

# Argus Chlor-Alkali Outlook



Chemicals

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Commodity Markets Intelligence

**Consulting & Forecasts**

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Subscribers can download 24 months of forecast and energy assumption data.

Argus Chlor-Alkali Outlook reference and modeling approach is available online.

# Outlook dashboard: Challenging economic fundamentals ahead

## Chlorine demand and ECU cost pressures to support caustic soda pricing

### What's changed

▼ **Caustic soda:** Falling export prices in northeast Asia and rising European domestic prices have reopened the arbitrage window to Europe and new fixtures have been concluded. Northwest Europe's power price outlook has risen again, intensifying ongoing concerns around ECU cash costs at producer and production costs at end user level. US Gulf export prices have softened, but lower chlorine demand keeps away any caustic soda volume pressure. Chlorine offtake in Asia and Europe are also lower, with Europe seeing the most significant demand reductions. Caustic soda demand is dropping at a slower pace than that for chlorine.

### Price Forecasts (USD/dmt)

August 22    September 22    October 22    November 22    December 22

Region/Type	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
NE Asia fob					
US Gulf fob					
Northwest Europe domestic					

*Data available to subscribers*

\*Forecasts for monthly or quarterly contracts that are under active negotiation at the time of publication are redacted from publication, to avoid influencing discussions.

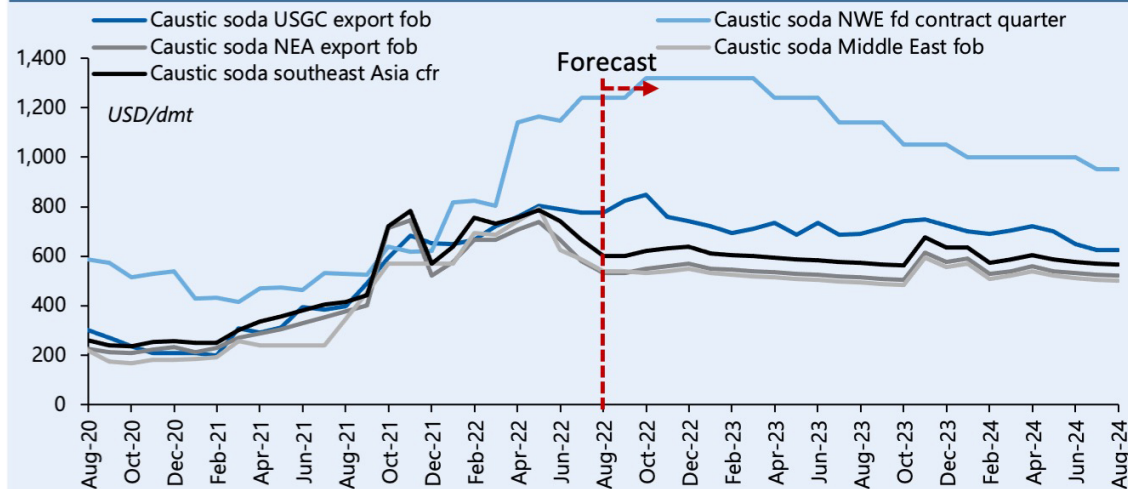
### Short term view, quarter ahead

▼ **Caustic soda:** Renewed export opportunities from northeast Asia to Europe may help stabilise northeast Asian export prices. In the US, soft chlorine offtake may prompt export prices to rebound, while in Europe the higher electricity price outlook may continue keep caustic soda prices under upward pressure.

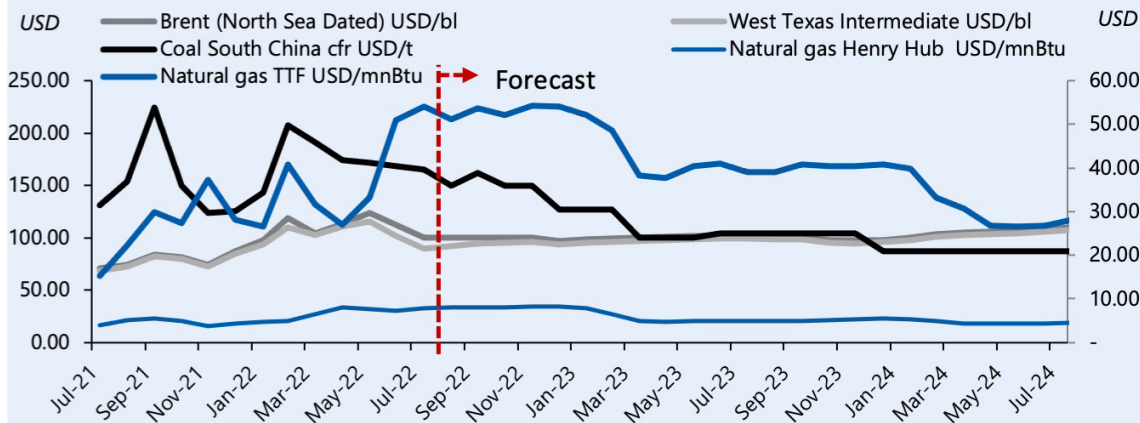
### Long term view, 24 months view

▼ **Caustic soda:** All key regions are anticipated to see challenging economic fundamentals and possibly recessionary conditions. They are likely to trigger further demand erosion for chlorine and caustic soda, with the former possibly more pronounced than the latter. The net effect may be renewed caustic soda price increases.

### Caustic Soda Price Forecast



### Energy Price Outlook



Region	Forecast Data	Unit	08/22	09/22	10/22	11/22	12/22	01/23	02/23	03/23	04/23	05/23	06/23	07/23	08/23	09/23	10/23	11/23	12/23	01/24	02/24	03/24	04/24	05/24	06/24	07/24	08/24	
NAM	WTI	USD/bbl																										
	Natural Gas	USD/mnBtu																										
	Electricity	USD/KWH																										
	Caustic soda Export fob USGC	USD/dmt																										
	ECU Cash Cost	USD/ECU																										
NWE	Natural Gas TTF	USD/mnBtu																										
	Electricity	USD/KWH																										
	Caustic soda Northwest Europe Domestic Contract	USD/dmt																										
	Caustic soda Northwest Europe Domestic Contract	€/dmt																										
	ECU Cash cost	USD/ECU																										
NEA (China excluded)	Electricity	USD/KWH																										
	Coal South China cfr (5,500kcal/kg)	USD/t																										
	Caustic soda Export fob NEA	USD/dmt																										
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# Americas review

