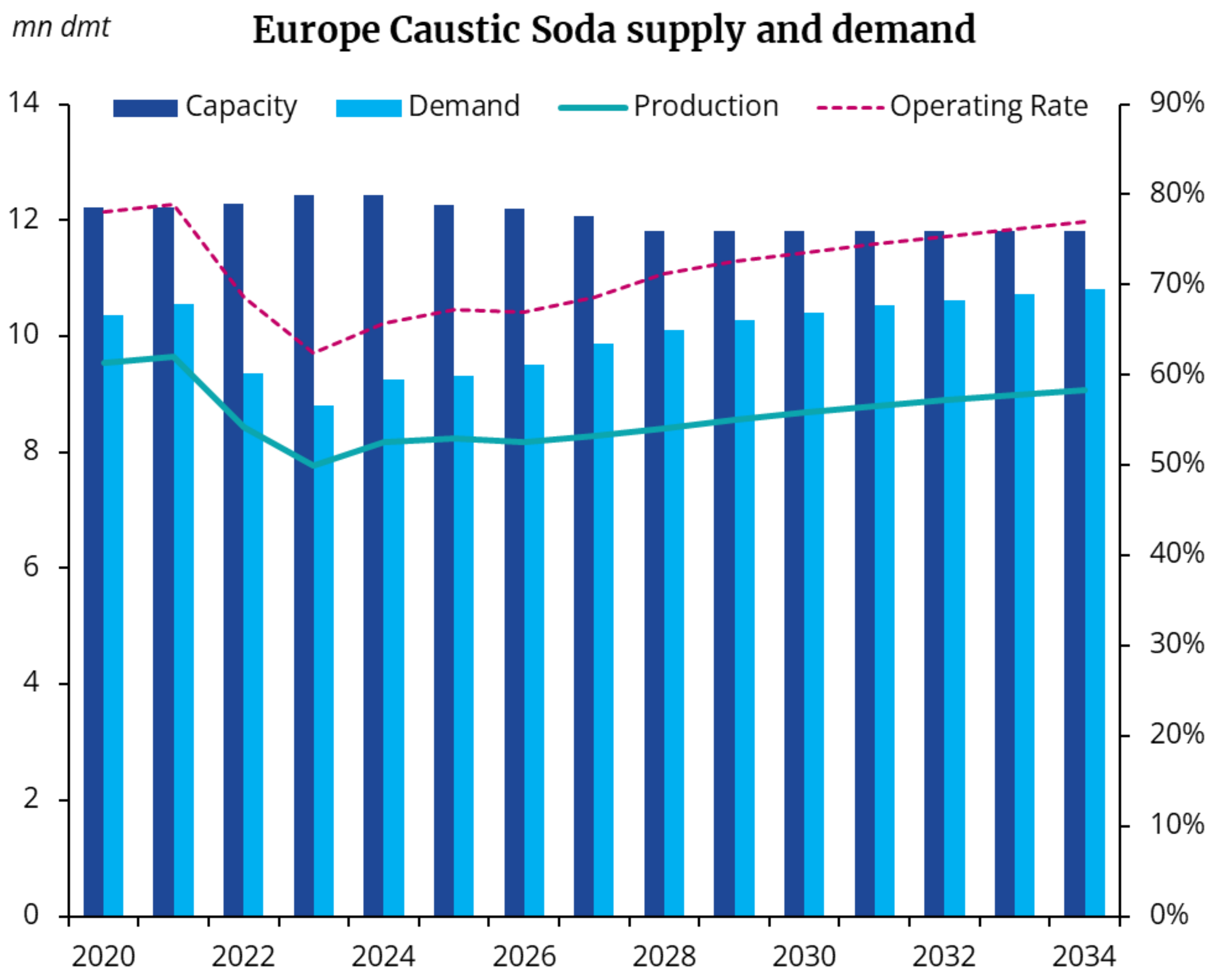
Much of Europe's crisis is home made and stems from a widened cost differential to its important counterparts. Europe struggles to come back from the recession and the result are permanent demand loss and capacity closures.

- 2025 NWE cash costs were 43pc higher than in the USG, its main trading partner. Europe's cash cost disadvantage has worsened since the energy crisis.
- Producing companies are required to invest in sustainability initiatives to reduce CO_2 emissions continuously. Many offer a 'green' version of their products, the cost of which is difficult to pass on to the end user.
- The EU and individual governments are slow to agree on and implement incentives that could ease cost pressures, revive demand and retain capacity.
- Energy costs in the EU are significantly higher than in other regions, as much of the natural gas consumed is imported LNG.



Source: Argus Media – Consulting Services

Closures support return to higher operating rates



- Slow demand recovery, permanently lost demand, and upcoming capacity closures will bring up the average operating rates to the high 70’s pc.
- Overseas producers/traders looking to enter Europe by using new storage space in coastal markets, but throughput capacities are small.
- Only a larger and prolonged capacity consolidation period could lead to structural shortage and consistently higher overseas imports.
- Europe is considering Anti-Dumping Duties on caustic soda to protect the domestic market.

Source: Argus Media – Consulting Services

Americas – rationalization

Major caustic soda demand loss

Company	State	Coast	Year	Demand	Pulp Capacity
Closed or Idled Pulp Mills					
George Pacific	FL	East	2023	21,000	480,000
Sonoco	NC	East	2023	17,000	460,000
Westrock	SC	East	2023	27,000	780,000
Packaging Corporation of America	WA	West	2023	9,000	290,000
Westrock	WA	West	2023	11,000	420,000
Nine Dragons	ME	East	2023	7,000	270,000
International Paper	Multiple	West	2023	18,000	500,000
International Paper	SC	East	2024	15,000	300,000
Pixelle Specialty	OH	Midwest	2025	12,250	314,566
Georgia Pacific	GA	East	2025	32,500	888,650
International Paper	GA	East	2025	20,000	849,329
Total				**189,750**	**5,552,545**
Others					
Dow Chemical	TX	USGC	2025	660,000	Propylene Oxide
Philips 66	CA	West	2025	5,000	Refinery
Valero	CA	West	2026	7,000	Refinery
Total				**672,000**	

- Loss of propylene oxide production on the USGC, leading to a loss of caustic soda demand.
- US West Coast caustic soda demand loss led by the pulp sector, as well as oil refining.
- US East Coast demand loss is being led by the pulp sector.
- US import tariffs are also leading to the East and West coasts procuring more caustic soda from the USGC.

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Source: Argus Media – Consulting Services

The US continues to optimize capacity

Company	Derivative	ECU Capacity	Chlorine Demand	Date
BASF (Ph 2)	MDI	existing	170kmt/yr	2021
Formosa	EDC	existing	80kmty/ry	2022
Westlake	EDC	120kmt/yr	existing	2022
Shintech (Ph1)	EDC	250kmt/yr	250kmt/yr	2022
Shintech (Ph2)	EDC	250kmt/yr	250kmt/yr	2024
Shintech (Ph3)	EDC	200kmt/yr	200kmt/yr	2024
Dow Chemcial	PO	Olin Supply	(600kmt/yr)	2025
Olin	PO	(450kmt/yr)	Dow Chemical	2025
Westlake (mercury closure)	Merchant	(100kmt/yr)	existing	2025
Westlake	EDC	(375kmt/yr)	(375kmt/yr)	2025
MP Materials	Rare Earth	150kmt/yr	existing	2026
Occidental Chemical (membrane)	EDC	920kmt/yr	existing	2026
Occidental Chemical (diaphragm)	EDC	(540kmt/yr)	existing	2026
PCC USGC	TiO2	340kmt/yr	existing	2028
Century Lighium (proposed)	Lithium	750kmt/yr	750kmt/yr	2030
Shintech SP4 (proposed)	EDC	700kmt/yr	700kmt/yr	2030
Total		1,975kmt/yr	1,255kmt/yr	

- Minamata Convention directive forced mercury cell capacity closure at Natrium, WV.
- Uneconomic Propylene Oxide closes at Freeport, TX.
- US forecast to add 540,000 ECU of capacity, more than demand increases.
- New chlorine demand from vinyls, isocyanates, lithium, and rare earths.
- Speculative capacity additions at Shintech and Century Lithium.
- Some smaller regional chlor-alkali plants are not included in the table.

