

Walking Through the PVC Trough: - Where is the Light at the End of the Tunnel

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Oversupply situation?

Integration level?

Demand support?

Agenda

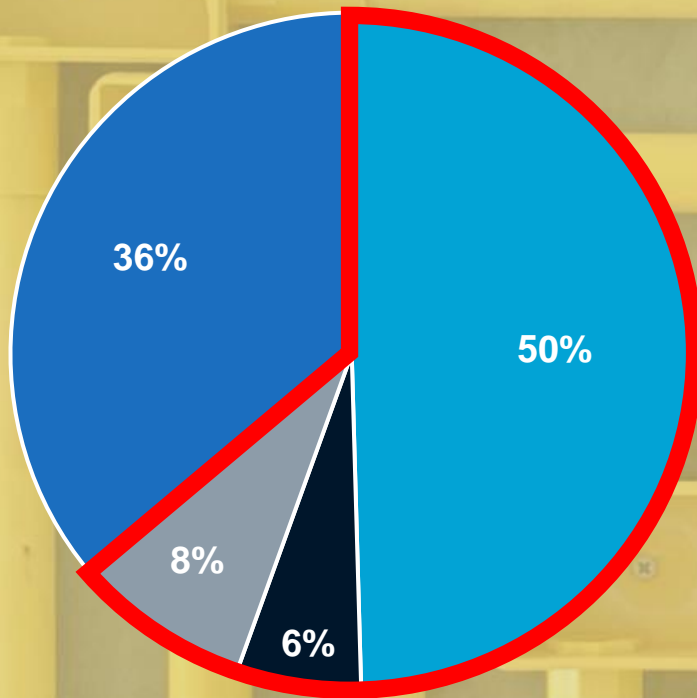
Market update and Market drivers

Challenges and Opportunities

Recovery Path

Asia is largest PVC market but with supply/demand imbalance

2023 PVC demand by region

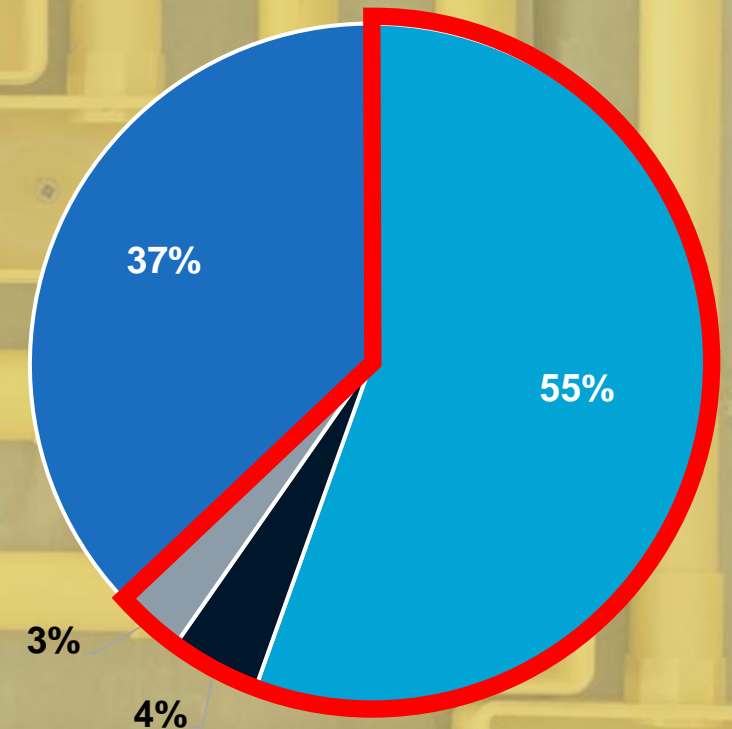


Asia (NEA+SEA+ISC) = 64% global PVC demand

SEA and ISC have large PVC deficit, 14% of world demand with only 7% share of capacity



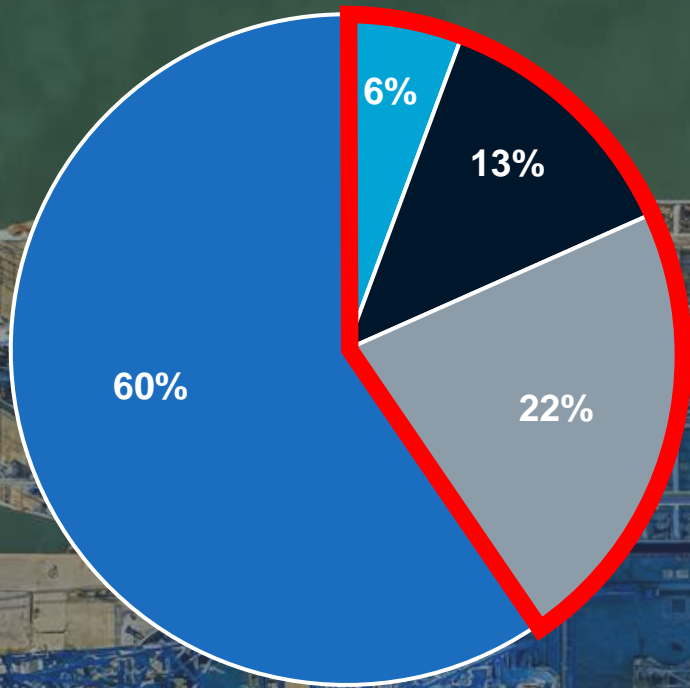
2023 PVC capacity by region



Also, vinyl integration level is insufficient for ISC and SEA, leading to imports to fill the gap...