## PVC production slows, limiting availability of caustic soda co-product

SUPPLY

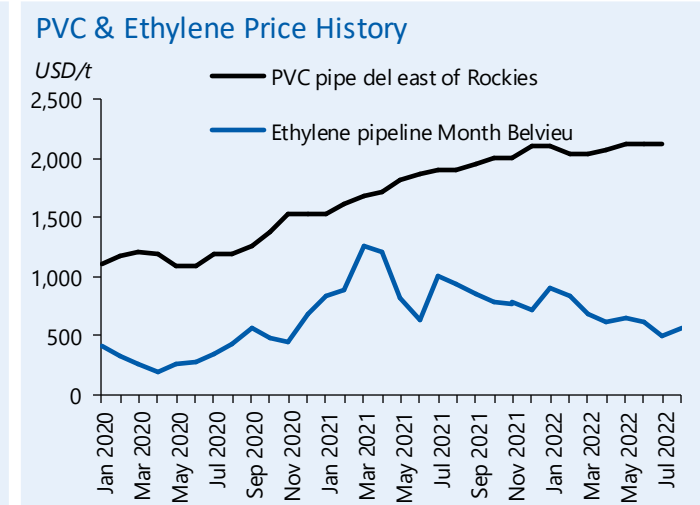
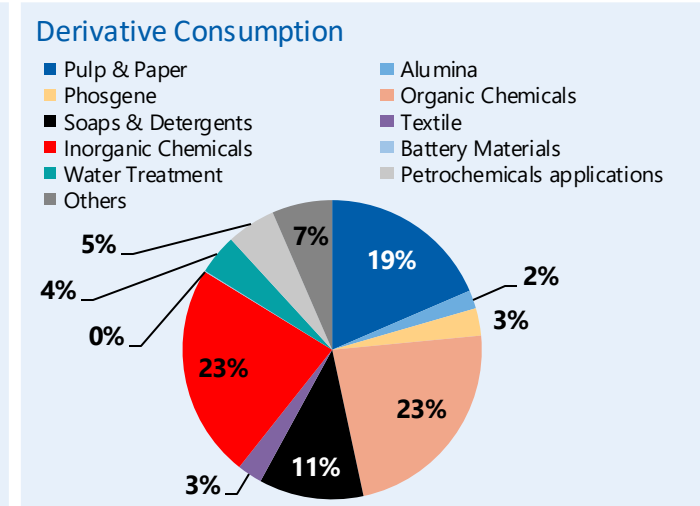
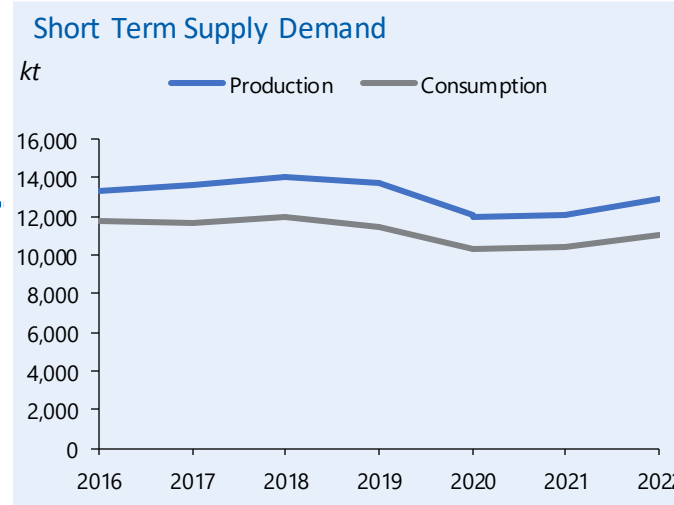
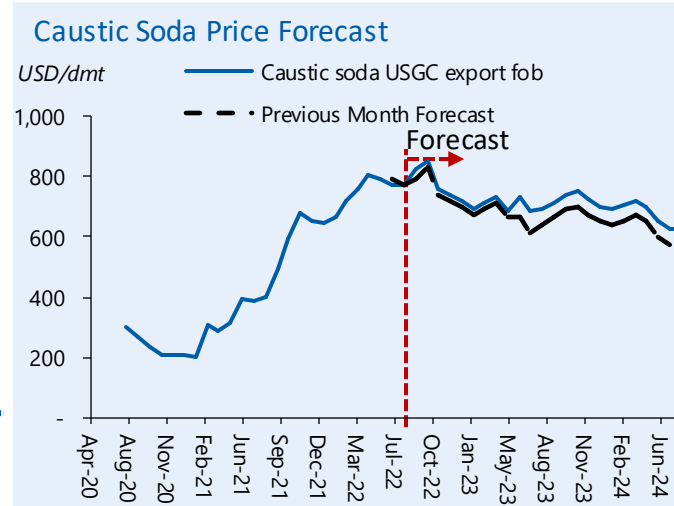
- ▶ Slowing PVC production is leading US producers to increase EDC exports to meet caustic soda contractual demand. Some slowing of isocyanates production as well as epichlorohydrin production are reducing caustic soda availability.
- ▶ Weakening housing data in the US and Canada are anticipated to reduce PVC demand over the next couple of months, leading to lower availability of caustic soda from the US Gulf coast. Some of the weakness in the US PVC market will be offset by higher EDC and PVC exports.
- ▶ The global EDC market is weak with producers pushing more volume into a limited market, but later in the year, additional volumes of EDC and caustic soda are forecast to be exported to Europe as a plant in Plaquemine, Louisiana, increases operating rates in August. The increased production of EDC will have a limited impact on the market as EDC and caustic soda are expected to be exported in ECU balanced quantities.

DEMAND

- ▶ Caustic soda demand in the domestic US market is holding up well in light of the slowing economy. Only some pockets of weakness are visible. Pulp and paper demand are expected to remain robust through the end of 2022 and into 2023.
- ▶ Demand for caustic soda into the alumina market is slightly weaker than anticipated in August as one alumina refinery in the Americas struggles to ramp up operations and offtake into European alumina slows. Despite a couple of cancelled parcels, caustic soda demand into this segment is forecast to increase through the end of the year. Slowing GDP growth rates are expected to weaken caustic soda demand over the next several months.

SENSITIVITY

- ▶ Hurricane season has been exceptionally slow so far this year, however it is forecast to be an active season. This means that hurricane activity is anticipated to increase in the coming months. Some minor impacts such as "safety stops" at a couple of plants are anticipated in September and August, but no sustained plant shutdowns are incorporated into the forecast.
- ▶ The US Gulf coast may be called upon to supply more products to Europe over the next several months as sustained high energy prices make the production of some products uneconomical.
- ▶ A more rapid deterioration of economy may slow demand for caustic soda into alumina, pulp and paper, and other derivatives. This may offset slowing demand for chlorine into the vinyls segment.



# Northwest Europe review

## Chlorine production cuts limit caustic soda availability

SUPPLY

▶ August is the third consecutive month of substantially weaker chlorine consumption into vinyls in addition to the drop into isocyanates that was evident for the whole of 2022 so far. The significant drop in chlorine offtake puts a strain on caustic soda availability, prompting producers to allocate product carefully and withdraw from the export market. But supply is still perceived as adequate at customer level and logistics issues for barge, road and rail transport remain their immediate main concern. September is to be a critical month as it may show the extent of any chlorine demand recovery into vinyls after the summer lull and also set the scene for the coming months.

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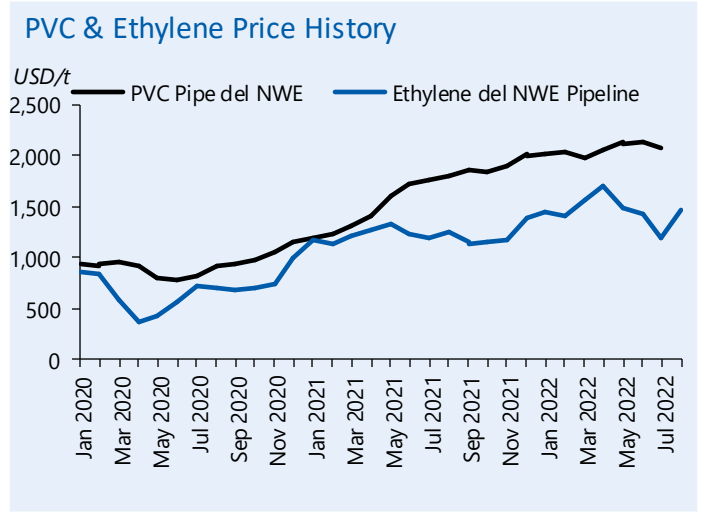
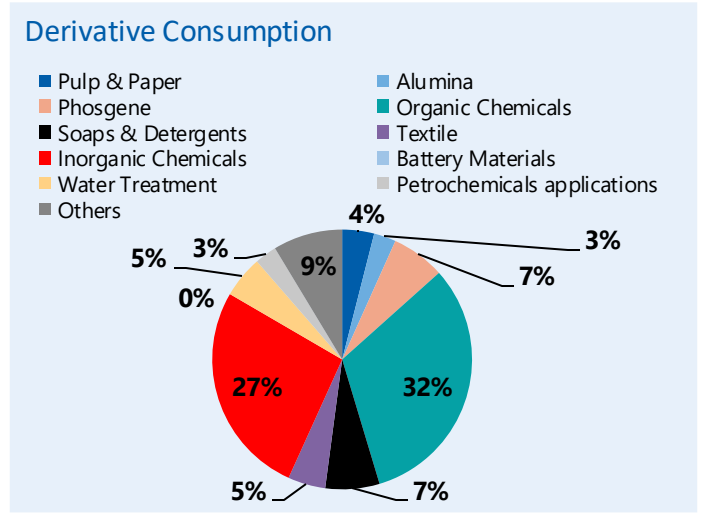
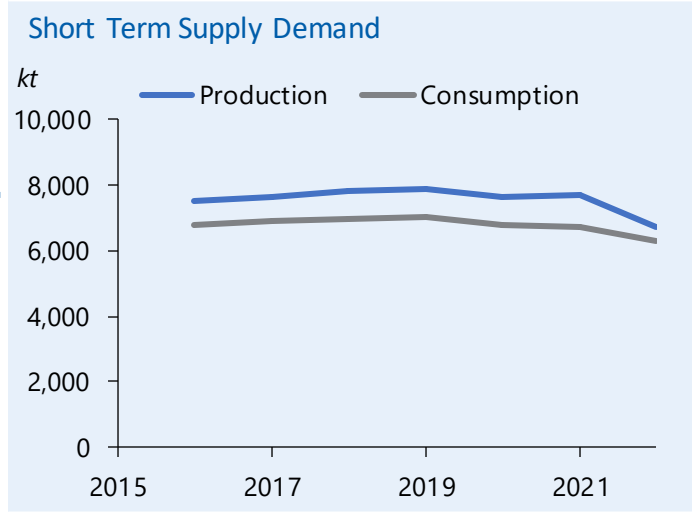
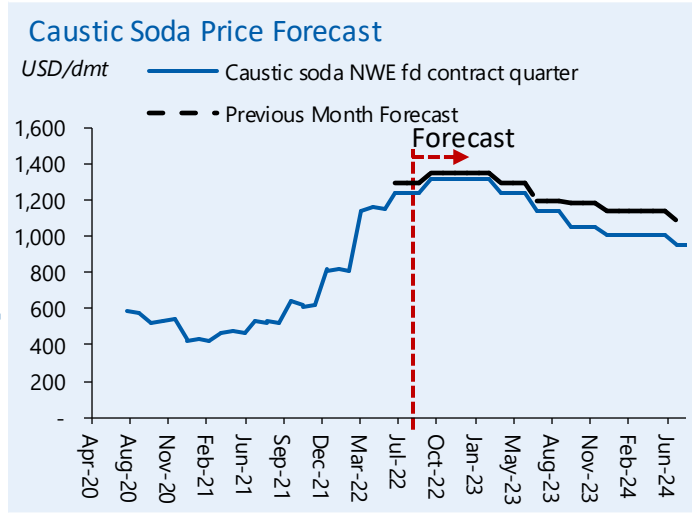
DEMAND