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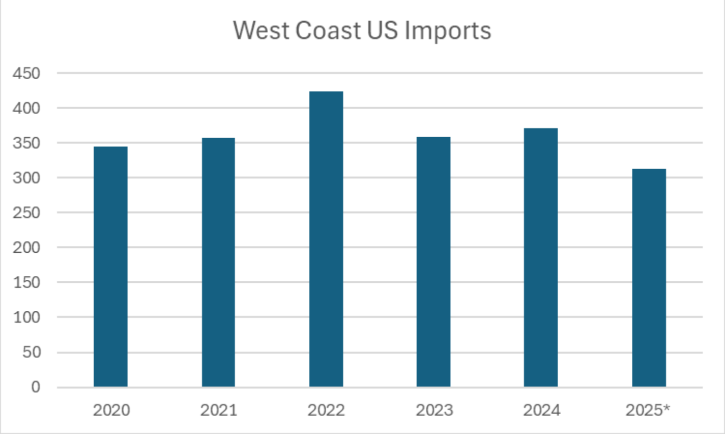
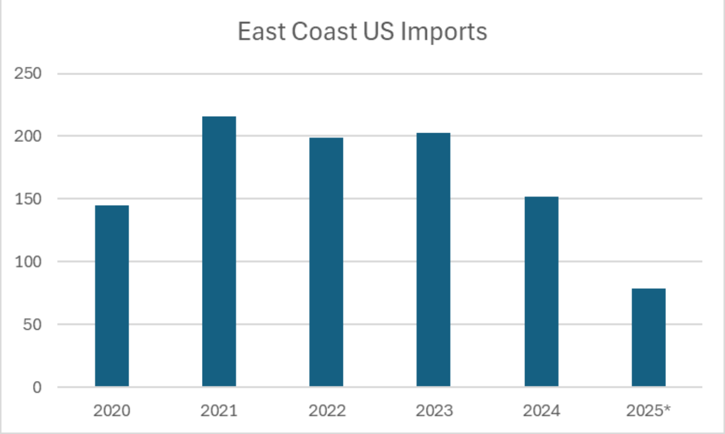
Source: Argus Media – Consulting Services

US and Canada Import Extracts

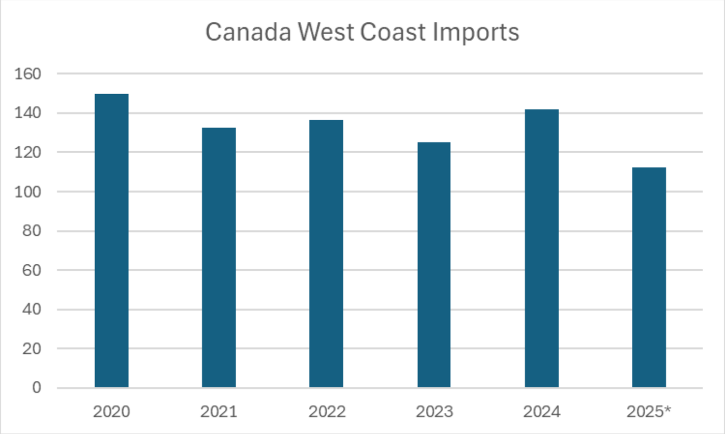
US West Coast imports declined in 2025 and are expected to decline further in 2026, owing to weaker demand and a shift to USGC supply



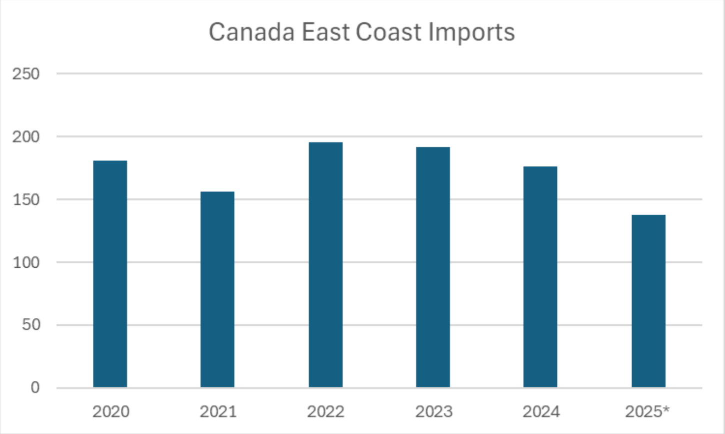
US East Coast imports declined in 2025 and are expected to decline further in 2026, owing to limited European supply and a shift to USGC supply



Canada's West Coast imports declined in 2025 and expected to decline further in 2026 owing to weaker demand



Canada's East Coast imports declined in 2025 but are expected to grow in 2026 with stronger demand



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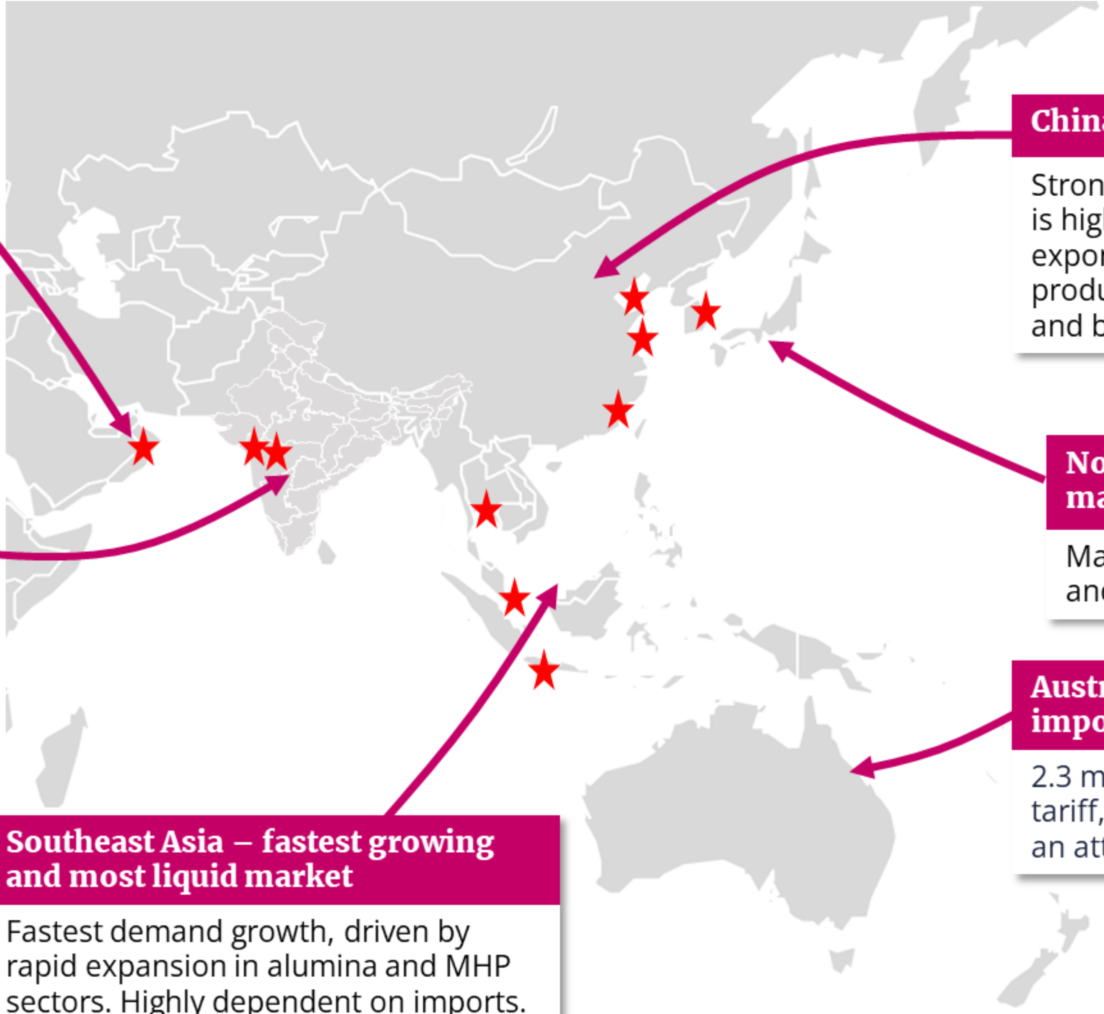
Asia: adapts and grows

Asia chlor-alkali market – Macro Snapshot



Middle East will turn major exporter after 2028

Growing domestic demand and energy advantage. Middle East will turn a major exporting region when Ta'ziz site is fully commissioned.

India – world's 3rd largest CA market

Lack of strong caustic demand base and weak chlorine downstream integration has constrained chlor-alkali industry.

China – world's largest CA market.

Strong demand base and chlorine downstream is highly integrated. Not highly dependent on exports (Only 3-4pc of total output). This enable producers to sustain a more balance operation and better operating netback.

Northeast Asia, outside China – mature market

Mature market with very weak demand growth and highly export dependent.

Australia, world's largest caustic importing country

2.3 mn dmt/yr market and growing, zero tariff, steady demand, and has become an attractive target market for exporters.