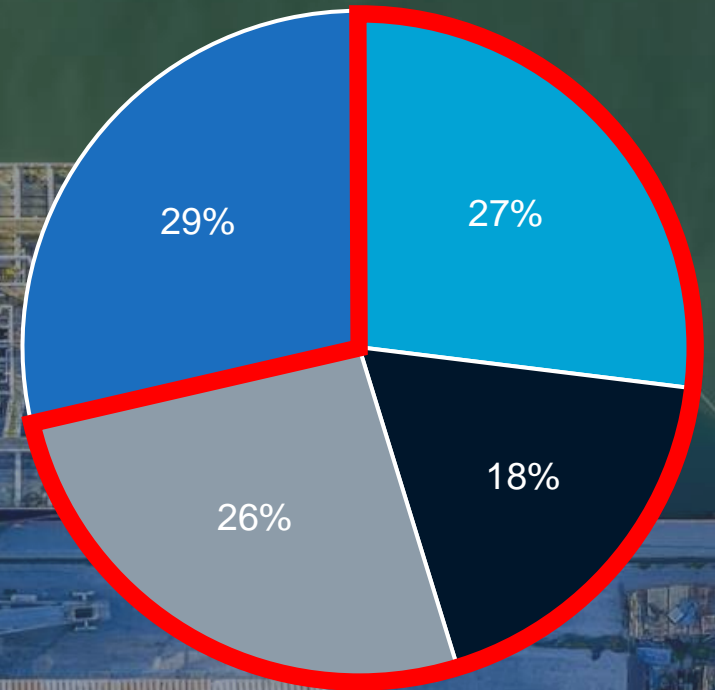
2023 PVC imports by region

2023 EDC imports by region



SEA and ISC: 35% of global PVC trade vs. 6% for NEA

Limited integration drives Asia EDC imports = 71% share of global imports



NEA SEA ISC Rest of the World

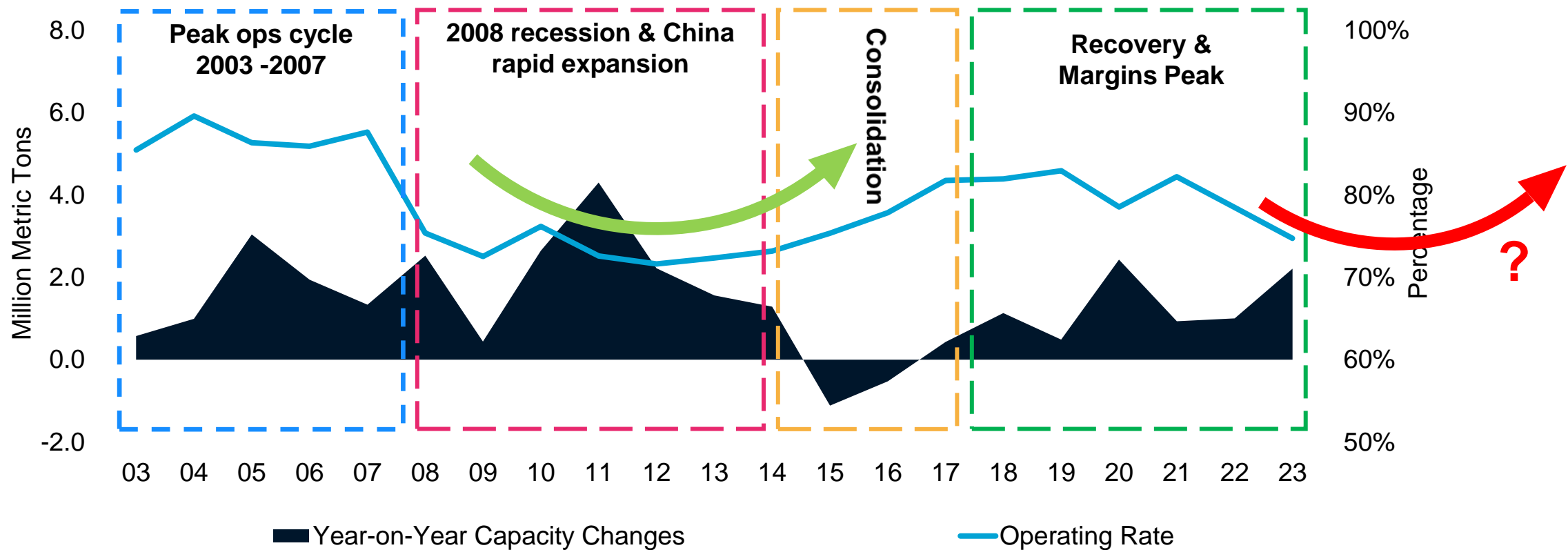
NEA SEA ISC Rest of the World

The background features a blue-tinted financial market display. On the left, a list of numerical values is shown in various colors: 93.21 (blue), 1.8245 (red), 1.390 (green), 0.9269 (red), and 65.84 (blue). On the right, a candlestick chart is visible with several green bars, indicating price movements. The overall aesthetic is that of a digital financial dashboard.

Market update and Market drivers

The PVC market is cyclical - What is the shape of recovery?

Global Year-on-Year Capacity Change Versus Operating Rate

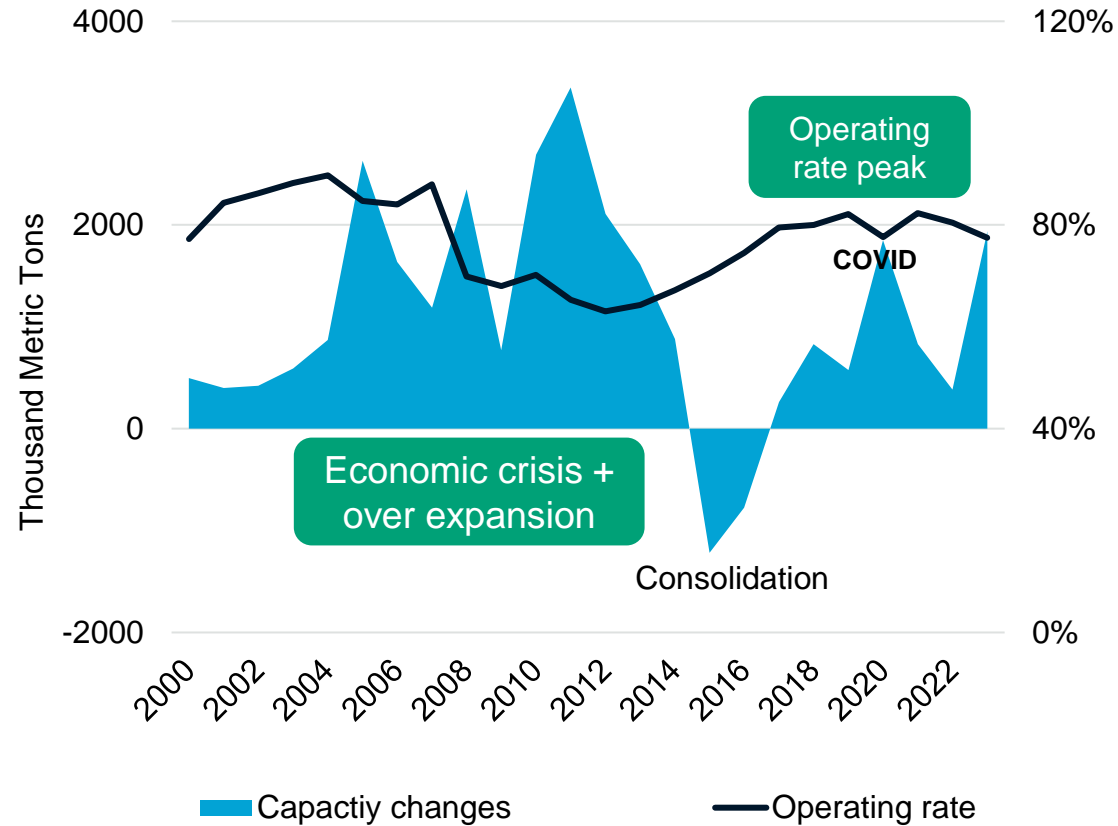


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NEA PVC margins peaked has passed...

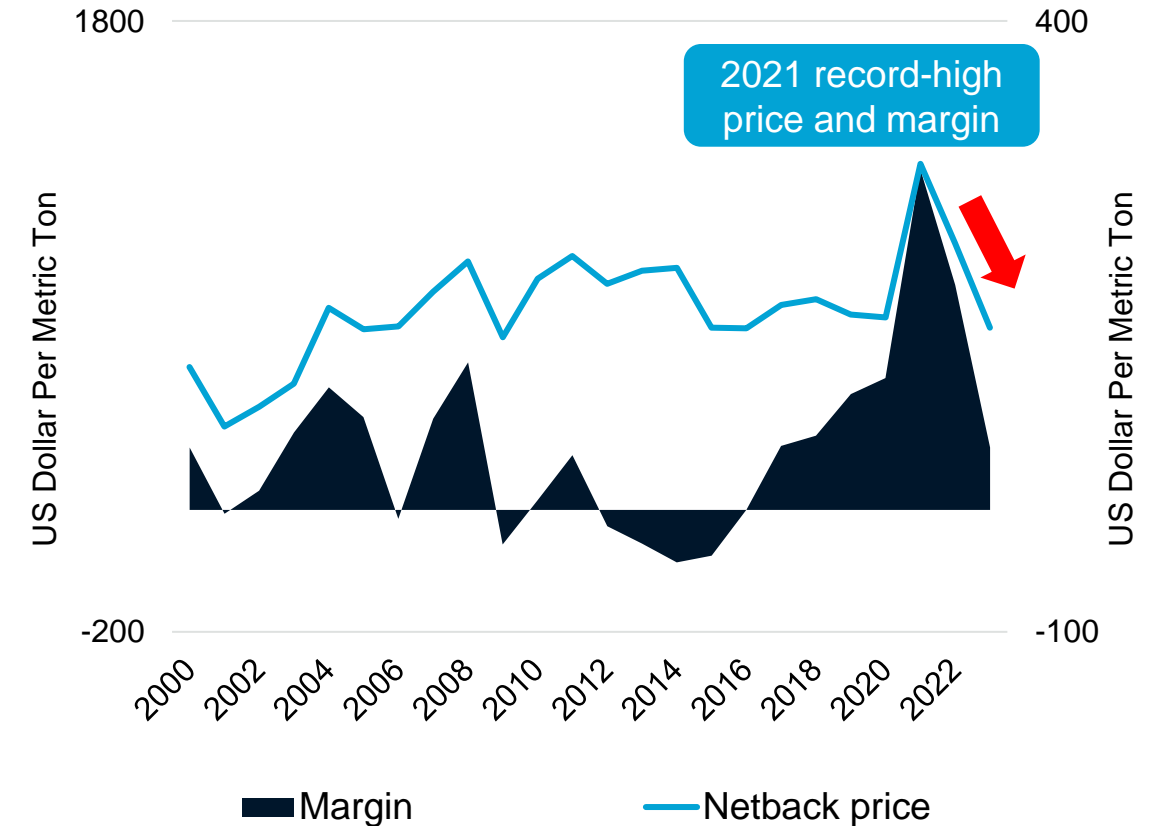
NEA PVC Capacity change vs Operating rate