▶ Caustic soda offtake is holding up better than that for chlorine, but is lower due to the high energy and raw material costs and challenging economic environment. Some energy intensive industries, such as alumina, are seeing a clear downward trend in caustic soda consumption as producers cut rates, and there are also declines in offtake for some pulp and paper grades. Buyers in other sectors have also cut rates either due to declining demand for their end products or too high raw material costs and offtake may continue to erode in the coming months. But the overall caustic soda demand erosion is still on a small scale and concerns over supply security still outweigh any concerns over future offtake.

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SENSITIVITY

▶ The energy crisis has taken Europe's high cost and high price position to another level. The region will battle high power and raw material costs for the remainder of the year at least, which has the potential to severely disrupt supplies and offtake. Either could also be impacted by producers' pressure to maintain or raise caustic soda prices and by customers doing the same for their end products. The higher caustic soda selling prices may attract renewed overseas imports, which may fill some supply gaps but are unlikely to erode domestic prices significantly as long as exceptionally high power costs pressure the industry.



# Northeast Asia review

## Increased export availability depressed export prices

SUPPLY

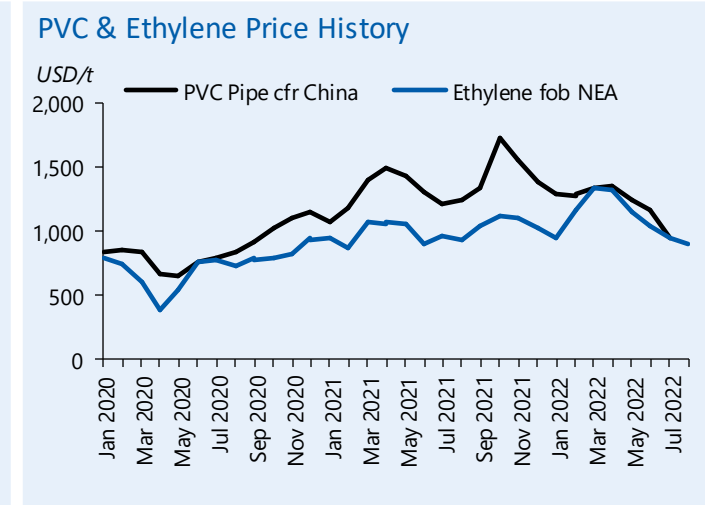
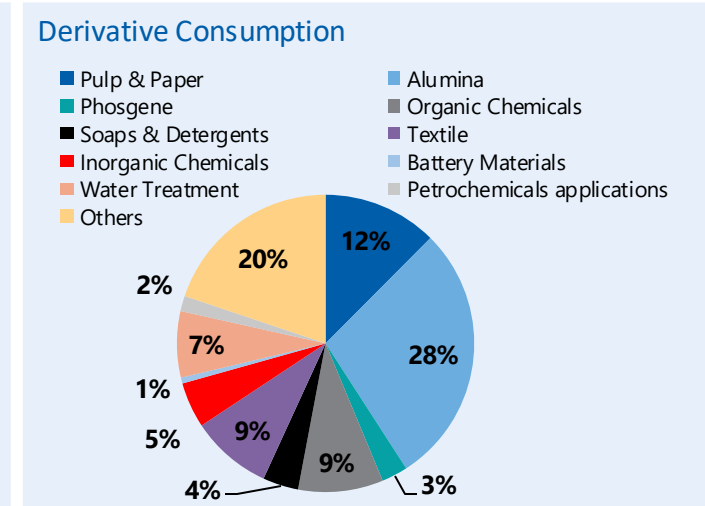
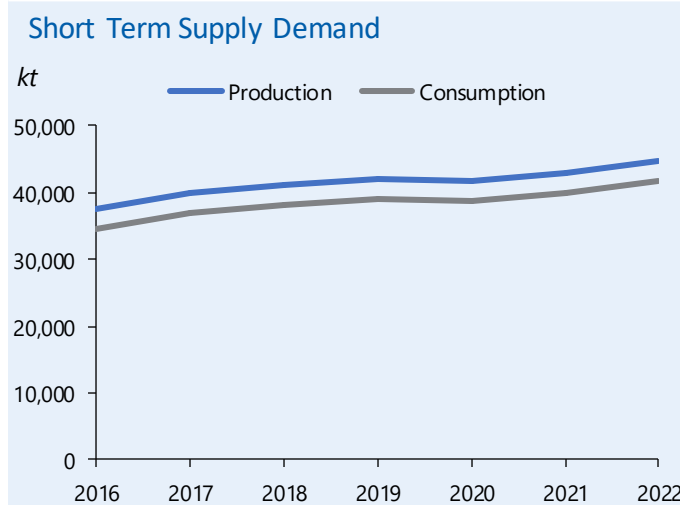
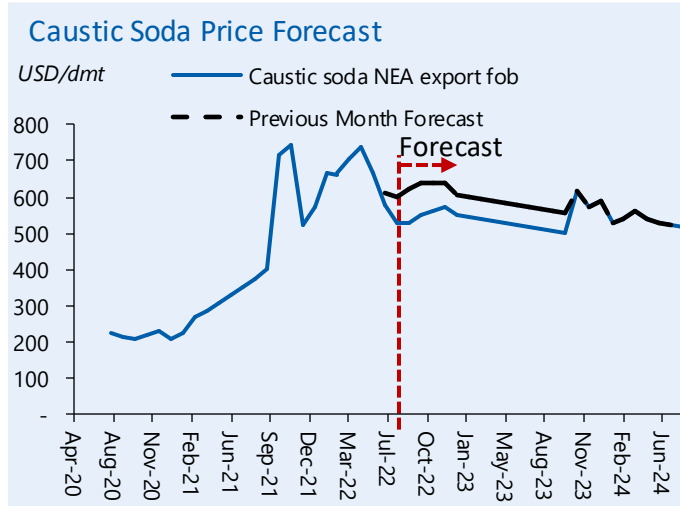
- ▶ The supply position in northeast Asia remained long, as producers continued to offload excess cargoes into the export market due to slowing domestic consumption and to slow down further erosion of domestic parity prices and operating margins.
- ▶ Although there are increasing number producers indicating cutting back their run rates, there are no clear reduction in availability. Furthermore, no ongoing major maintenance reported in the region.
- ▶ China's average chlor-alkali run rates dipped slightly to 77pc, a little lower than peak time. But it's considered as a steady and normal production output rates.

DEMAND

- ▶ Demand for caustic soda from alumina sector and other broader downstream industries in the domestic markets across Asia are slowing down.
- ▶ Demand for export were subdued as buyers are getting increasingly cautious as the downtrend emerged has become more evident.
- ▶ Arbitrage window might re-emerge with the fast-falling export fob prices and dropping freight rates for the Americas and European markets with prevailing high domestic parity prices of caustic soda in those markets.
- ▶ Price support for northeast and southeast Asian cargoes might re-emerge.

SENSITIVITY

- ▶ Northeast Asia is forecast to be the world's largest caustic soda export hub as producers export a certain proportion of production output to maintain a more balanced domestic market.
- ▶ However, southeast Asia, India and Middle East will emerge as a smaller exporting region in near term, though it's smaller than northeast Asia.
- ▶ Forecasting into the future, a clearer supply-demand position will emerge when the European crisis eases and a downtrend market has become more evident. This will help to improve predictability and to reduce price volatility in the region.