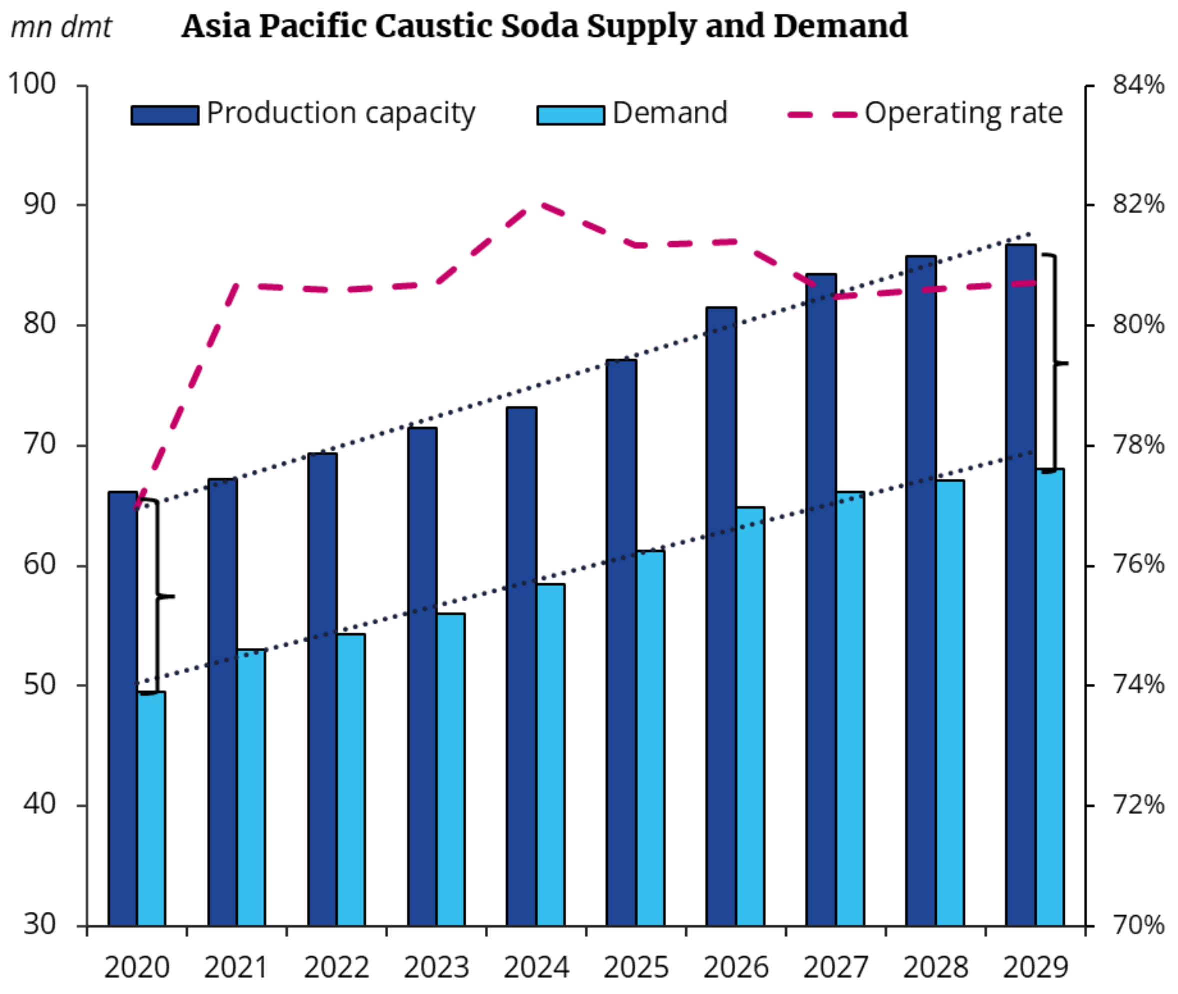
Southeast Asia – fastest growing and most liquid market

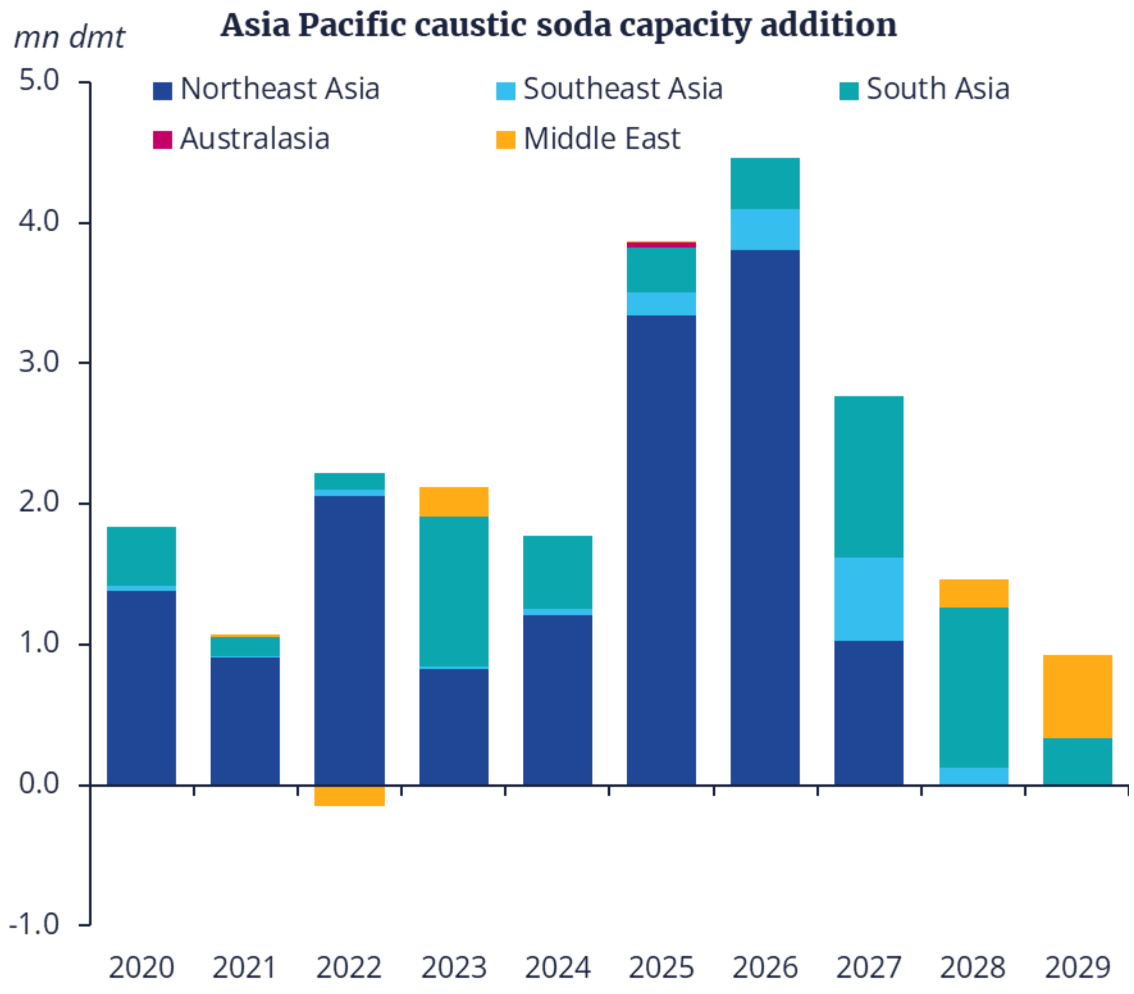
Fastest demand growth, driven by rapid expansion in alumina and MHP sectors. Highly dependent on imports.

★ Greenfield/Expansion

Source: Argus Media – Consulting Services

Asia Chlor-Alkali fundamentals





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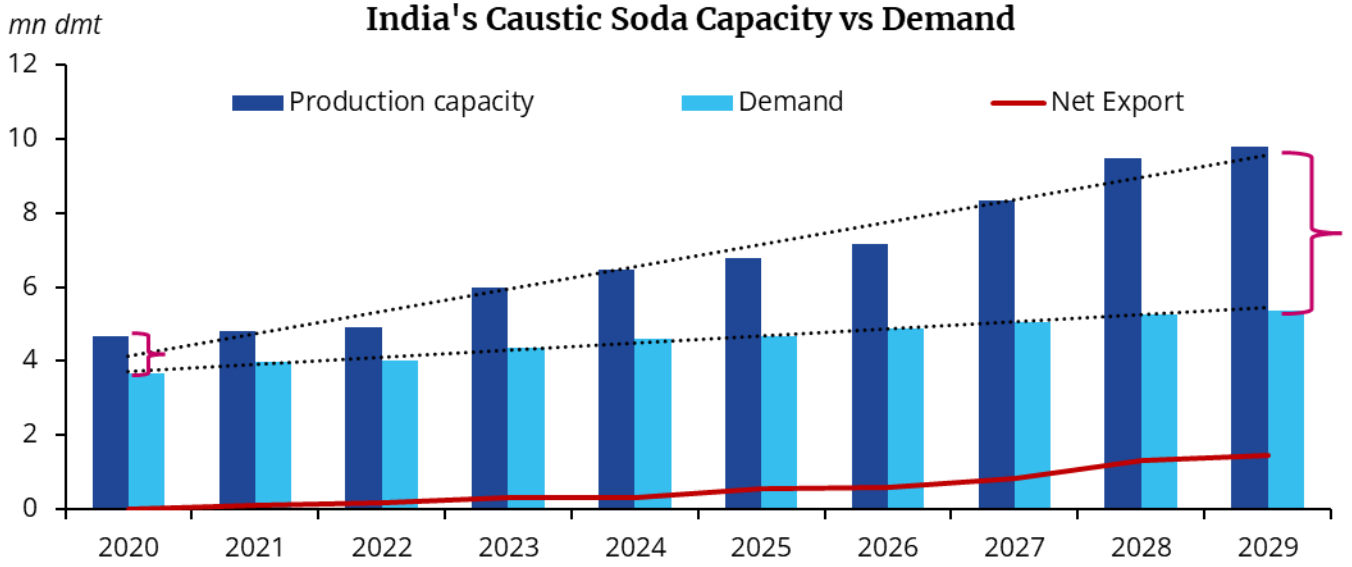
India Chlor-alkali – challenges and options