Source: Chemical Market Analytics by OPIS

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NEA PVC Price and Margin



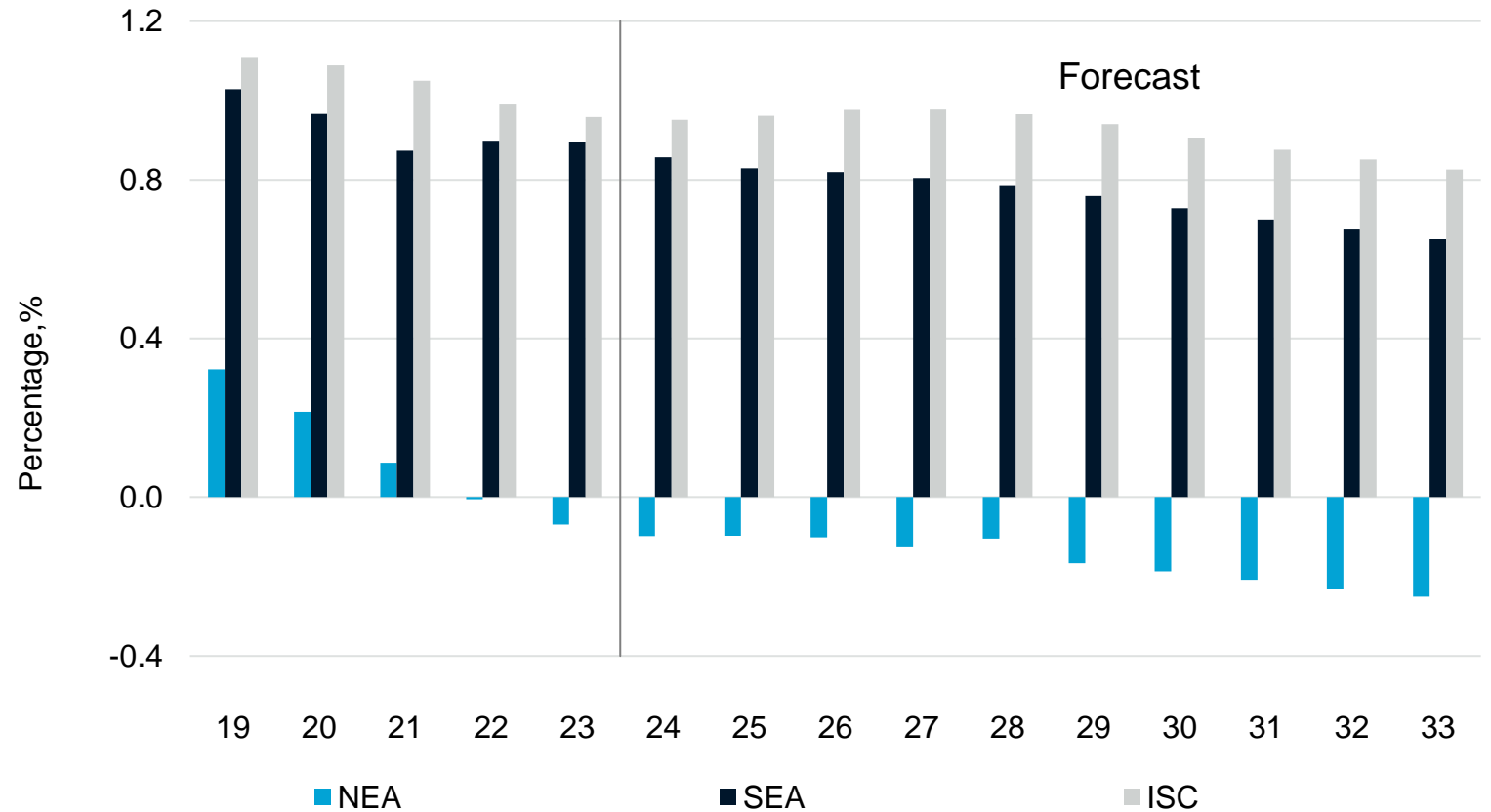
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Declining population coupled with a maturing market will fundamentally change the Northeast Asia growth pattern

- The population of mainland China is expected to shrink by 15 million over the next 10 years.
- NEA and China PVC growth elasticity relative to GDP forecast to drop by 50% over the next 5 years.
- Southeast Asia (SEA) and the Indian subcontinent (ISC) populations will continue to expand, greater needs for infrastructure and housing support PVC demand.
- Indian subcontinent has the largest demand growth potential.

Asia population growth (%) by regions

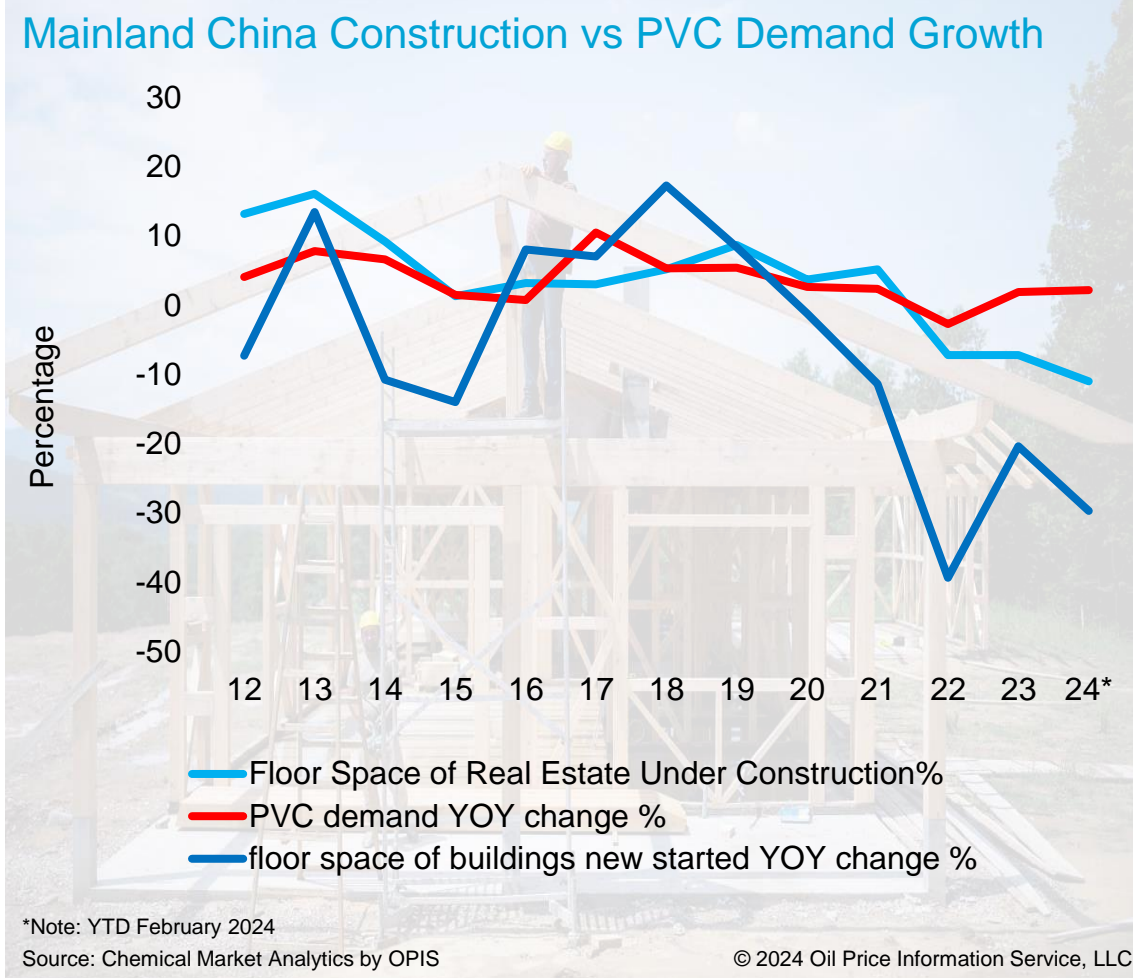


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Critical building and real estate sector under duress

- The decline in new floor space building plummeted 7% in 2023, on top of a 7.2% decline in 2022.
- New starts for floor space was worst, dropping 20% in 2023 with YTD Feb 2024 numbers not showing any signs of recovery
- Debt restructuring for real estate developers has helped from government's stimulus, but could this be a case of too little, too late?
- Not expecting a quick recovery in the real estate sector, projection range from 1 to 2 years at the min.
- In need of other sectors' demand to support growth