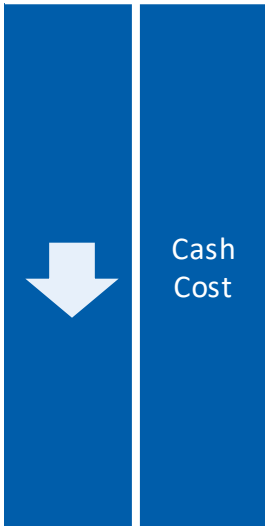


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# Americas cash cost analysis

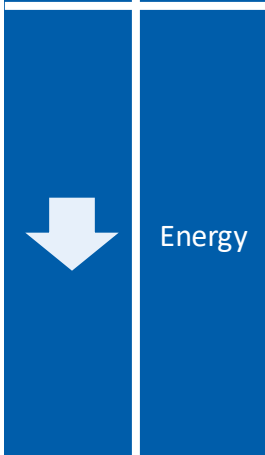
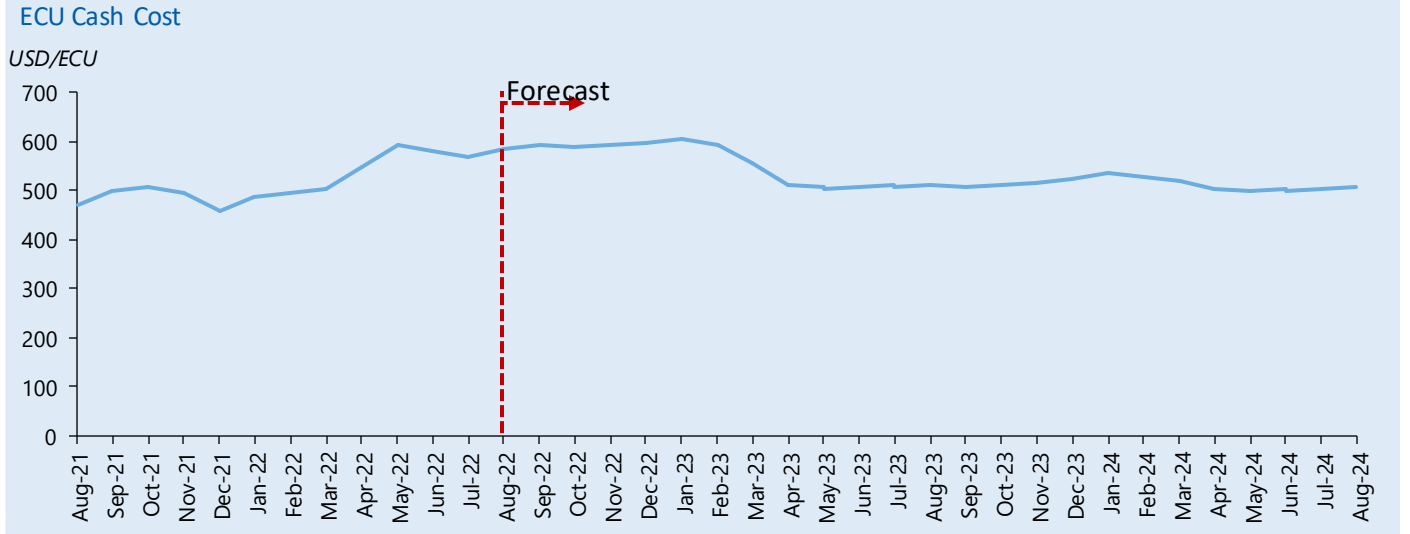
## ECU cash costs elevated by natural gas

### ECU Americas



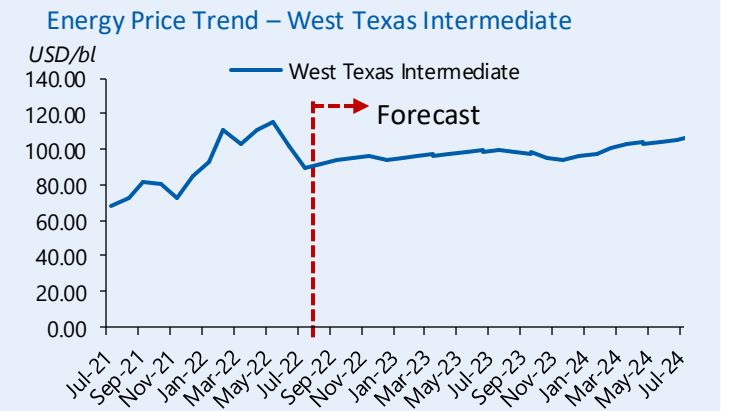
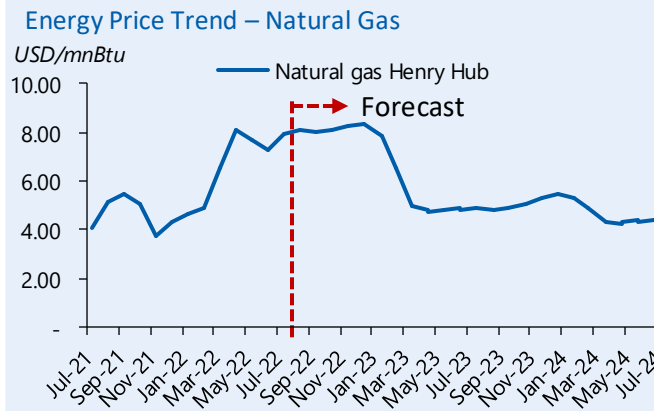
#### Cash Cost

- Above average temperatures in the US have been increasing demand for natural gas to generate electricity.
- Operating rates have slowed in August and should slow further in September as PVC production slows.
- No major issues are forecast to arise from hurricanes in the US Gulf coast.
- ECU cash costs are forecast to increase over the winter months as natural gas prices rise and operating rates slow with weakening GDP growth rates.
- Inflationary pressures continue to impact input costs such as chemicals, freight, and wages.



#### Energy

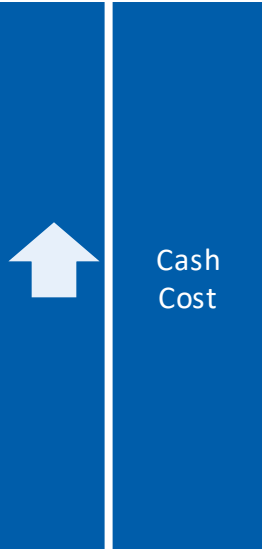
- Henry Hub (HH) natural gas prices started August at 8.360 \$/mmBtu and currently holding steady at 8.70 \$/mmBtu around mid-month. Natural gas prices have risen recently mainly due to the re-opening of LNG Freeport export terminal and continuing hot weather.
- HH price will average 7.54 \$/mmBtu during the second half of 2022, forecast by EIA. This is up by an average of 5.97 \$/mmBtu from their previous forecast.
- The average 2023 forecast price have increased from 4.76 \$/mmBtu to 5.10 \$/mmBtu.



# Northwest Europe cash cost analysis

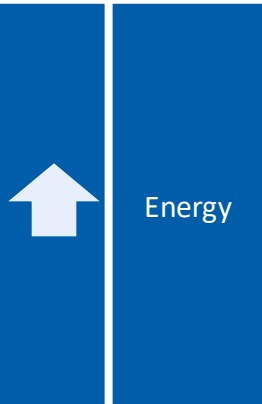
ECU cash costs more stable at higher level

## ECU Northwest Europe



Cash Cost

- ECU cash costs will likely not see any relaxation from the extreme pressures from high electricity prices and producers' cost position is extremely likely to still drive caustic soda prices in the short- and mid-term.
- Our model shows an August average of 1303USD/ECU, taking into account baseload electricity prices at 0.43USD/kWh and average operating rates of around 70pc. Third-quarter caustic soda price increases are supporting ECU margins, but this is being countered by weak chlorine offtake into vinyls and declining PVC prices. It appears as though most sites are either still profitable or are not making significant losses, and that any chlorine production losses stem from reduced offtake rather than cost pressures. Production cuts related to the energy crisis remain a real risk however, as another rise in power prices as well as power rationing remain a possibility.