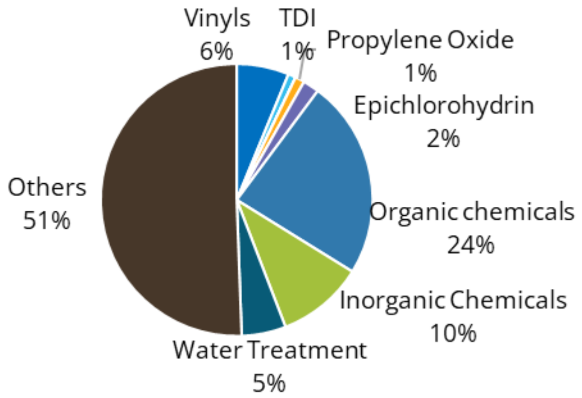
Challenges
- Capacity growth exceeds demand growth (2026-2030)
- Low chlorine downstream integration
- Lack of strong caustic demand base (e.g. alumina, battery materials, rayon)
- Energy structure
- Infrastructure

Option:
- National policy
- Intermediate industry
- Emerges as a strong net-exporter
- Energy policy
- Free trade agreement with EU

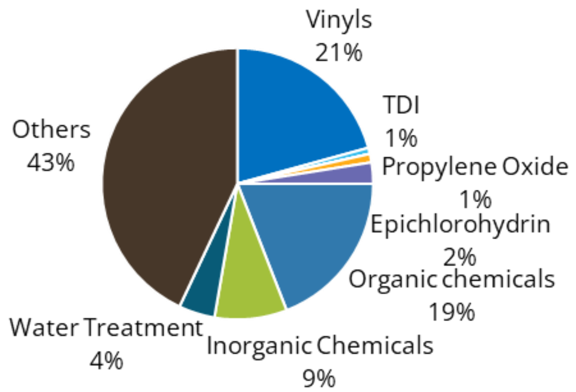
India's Caustic Soda Capacity vs Demand



Chlorine demand by derivative, 2025



Chlorine demand by derivative, 2029



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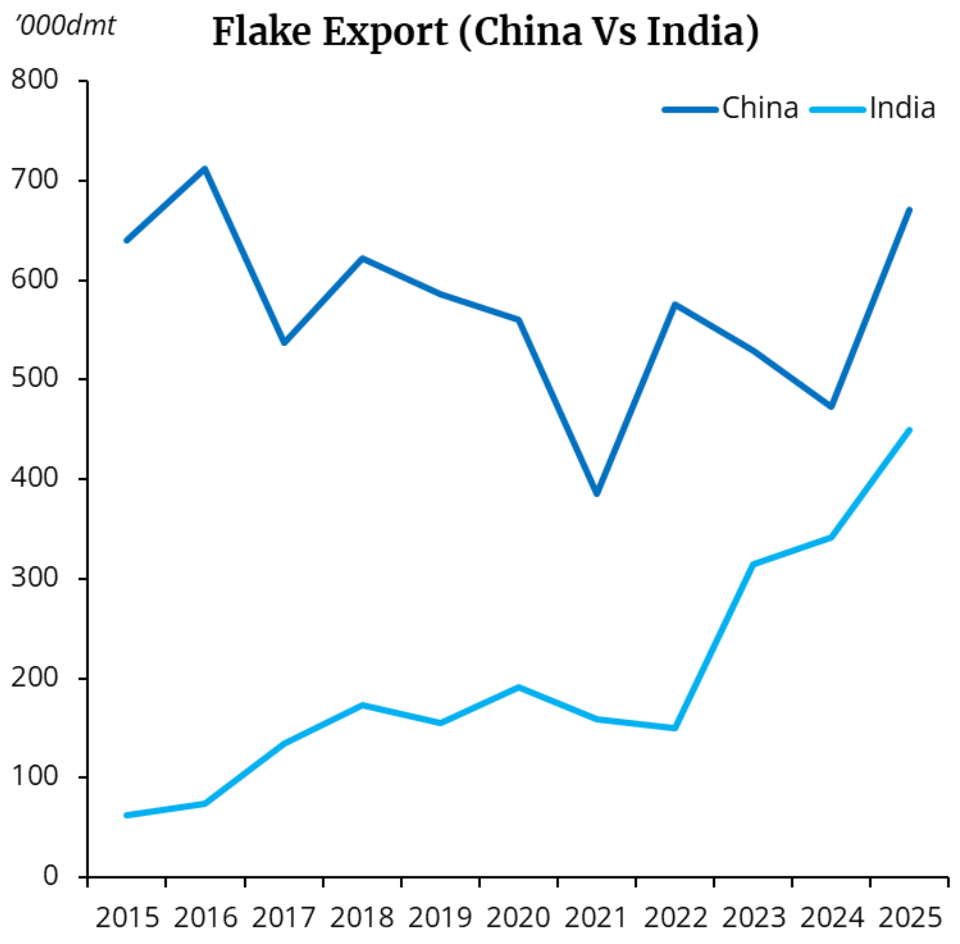
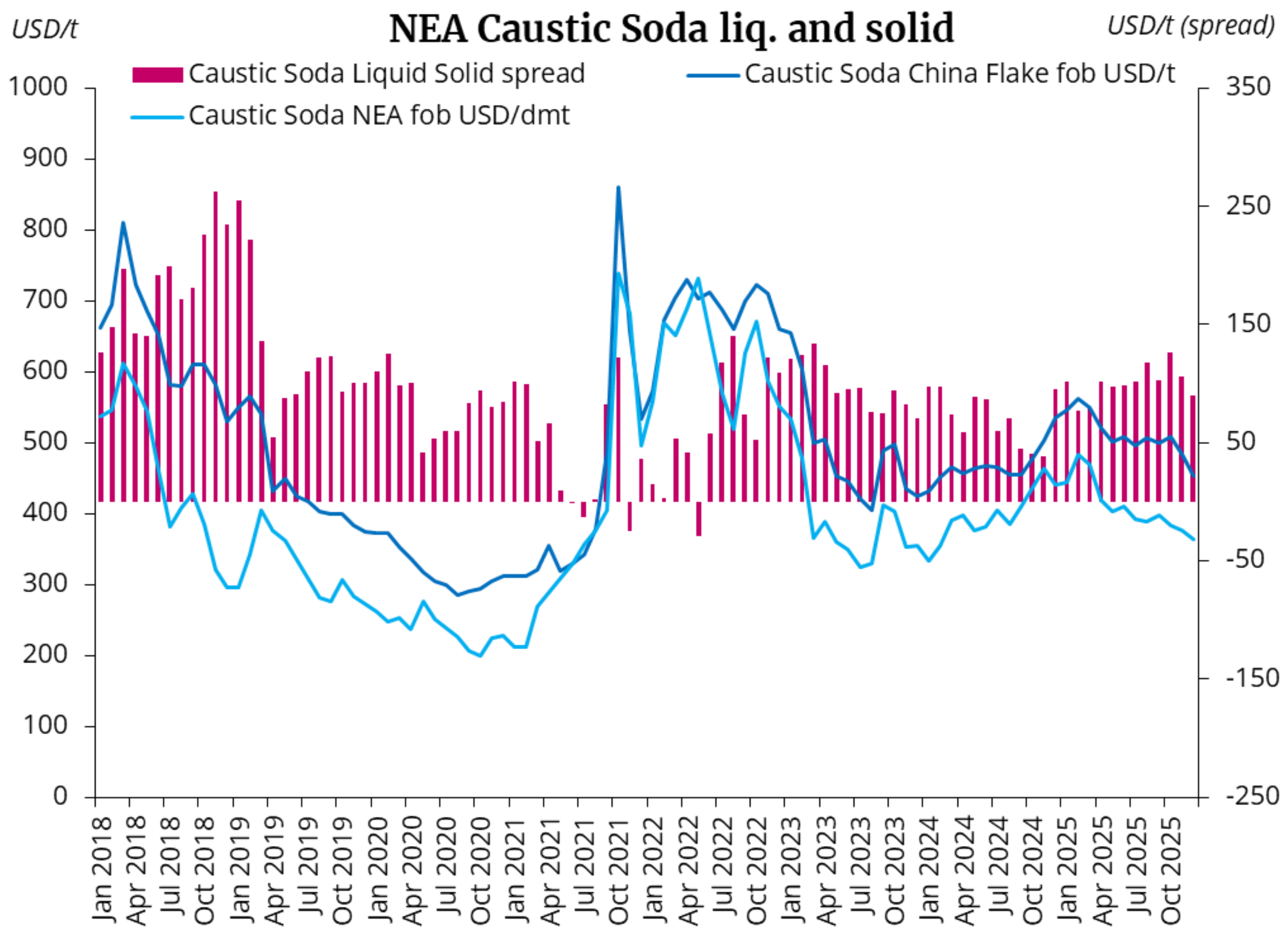
Caustic flake – where it stands now?