Mainland China PVC market has matured

Mainland China PVC Demand Growth vs GDP Growth

	Historical		Forecast
	2000-2009	2010-2019	2020-2033
PVC Demand, Annual Average (%)	11.5	6.6	~ 2.0
GDP Growth, Annual Average (%)	10.3	7.7	~ 4.0
Elasticity (PVC demand/GDP)	1.1	0.9	~ 0.5

- PVC demand has entered a mature phase. Next 10 years average demand growth elasticities with respect to GDP forecast fall below 1.0, closer to 0.5
- Socioeconomic and demographic changes over the next decade will decelerate the growth rate
- Excess supply may persist over the next 2 to 3 years, which will slow future supply-side expansion

Recent stimulus from government (17 May 2024)

1. Lower the minimum down payment ratio for the first and second home loans to 15% and 25% respectively. Cut the personal housing provident fund loan interest rate by 0.25 percentage points
2. Local governments rationally repurchase the inventory of commercial housing as government-subsidized housing. Fully support and ensure the financing and completion delivery of real estate projects under construction
3. Set up 300 billion yuan in government-subsidized housing re-loans.



SEA population is underserved with strong growth potential

Vietnam (#15*)

(7.5% PVC demand growth AAGR 2024-2028)

- Property investment growth
- High potential for further investment

Philippine (#12*)

(6% PVC demand growth AAGR 2024-2028)

- High demographic dividend
- Low PVC consumption per capita

Thailand (#22*)

(3.2% PVC demand growth AAGR 2024-2028)

- AGC (Vinythai) 400kta PVC expansion in 2025

Indonesia (#4*)

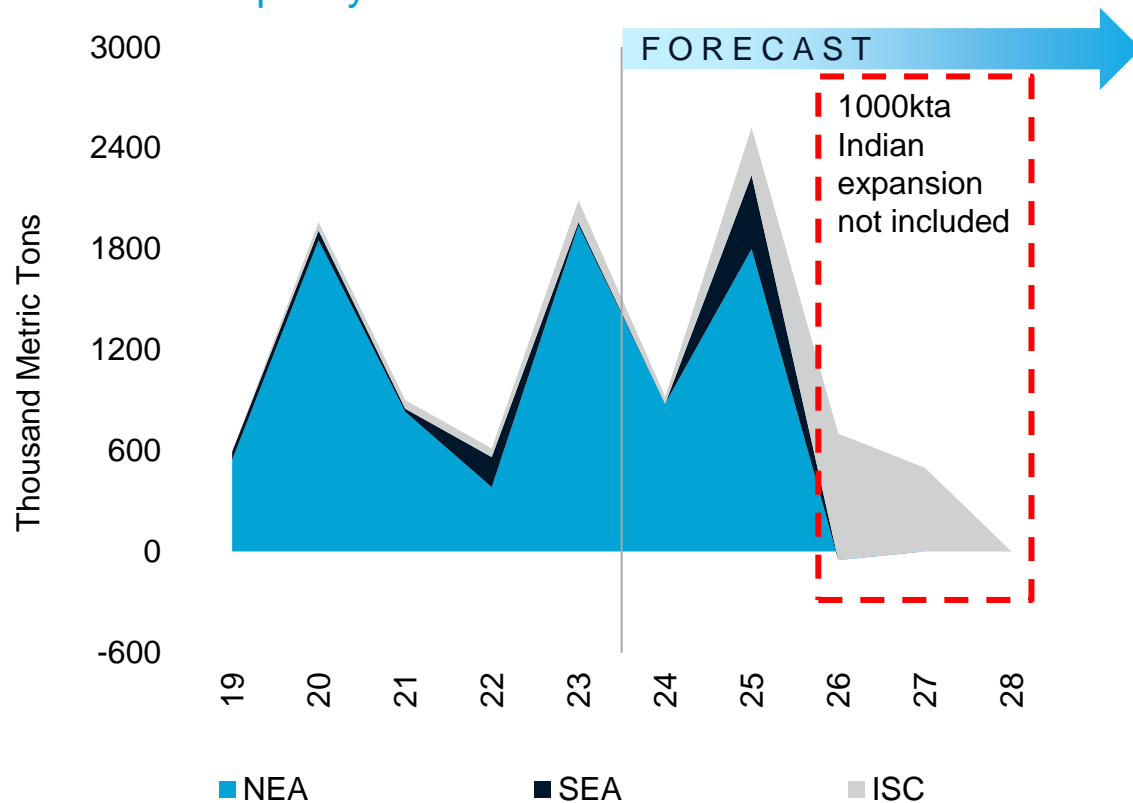
(5% PVC demand growth AAGR 2024-2028)

- Relocation of capital
- Chandra Asri EDC project

*# No: World population ranking

ISC and SEA region strong incremental demand growth will drive supply expansion...

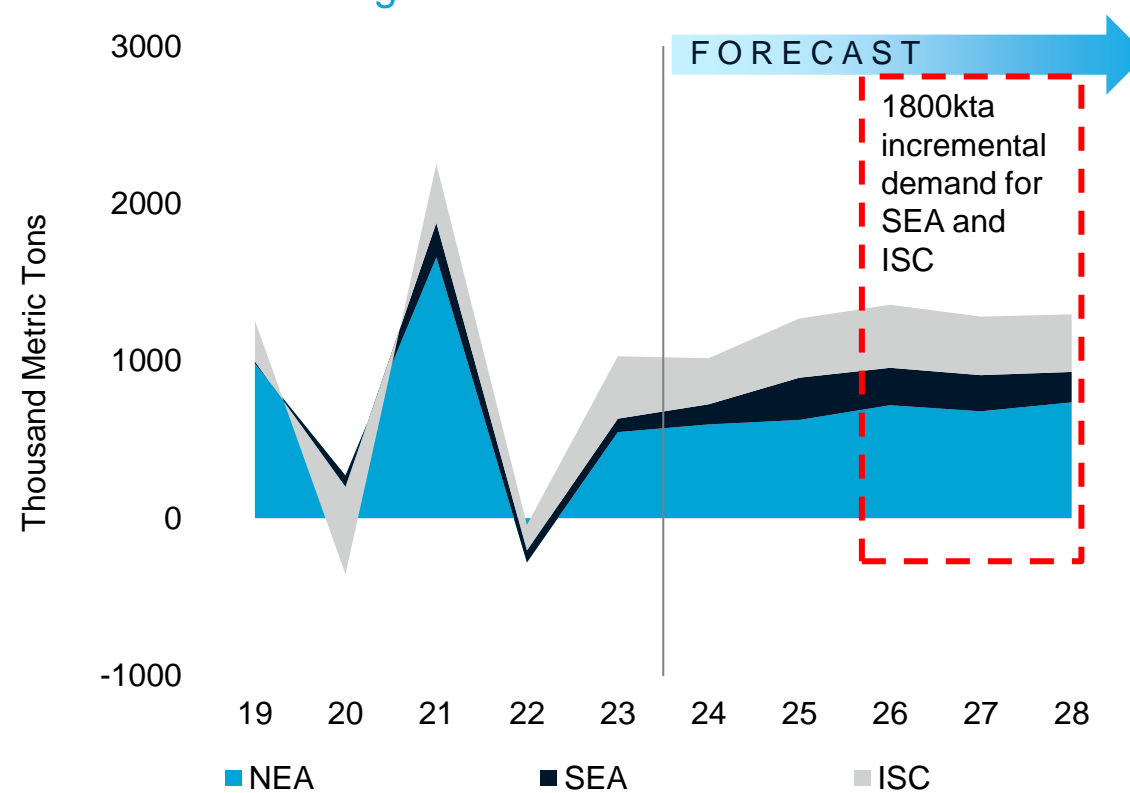
Asia PVC Capacity Growth



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Asia PVC demand growth



Source: Chemical Market Analytics by OPIS

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Demand growth center shift to ISC and SEA, driving investment decisions

- SEA and ISC may see a net increase of around 3 million metric tons of PVC from 2024 to 2028. Mainland China net increase approx. 1500kta
- PVC demand growth in NEA is expected to fall below GDP while SEA and ISC will maintain above GDP growth level.