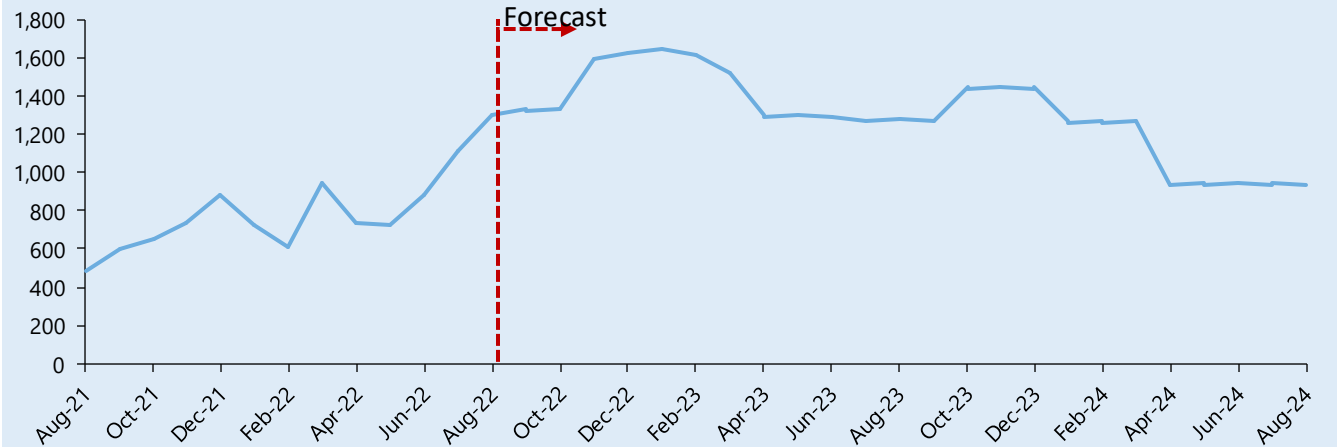


Energy

- LNG fob prices for cargoes loading at the US Gulf coast rose on Monday as a result of gains in the European delivered market.
- Low rainfall has persisted in recent weeks across northwest Europe and has led to water levels at Germany's Rhine river reaching extreme lows. This in turn could support gas fired power demand in the region as some coal-fired units may operate irregularly as a result of low Rhine levels disrupting coal deliveries to certain plants.
- Argus forecasts TTF prices to remain high until the first quarter of 2023 before subsiding.

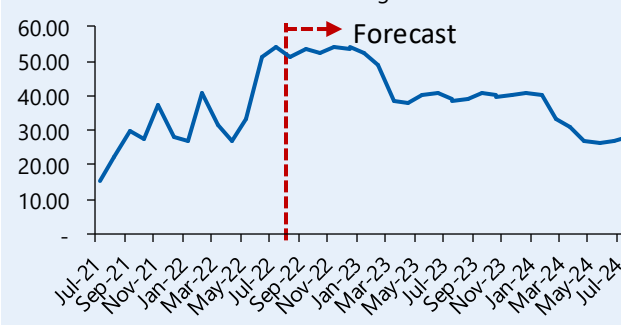
ECU Cash Cost

USD/ECU



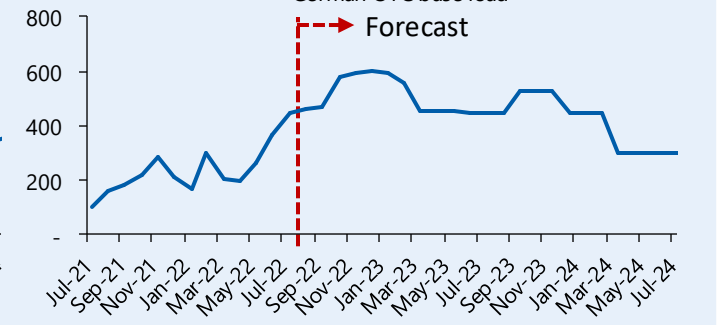
Energy Price Trend – Natural Gas

USD/mnBtu



Energy Price Trend – Electricity

USD/MWh



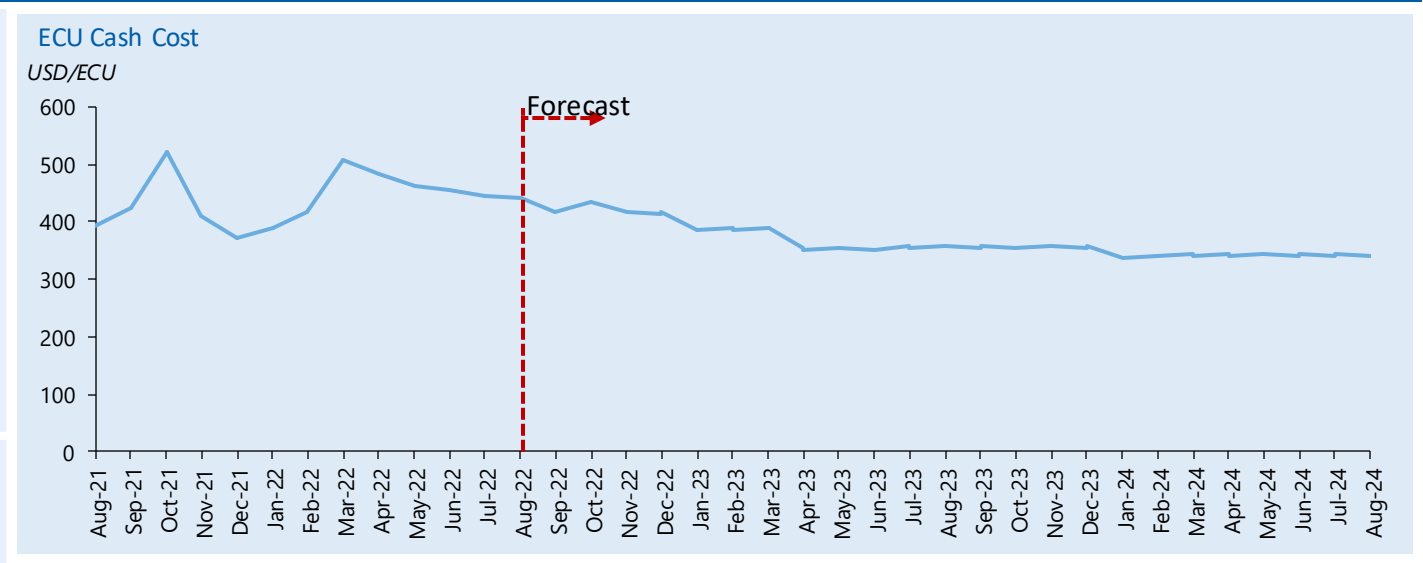
# Northeast Asia (excluding China) cash cost analysis

ECU cash cost among the northeast Asia producers outside China are generally higher than Chinese producers

## ECU Northeast Asia (excluding China)

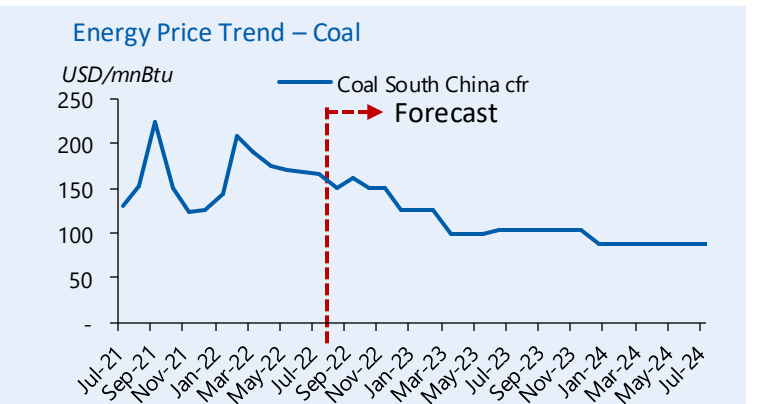
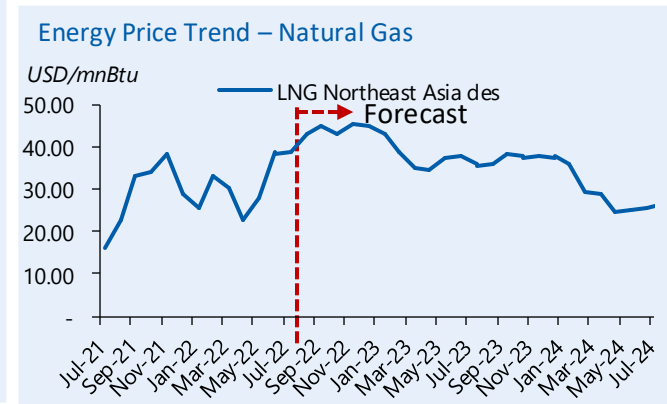
**Cash Cost**

- Most of the chlor-alkali outside China in northeast Asia derived its electricity from the mixed energy sources such as coal, natural gas, nuclear energy and renewables.
- They have to draw their supply mainly from Grid based on commercial rates. But they are mainly from coal-fired power generation.
- The average ECU cash cost were largely steady and remained marginally higher than Chinese producers.
- Current cash cost shows for a stable trend, but forecast to decline on the long term.