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Chlor-vinyl chain development

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PVC – stuck in the middle of caustic soda and polyethylene
Difficult balancing mechanism

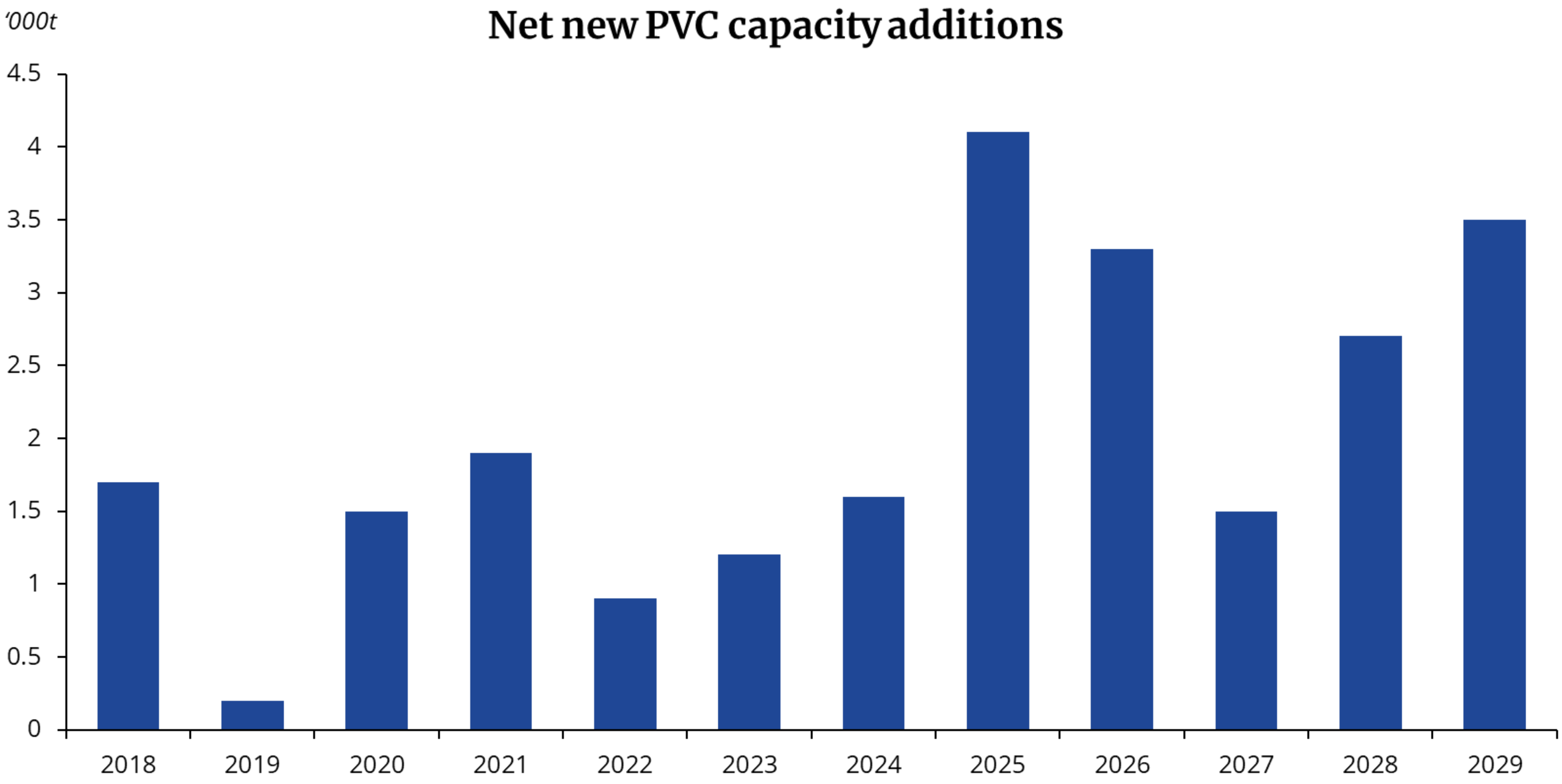
Polyethylene
- Essentially 100pc ethylene
- Globally traded commodity
- Reactive to GDP fluctuation
- On-purpose production – no co-products to balance

PVC
- 57pc inorganic chlorine, 43pc ethylene
- Globally traded commodity
- Demand correlated to construction
- More sensitive to GDP fluctuation

Caustic soda
- Globally traded commodity
- Demand correlated to manufacturing
- Less sensitive to GDP fluctuation

PVC and caustic soda are co-products, but polyethylene dynamics impact balance

How has the PVC industry responded?



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Select PVC capacity changes

Company	Country	Grade	Capacity '000t/yr	Timeline	Notes
Westlake	US	Specialties	TBC	2026	Molecular-oriented PVC. 4 new lines.
Mexichem (Orbia)	Colombia	Various	+ 100	2025	Will import VCM.
Braskem	Brazil	Suspension	+ 45	2026	Debottlenecking from Nov 2024, 18-month timeline.
Vynova	Netherlands	Suspension	- 225	2025	Closing PVC plant, Approximately one third of total PVC production
TA'ZIZ	UAE	Suspension	+ 800	Q4 2028	Planned startup with EDC and VCM exports
AGC Vinythai	Thailand	Suspension	+ 400	Q2 2025	Delayed from Mar 2025.
Qatar Energy	Qatar	Suspension	+ 350	Q3 2025	Delayed from mid 2025.
Reliance	India	Various	+ 1,200	2026-2027	1.2mn t/yr of s-PVC, 0.3mn t/yr of c-PVC.
ADANI Group (phase 1)	India	Various	+ 800	2026-2027	Still identifying grade split. Likely delayed from 2026.
Wanhua	China	Suspension	+ 400	Q2 2025	Ethylene-based. Delayed from Mar 2025.
Zhejiang Satellite	China	Suspension	+ 800	Unclear	Ethylene-based.
Qingdao Haiwan	China	Suspension	+ 200	2Q 2025	Ethylene-based.
Zhejiang Jiahua	China	Suspension	+ 300	2025	Ethylene-based.
Tianjin Bohai Chemical	China	Suspension	+ 400	2H 2025	Ethylene-based. Delayed from Q2 2025.
Jiantao Beihai New Material	China	Suspension	+ 400	2026	Ethylene-based.

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EDC today and how it may adapt.

2025 ('000t) Import→ Export↓	Africa	Australasia	Central and Eastern Europe	Latin America and Caribbean	Middle East	Nordic Europe	North America	Northeast Asia	Northwest Europe	Russia and Central Asia	South Asia	Southeast Asia	Southern Europe	Total
Africa														**0**
Australasia														**0**
Central and Eastern Europe			5											**5**
Latin America and Caribbean														**0**
Middle East	55				3						278	5		**342**
Nordic						5							46	**51**
North America	51			223	77			182	48		112	140		**833**
Northeast Asia	0							430			5	110		**544**
Northwest Europe	205		2			12			262		84	11	12	**587**
Russia and Central Asia														**0**
South Asia	5													**5**
Southeast Asia	109							7			31	143		**291**
Southern Europe														**0**
Total	**426**	**0**	**7**	**223**	**80**	**17**	**0**	**619**	**310**	**0**	**509**	**409**	**58**	

Exports	0	0	0	0	339	46	833	115	325	0	5	147	0
Imports	426	0	2	223	77	12	0	189	48	0	509	265	58
Net Exports	(426)	0	(2)	(223)	262	34	833	(75)	277	0	(504)	(118)	(58)

- European exports to Africa to decline with Dow closing EDC capacity
- Middle East exports to Africa to increase with new TA'ZIZ EDC expansion
- USGC exports to Latin America to increase as Braskem idles EDC capacity

Note: Trade numbers till Oct 2025, except Latin America and Caribbean

Source: Argus Media – Consulting Services

VCM today and how it may adapt.

2025 ('000t) Import→ Export↓	Africa	Australasia	Central and Eastern Europe	Latin America and Caribbean	Middle East	Nordic Europe	North America	Northeast Asia	Northwest Europe	South Asia	Southeast Asia	Southern Europe	Total
Africa													**0**
Australasia													**0**
Central and Eastern Europe													**0**
Latin America and Caribbean													**0**
Middle East										172			**172**
Nordic Europe													**0**
North America				383			597	1					**981**
Northeast Asia								757		186	508		**1451**
Northwest Europe					55				417			178	**649**
South Asia													**0**
Southeast Asia										12	122		**134**
Southern Europe				0									**0**
Total	**0**	**0**	**0**	**383**	**55**	**0**	**597**	**758**	**417**	**370**	**631**	**178**	