Region	GDP %	PVC Demand, %	
	2023	2023	AAGR 2024-28
ISC	5.8	21	7.2
SEA	3.2	3.5	5.6
NEA	4	1.4	2.4

Mainland China

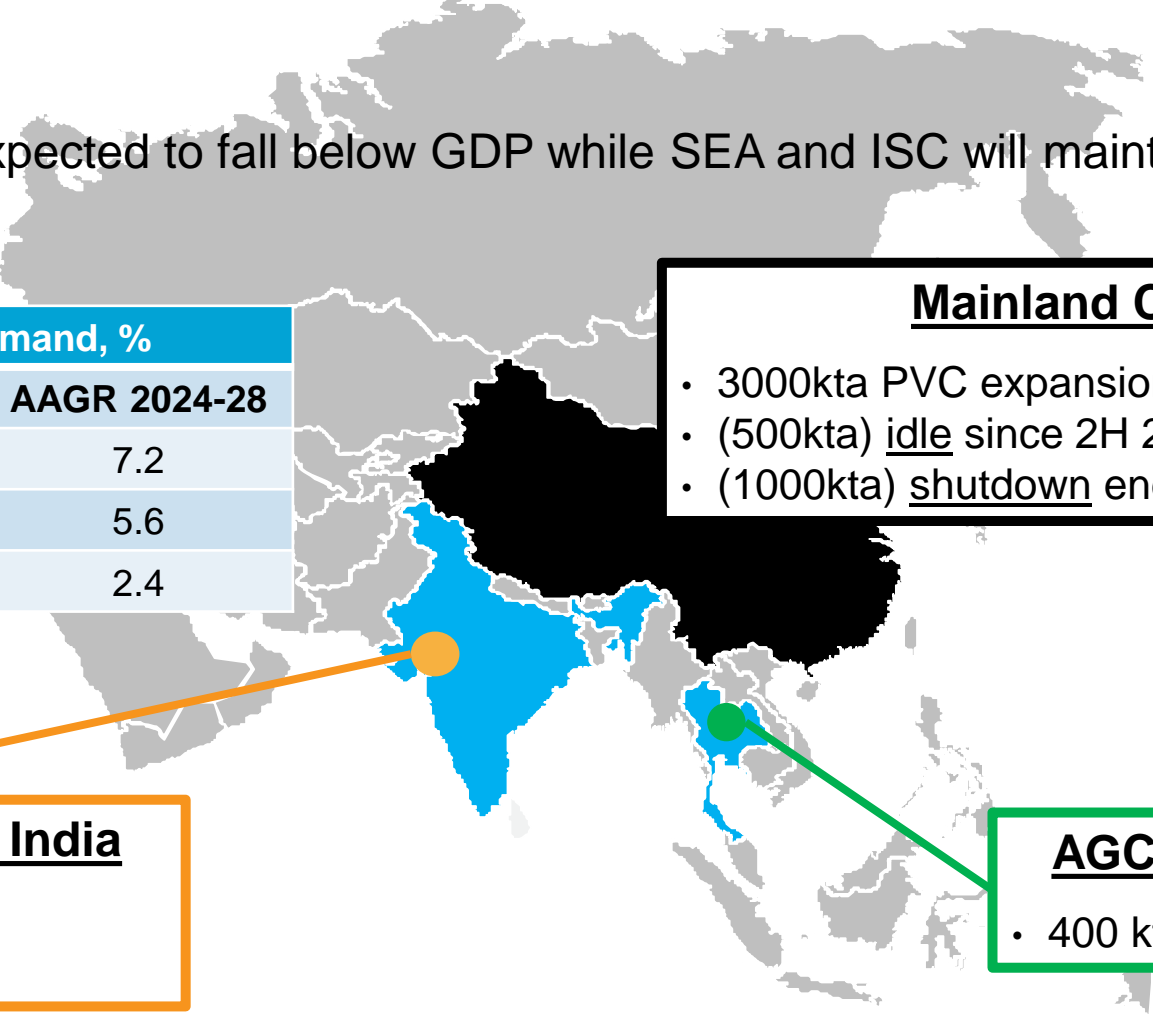
- 3000kta PVC expansion 2024~2025
- (500kta) idle since 2H 2023.
- (1000kta) shutdown end-2023 to 2024.

Reliance & Adani projects in India

- Reliance 1250kta of PVC
- Adani 1000kta carbide PVC

AGC Vinythai in Thailand

- 400 kta PVC expansion in 2025

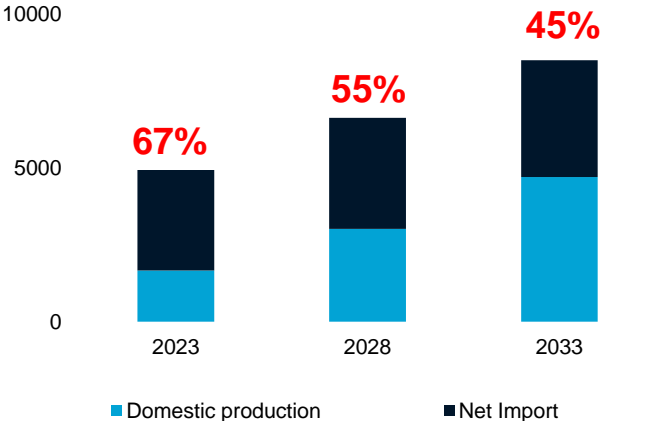


Challenges and Opportunities



Regional PVC self-sufficiency changes dictate future PVC trade flows

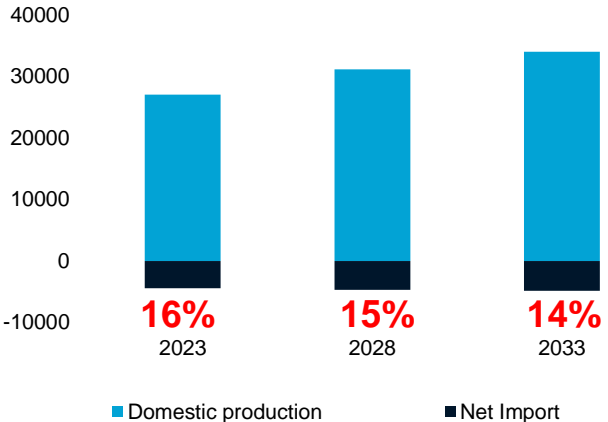
ISC self sufficiency



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ISC Net import % is expected to drop as new projects kick in to meet domestic demand, and by 2033 self-sufficiency improve to more than 50%.

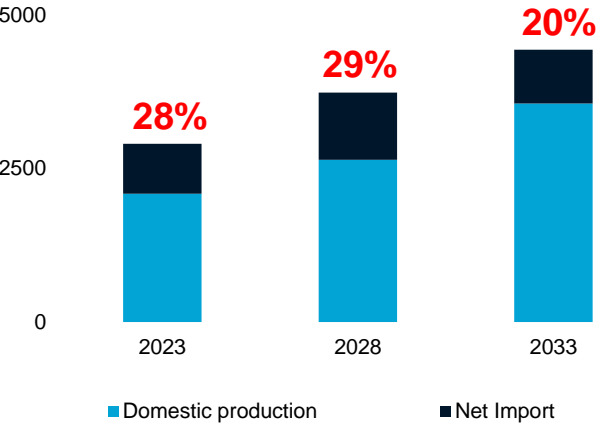
NEA self sufficiency



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NEA net export % marginally lower, less large expansion within the next 10 years as demand growth moderate

SEA self sufficiency

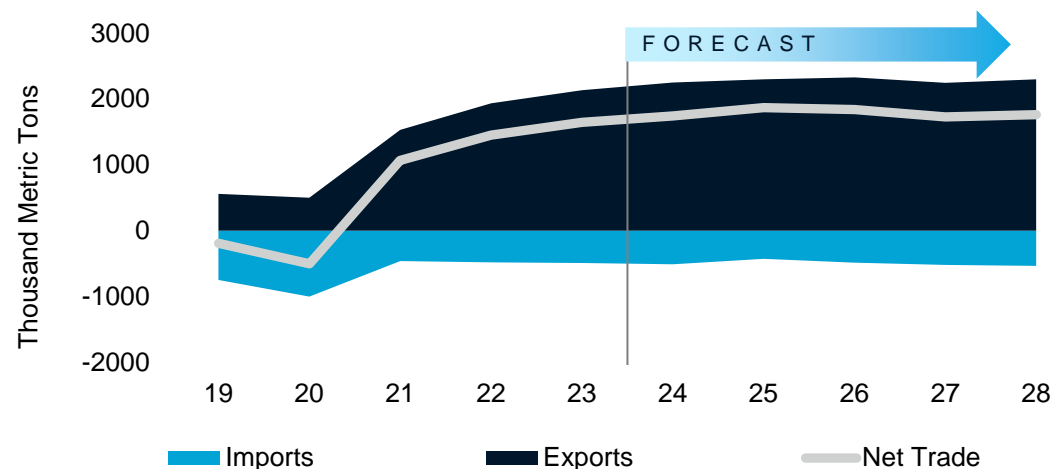


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SEA net import % stable to decline as forecasted expansion kick-in to meet domestic demand.