**Energy**

- Thermal coal prices are likely to be volatile in the short term due to winter stocking efforts. Forecast price mostly unchanged for this month.
- European and North Asian demand is growing, placing particular pressure on demand for some coal specification. Chinese inventory has been higher, notwithstanding the sharp falls in imports this year.
- Japan's main power utilities have been able to rebuild their LNG stocks in recent weeks after they dropped below previous year's levels during a heatwave that high the country in late June and early July



# China cash cost analysis

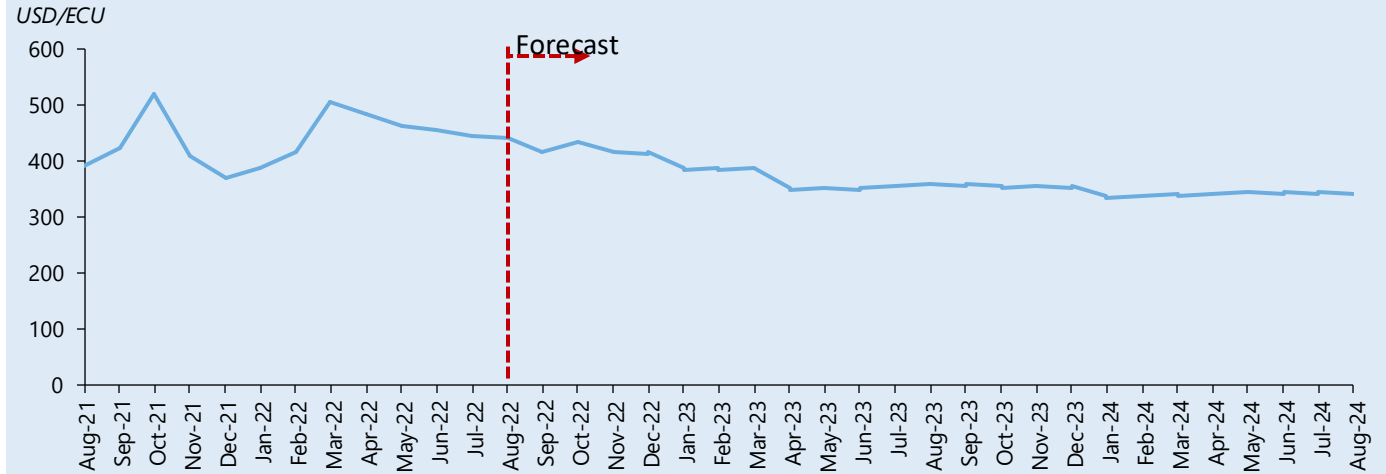
## China's ECU cash cost remained steady

### ECU China

#### Cash Cost

- Average China's Ecu cash cost remained steady at around low \$400/ECU, especially amongst the coastal export-capable producers.
- Inland producers with access to own coal mines or located nearer to the commercial coal mines still able enjoy relatively low power cost.
- Power cost for producers rely on grid is still lower than producers that generate own power supply as power cost from the grid are highly regulated to minimize volatility.
- Producers rely on merchant coals are based on market rates.
- China's ECU cash cost remained marginally lower than other major producers outside China in northeast Asia.

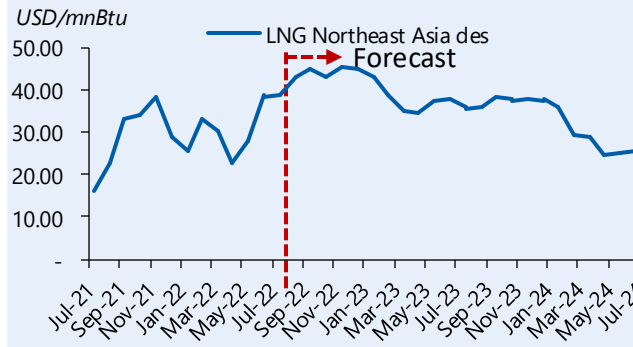
ECU Cash Cost



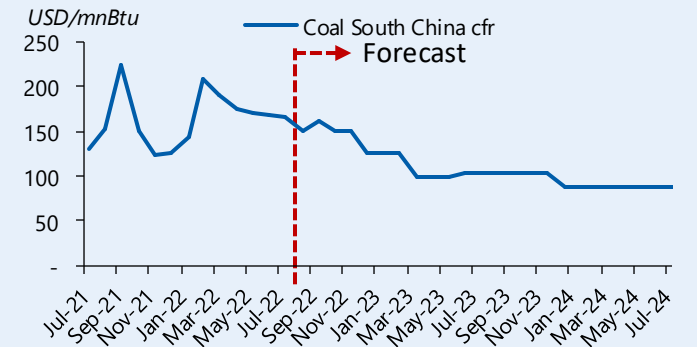
#### Coal

- Thermal coal prices should come down from recent stratospheric level with some compression in spreads based on a 12 year outlook.
- LNG prices forecasted to remain high up until second quarter of 2023. The China Electricity Council has forecast stronger power demand in the second half of this year, as it expects the impact of Covid-19 on the economy to weaken.

Energy Price Trend – Natural Gas



Energy Price Trend – Coal



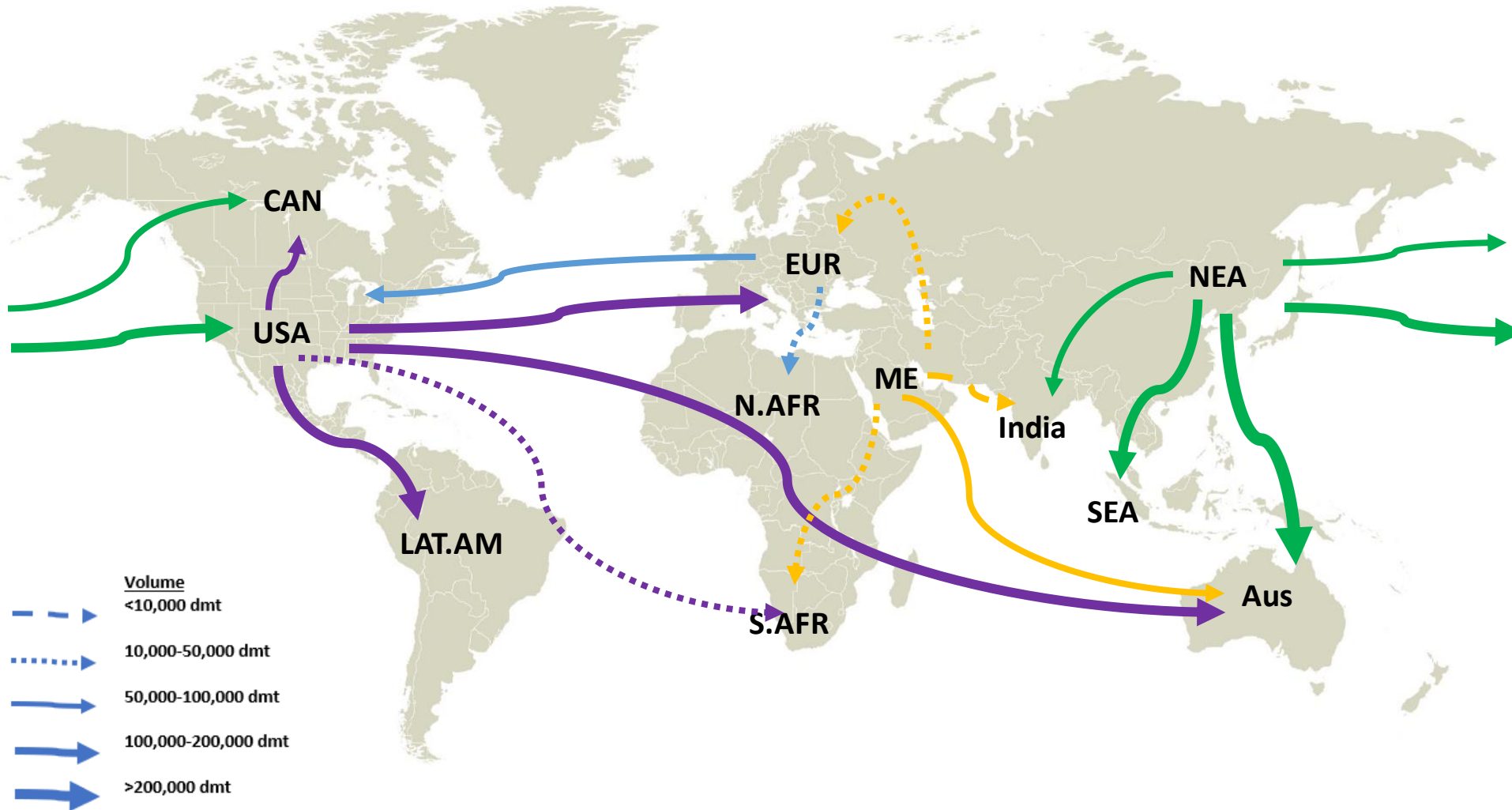
# Major Asia-Pacific Plant Maintenance Schedule

Country	Company	Location	Units	Capacity (kt)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Korea	LG CHEM	Yeosu	CA No1	580					■	■			■	■			
			CA No2				■								■	■	
	Hanwha	Yeosu	CA No1	340											■	■	
			CA No2												■	■	
			CA No4		120												
	LOTTE	Yeosu	CA No 1	210			■	■						■	■		
CA No 3			140											■	■		
Japan	Kaneka	Takasago	CA-EDC	360												■	
	Tokuyama	Tokuyama	CA-EDC	490							■		■				
Taiwan	FPC	Mailiao	CA-EDC	1,333									■				
Indonesia	AMSC	Anyer	CA-EDC	670							■						
China	SP	Taixing	CA-EDC	300+150							■		■				
	Shanghai Chlor-Alkali	Caojing	CA	720							■		■				

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# Global trade flows

Export window from Asia to Europe and Americas emerged.