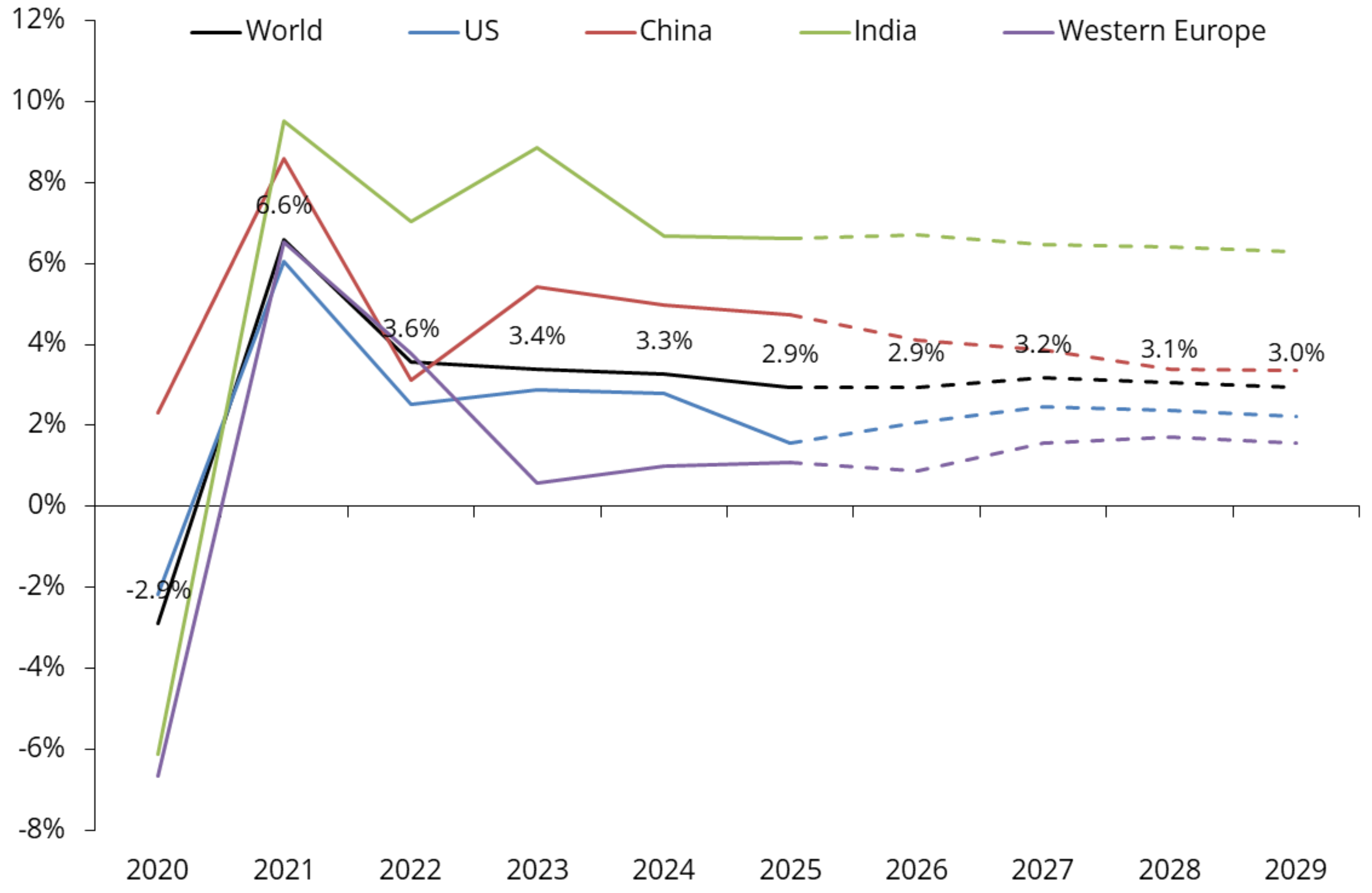
Exports					172	0	384	694	232	0	134	0
Imports				383	55	0	0	1	0	370	631	178
Net Exports				(383)	117	0	384	693	232	(370)	(497)	(178)

- European imports of VCM are likely to increase with Shintech SP4's proposed expansion
- Northwest Europe exports of VCM to Southern Europe will be displaced by the Shintech SP4 proposed expansion
- USGC exports to Latin America to increase with PVC capacity expansion
- Northeast Asia's exports of VCM to Southeast Asia are likely to decrease

Note: Trade numbers till Oct 2025

Source: Argus Media – Consulting Services

GDP growth drives PVC demand



— *Argus Media Consulting Services, Oxford Economics*

- India is anticipated to lead global economic growth and an increase in PVC demand.
- China's PVC demand will increase with GDP despite population declines.
- Europe and the US economies are forecast to grow, although at slow rates.

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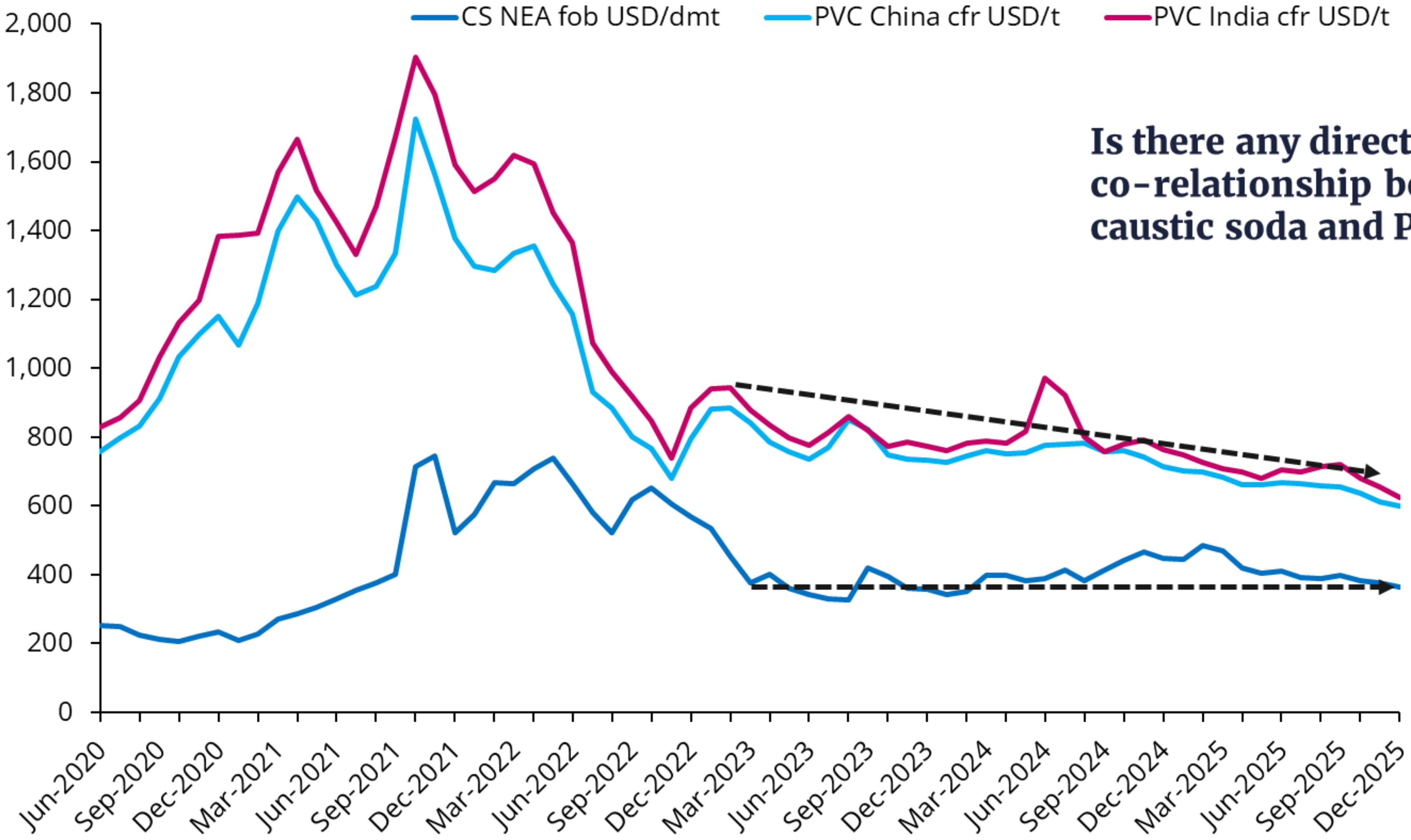
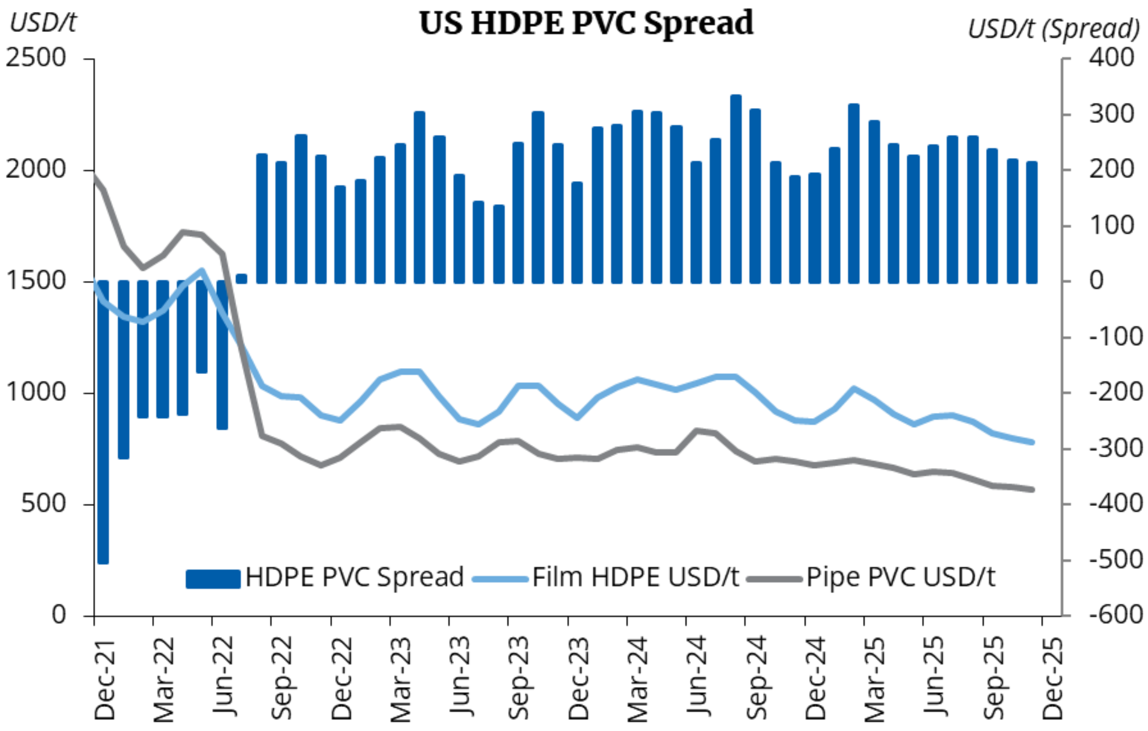
Caustic soda versus PVC prices