Major shift in mainland China PVC trade position

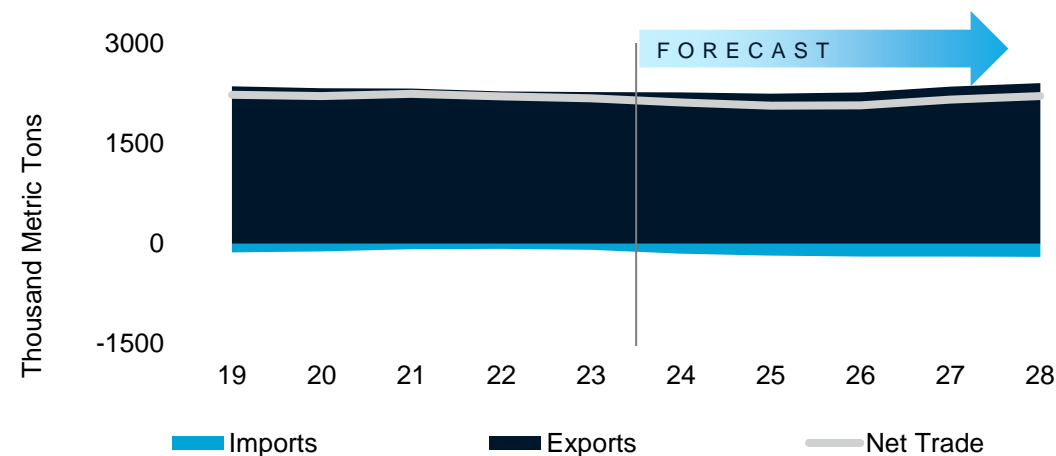
China(mainland) PVC Net Trade



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Other Northeast Asia PVC Net Trade



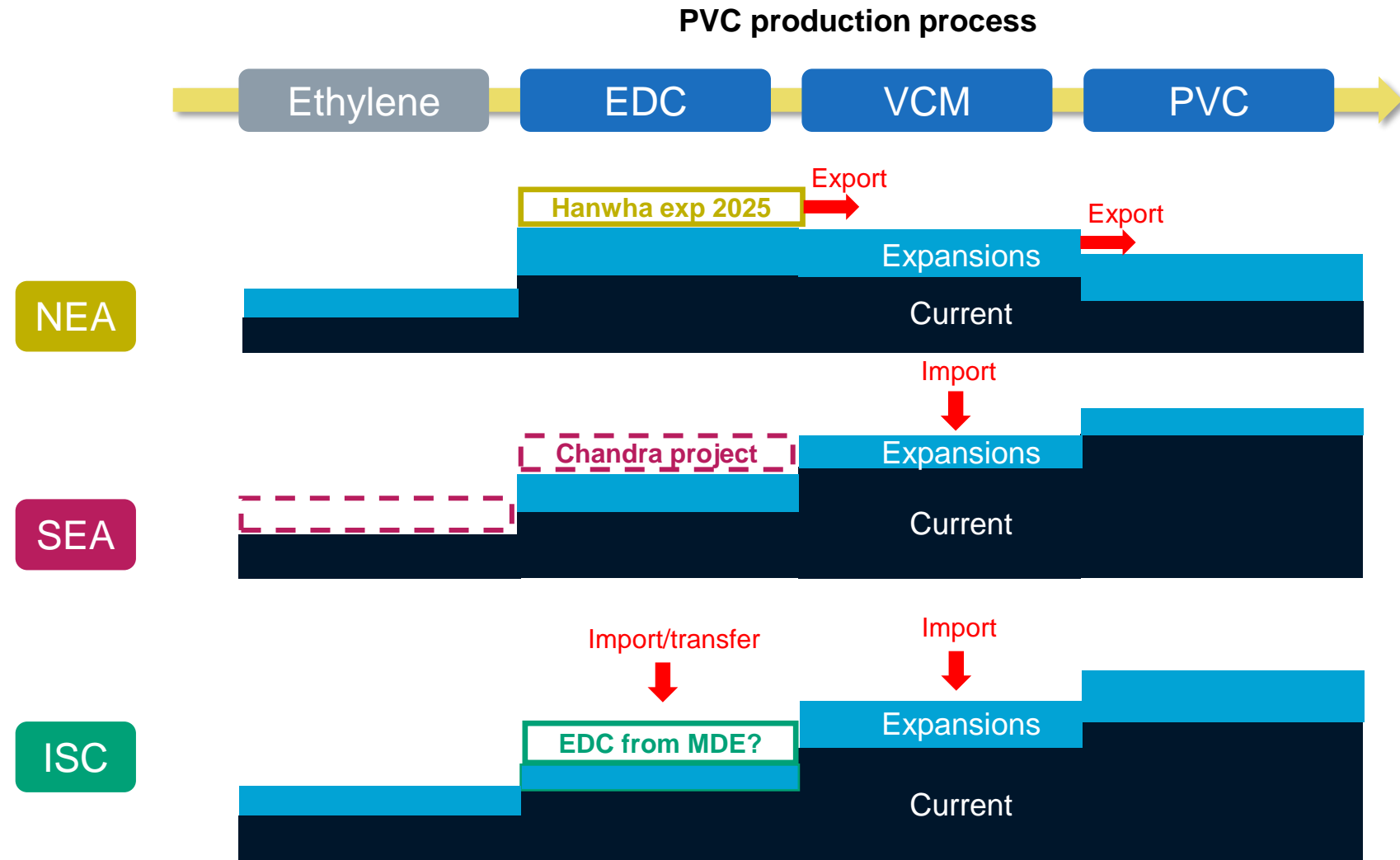
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- Exports will play a vital role in supporting domestic supply/demand balance
- RMB depreciation improves the competitiveness of China-sourced PVC in the international market
- Project Chinese net exports to average around 1.8 to 1.9 million MT per year for the forecast period.
- Making up over 50% share of NEA region export.

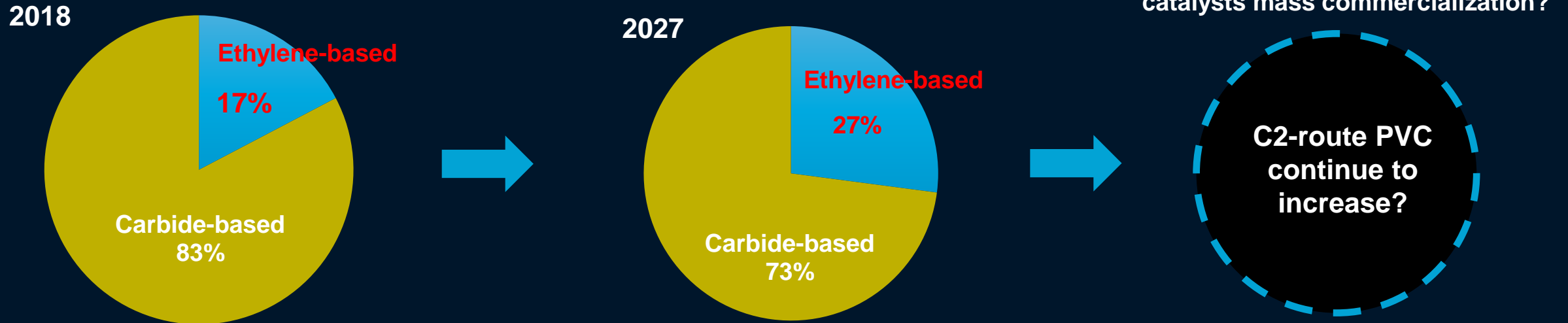
Next five years changes in Asia EDC balance

- All three regions trying to expand EDC integration
- NEA will be major source of EDC and VCM supply for the Asian region
- SEA could become more self-sufficient on EDC with Chandra Asri expansion
- Is MDE EDC project still valid to support EDC requirement in India?