- Export window to Europe and Americas for Asian cargoes emerged.
- Asian imports are expected to arrive in Europe starting from September
- Freight rates for MR-sized vessels began to decline, allowing for more long-haul trades and traders could target deep-sea destinations.
- Freight rates for small vessel remained high and vessel space availability were tight



# Northwest European trade analysis

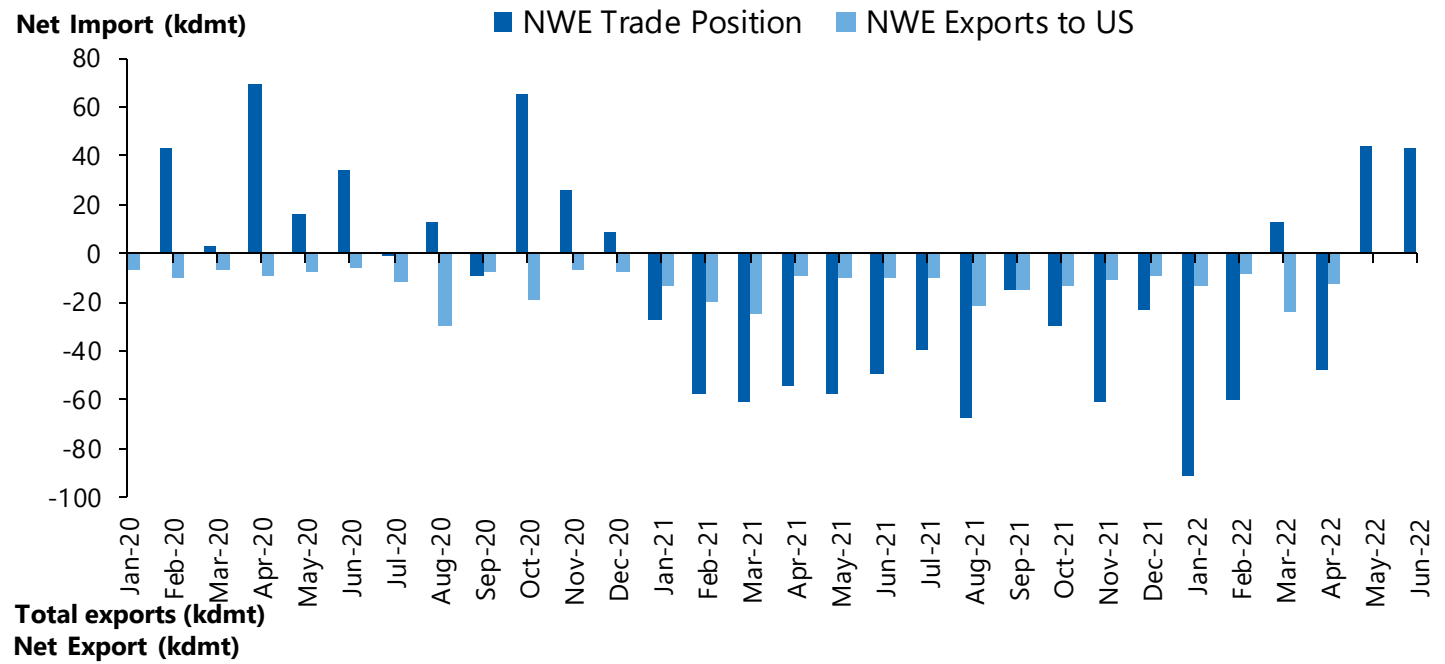
## Export interest to remain low



\*Largest production sites by capacity

— Chemicals

Producers are likely to withdraw from the export market in light of the ongoing chlorine production cuts and the uncertain chlorine demand outlook. The output losses have started to tighten the market, and sellers may increasingly focus on local customers at the expense of export allocation. Local sales are more attractive at third-quarter prices in the €1,090-1,355/dmt fd range versus export prices around \$900/dmt fob. Higher export price ideas could remain incompatible with landed prices in the target markets. Instead, importers continue to assess opportunities for bringing in overseas material for their own consumption or re-selling.