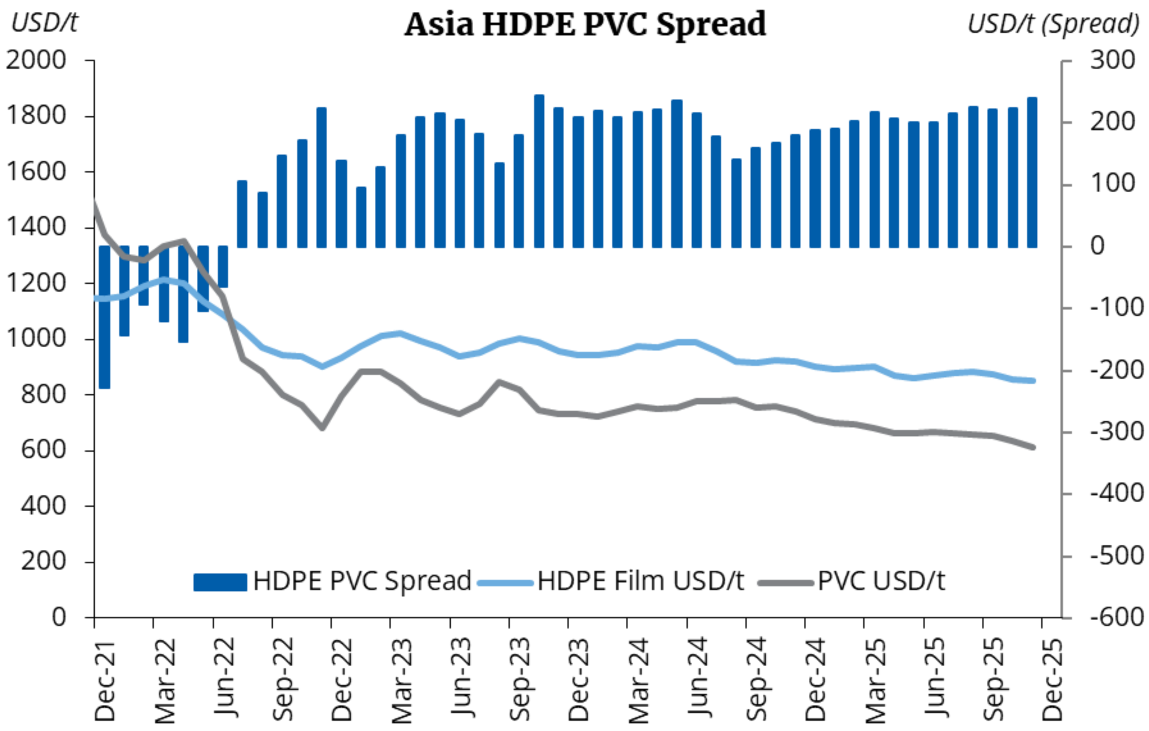


Is there any direct or indirect co-relationship between caustic soda and PVC prices?

Source: Argus Media – Consulting Services

HDPE PVC spread





- Record demand for PVC in 2021 and 2022 pushed PVC prices to a premium over HDPE.
- Since mid-2022, caustic soda demand has outpaced PVC demand, leading to a more traditional spread between PVC and HDPE.
- The year-end 2025 spread suggests that USGC caustic soda demand was weaker than Asia caustic soda demand – the USGC had excess inventories at the start of 4Q25 due to the lack of hurricanes and was attempting to destock.

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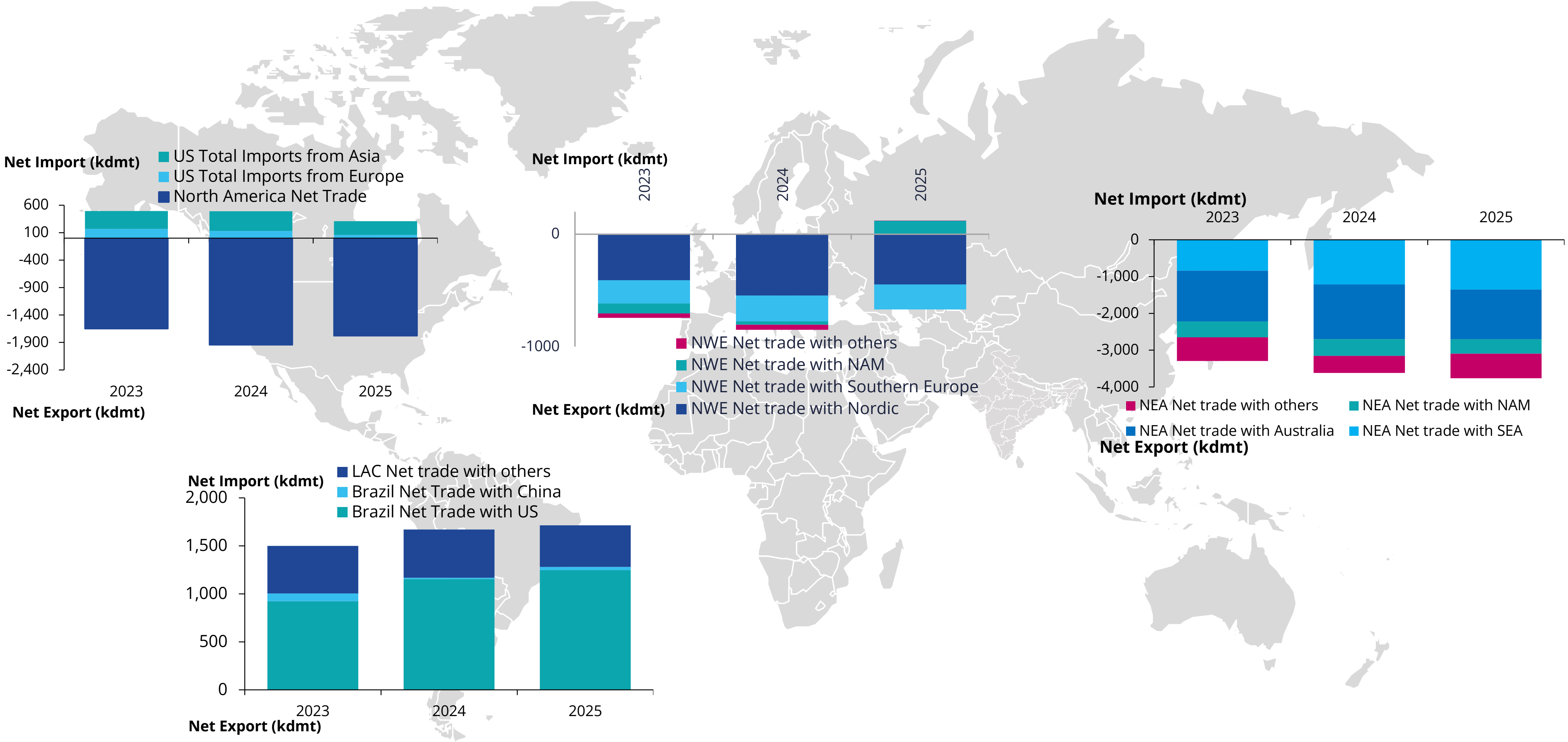
Source: Argus Media – Consulting Services

Trade flow

Global Caustic Soda Trade



Source: Argus Media – Consulting Services

Balances: Market Context – 2025 Trade Flows impacted by US tariff

Canada caustic imports from northeast Asia, W Europe and USGC (0pc tariff)