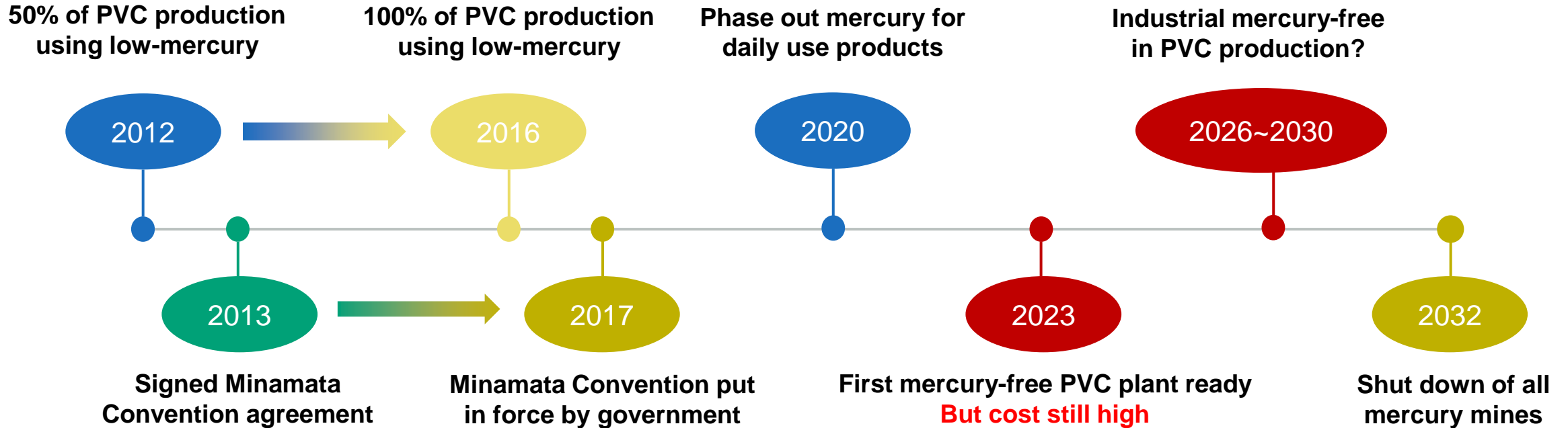
Ethylene-route PVC capacity gaining share

Mainland China PVC capacity distribution



- Ethylene-route PVC capacity share to increase by 10%
- Big integrated & competitive carbide-based producers will maintain or expand its capacity.
- Non-integrated carbide-based producers at highest risk of closure

Carbide-based PVC process remains relevant



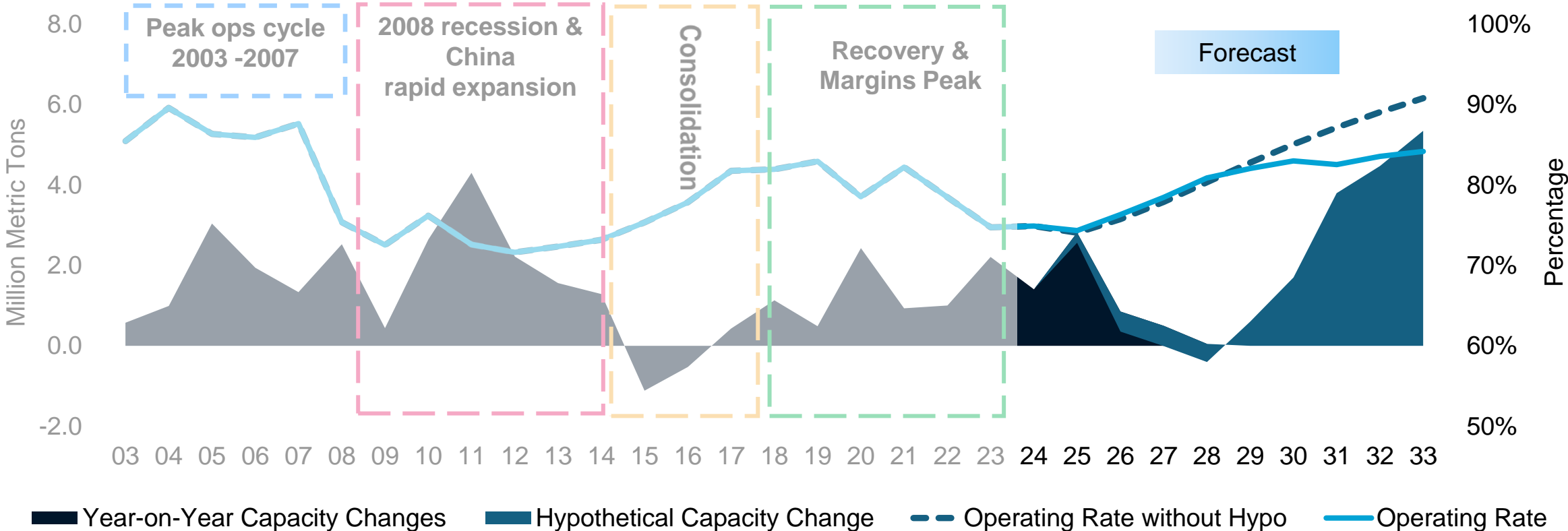
Precious metals catalysts trial	Tianjin Dagu, Xinjiang Tianye, Xinjiang Zhongtai, Shaanxi Jintai, etc. <i>Johnson Matthey, Inner Mongolia Haichi</i>
Non-precious metals mercury-free catalysts	Erdos CA, Xinjiang Tianye, Dezhou Shihua.

Recovery Path



Recovery and rebalance with next peak ops cycle expected after 2028

Global Year-on-Year Capacity Change Versus Operating Rate

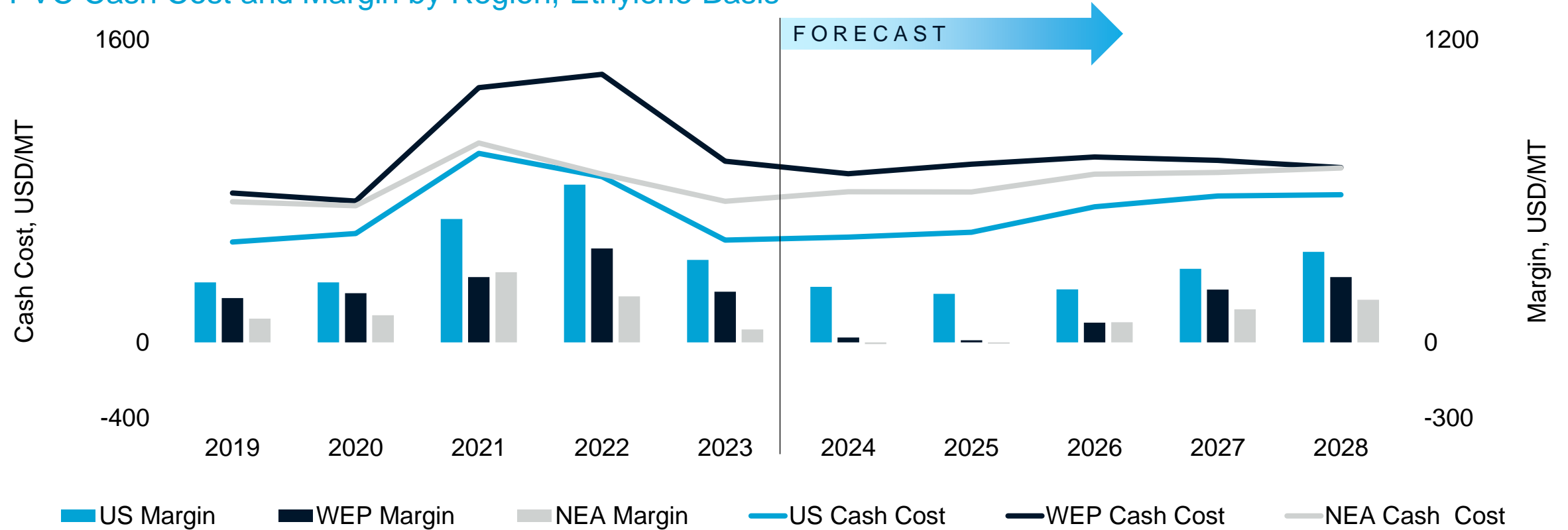


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Extended period of low margins

PVC Cash Cost and Margin by Region, Ethylene Basis



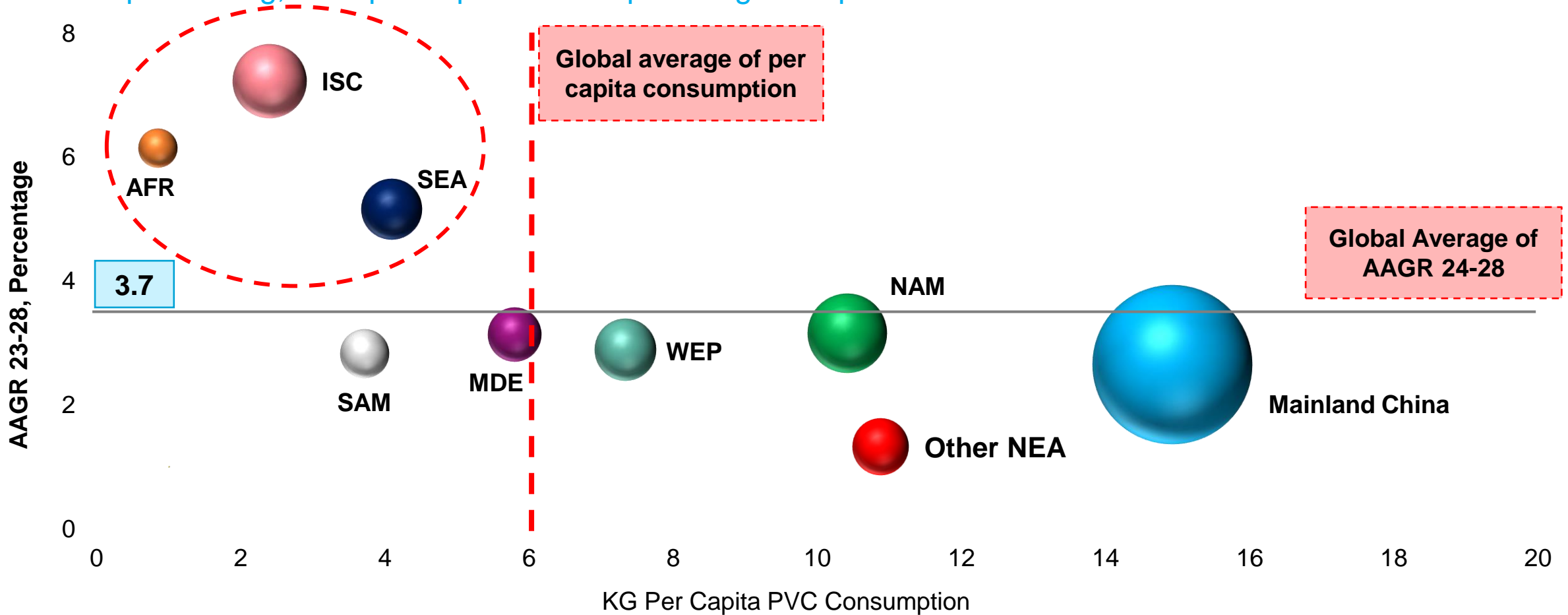
Source: Chemical Market Analytics by OPIS

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	NEA (except China)	Mainland China	SEA	ISC
Opportunity	<ul style="list-style-type: none"> Mature market Better ethylene availability 	<ul style="list-style-type: none"> More ethylene-based PVC expansion targeting export market <p>Transforming</p>	<ul style="list-style-type: none"> Strong demand growth Expansion projects 	<ul style="list-style-type: none"> Strong demand growth Expansion projects
Challenge	<ul style="list-style-type: none"> Little to no expansion Limited ability to expand 	<ul style="list-style-type: none"> Population growth turns negative Government policy driven 	<ul style="list-style-type: none"> Ethylene availability Lack of intermediate materials 	<ul style="list-style-type: none"> Ethylene availability Lack of intermediate materials

Per capita PVC consumption reveals promising regions

Relative positioning, PVC per capita consumption & growth potential



Source: Chemical Market Analytics by OPIS

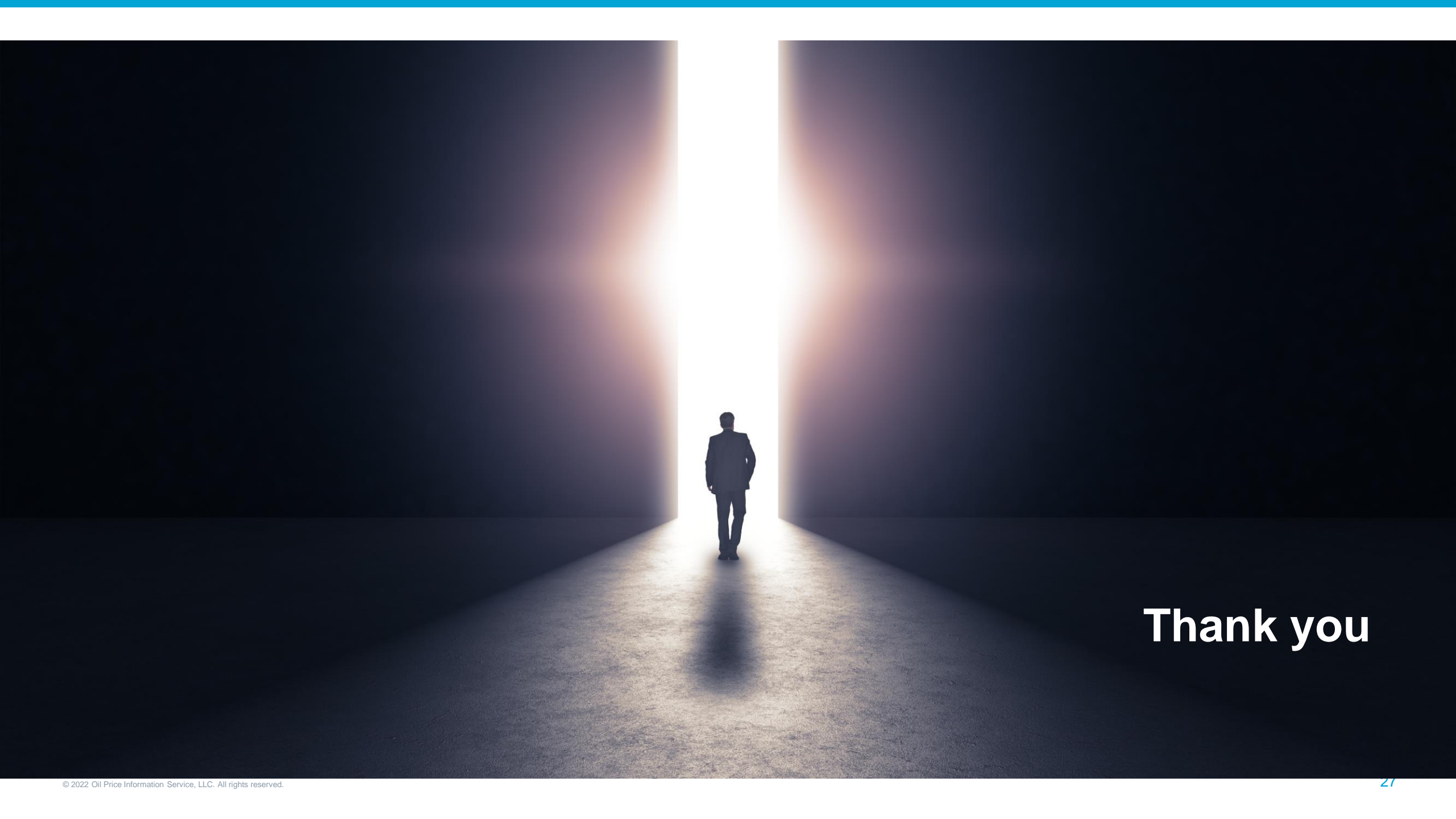
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Key Takeaways

- Mainland China: Consolidation and increased trade are needed to mitigate imbalance & speed up recovery.
- ISC & SEA: Deficit in vinyl molecules is driving expansion and integration.
- Long-term PVC trade flow changes will be dictated by supply/demand changes in Asia
- Low margins period with next peak cycle expected to be around end of the decade

An opportunity to evaluate options and make strategic decisions that will impact your future





Thank you