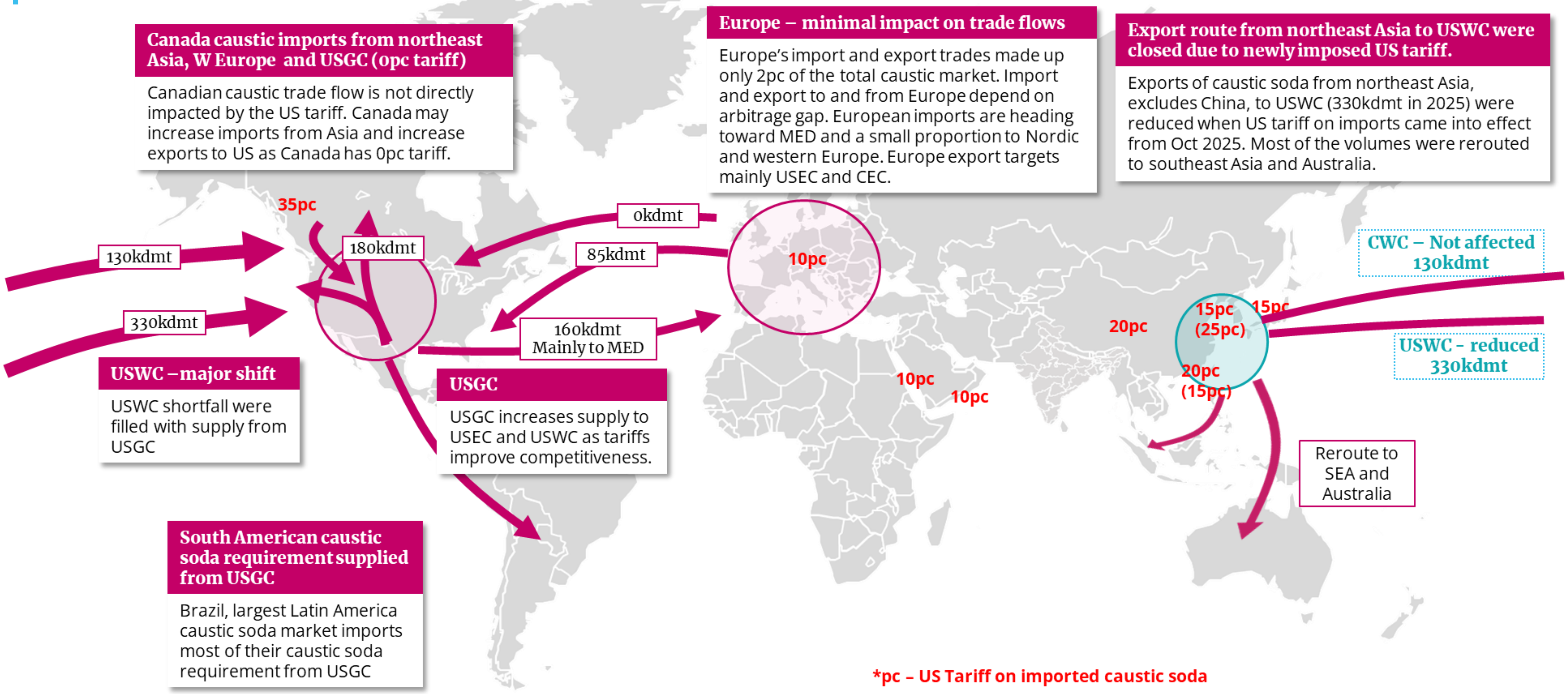
Canadian caustic trade flow is not directly impacted by the US tariff. Canada may increase imports from Asia and increase exports to US as Canada has 0pc tariff.

Europe – minimal impact on trade flows

Europe's import and export trades made up only 2pc of the total caustic market. Import and export to and from Europe depend on arbitrage gap. European imports are heading toward MED and a small proportion to Nordic and western Europe. Europe export targets mainly USEC and CEC.

Export route from northeast Asia to USWC were closed due to newly imposed US tariff.

Exports of caustic soda from northeast Asia, excludes China, to USWC (330kdmt in 2025) were reduced when US tariff on imports came into effect from Oct 2025. Most of the volumes were rerouted to southeast Asia and Australia.



USWC – major shift

USWC shortfall were filled with supply from USGC

USGC

USGC increases supply to USEC and USWC as tariffs improve competitiveness.

South American caustic soda requirement supplied from USGC

Brazil, largest Latin America caustic soda market imports most of their caustic soda requirement from USGC

*pc – US Tariff on imported caustic soda

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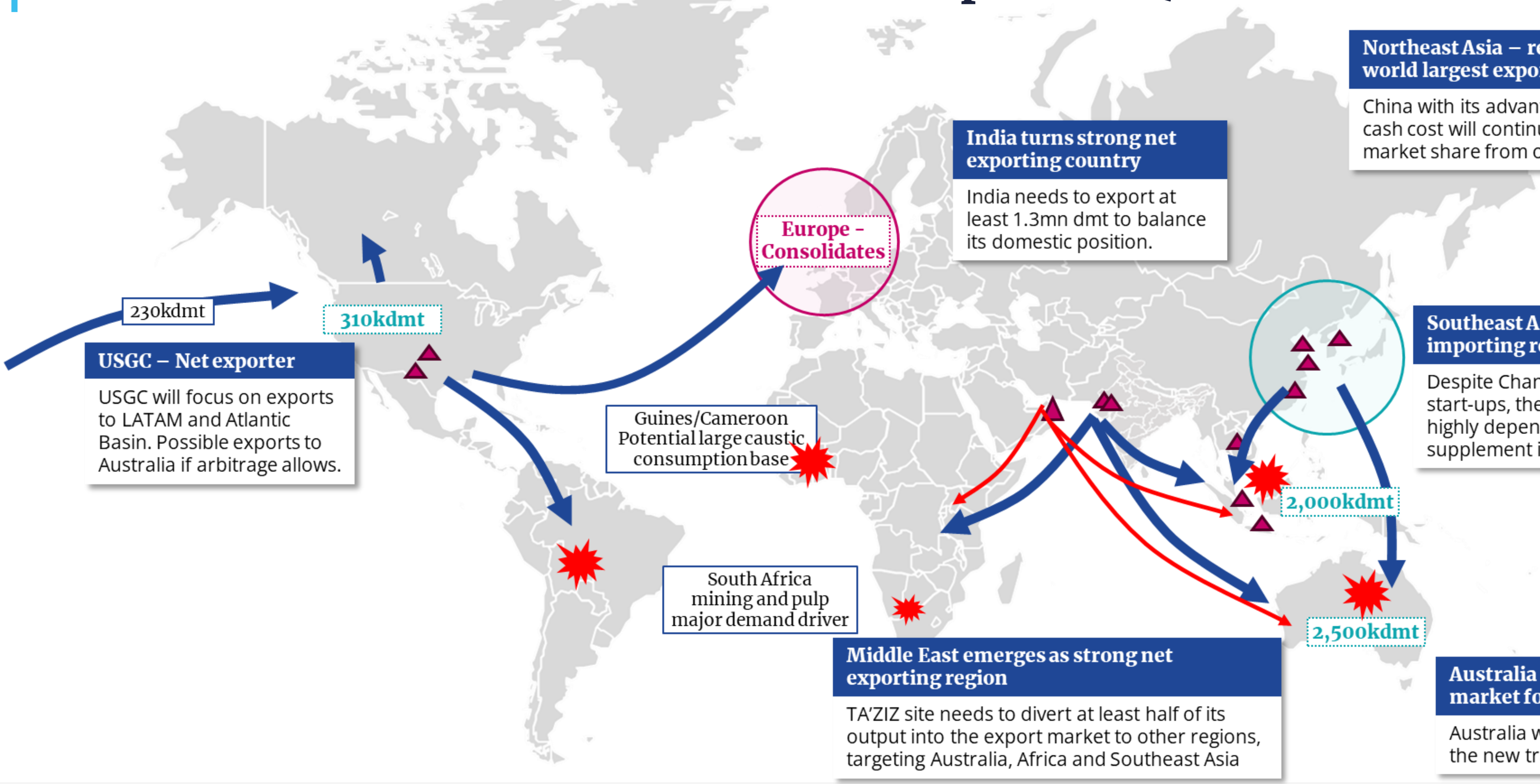
Source: Argus Media – Consulting Services

Balances: Market Context – Trade Flows post 2027



USGC – Net exporter

USGC will focus on exports to LATAM and Atlantic Basin. Possible exports to Australia if arbitrage allows.

India turns strong net exporting country

India needs to export at least 1.3mn dmt to balance its domestic position.

Northeast Asia – remains as world largest export region

China with its advantaged ECU cash cost will continue to take market share from others.

Southeast Asia – robust importing region

Despite Chandra and Nanshan start-ups, the region is still highly dependent on imports to supplement its consumption.

Middle East emerges as strong net exporting region

TA'ZIZ site needs to divert at least half of its output into the export market to other regions, targeting Australia, Africa and Southeast Asia

Australia – main targeted market for exports

Australia will benefit from the new trade flow post 2027

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Source: Argus Media – Consulting Services

Concluding thought

Key takeaways

- Long market 2026-2030.
- The cash cost curve will continue to flatten with the marginal producer falling lower on the curve.
- Despite Asia's capacity growth far exceeding demand growth, Asia will adapt and grow.
- New capacities and protectionist tariffs altered trade flow in Asia and the Americas.
- The chlor-vinyls industry will be forced to optimize to the new reality over time.
- Caustic soda will remain an important molecule in the value chain.

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Further information

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