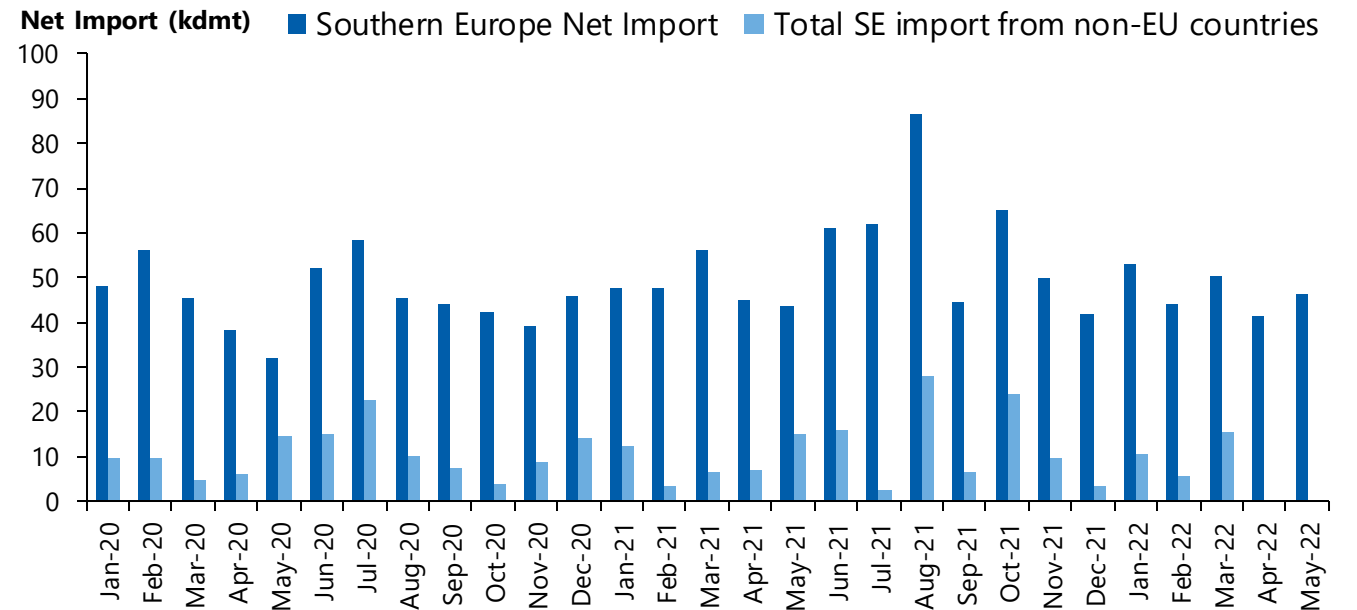


# Southern Europe trade analysis

## Import activity to rebound after holidays

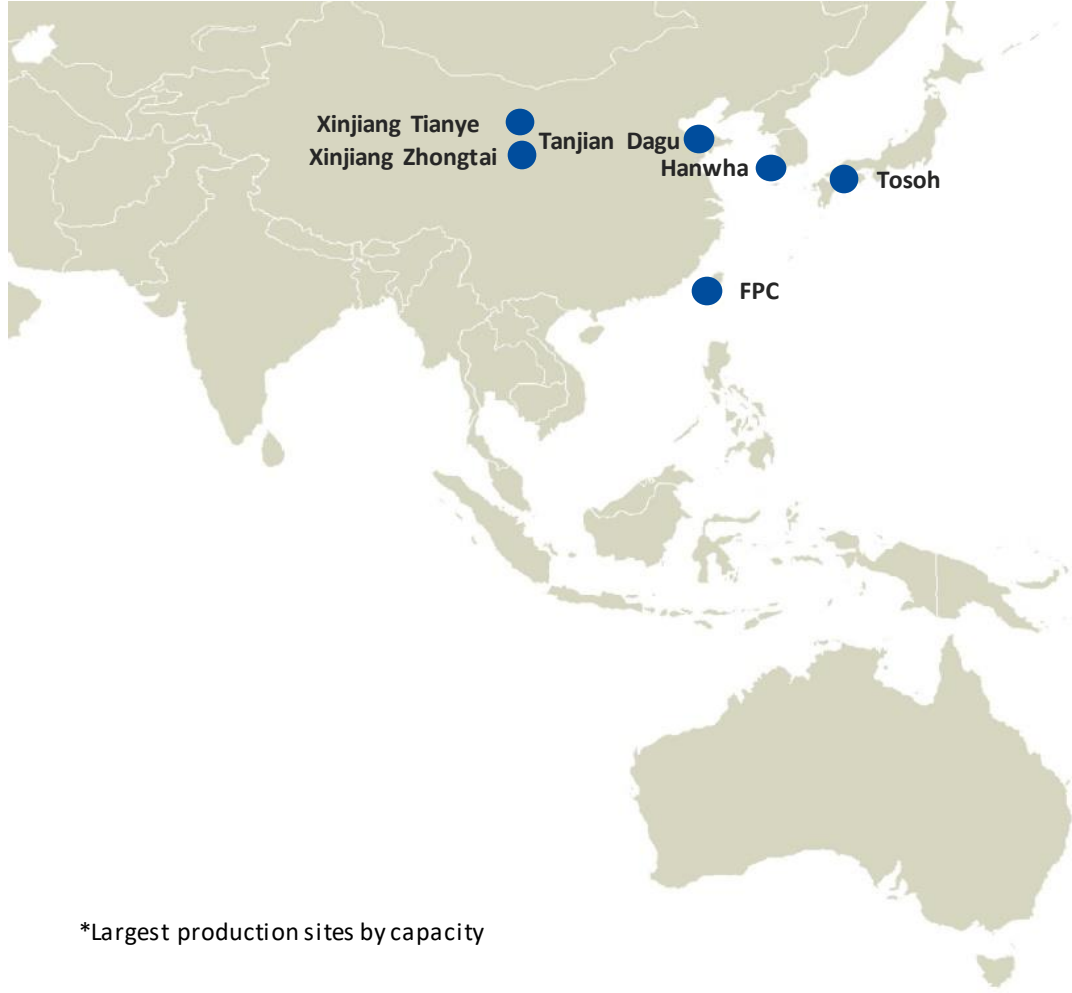


- Import interest is to pick up from September after the summer lull, but soft domestic demand may keep buying interest lower than usual. Current import prices in the mid to high \$800/dmt cfr mean that overseas imports may still only be feasible from few origins and the initial focus could be on local sources such as Egypt, Romania and France. Declining chlorine and caustic soda offtake have yet to visibly affect sellers' and buyers' approach to pricing and any price pressure in either direction has yet to emerge.



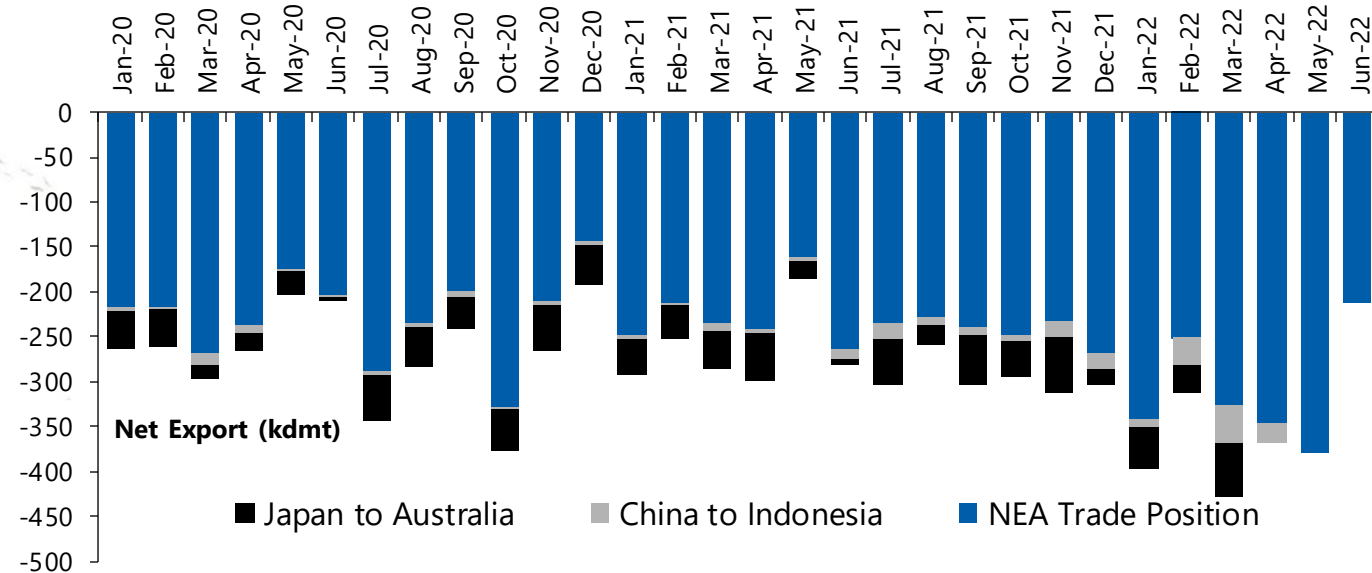
# Asia-Pacific trade analysis

## Northeast Asian producers to divert more caustic soda into export market



\*Largest production sites by capacity

- Northeast Asia maintains as the largest net exporting region of caustic soda, contributed primarily by Chinese facilities.
- China is expected to maintain net position as the largest caustic soda export due to low domestic parity price and weak domestic consumption.
- Other northeast Asian producers outside China offload more cargoes into export too as they maintain high run rates.
- Australia maintained its regular contractual import in near term with very little spot requirement.
- India continues to seek export opportunities.



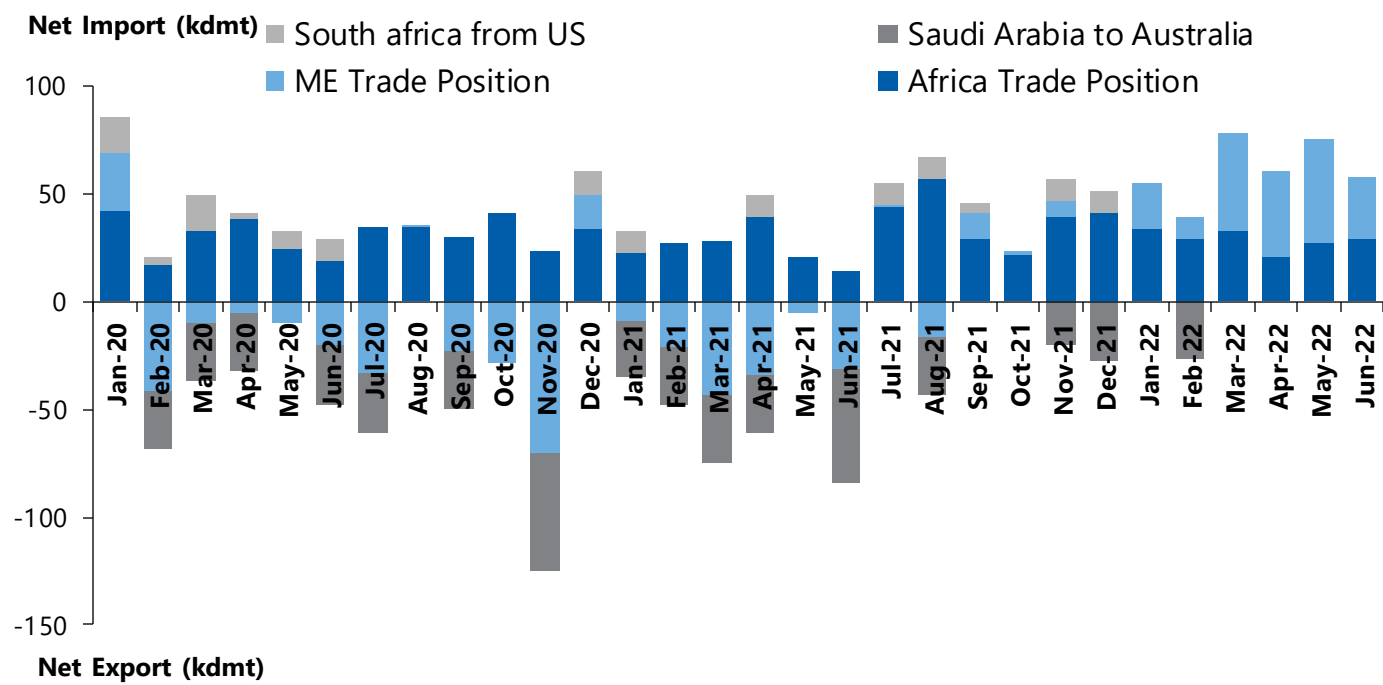
# Middle East Africa trade analysis

## Major export emerges in Saudi Arabia in Q4



\*Largest production sites by capacity

- Middle East will cease import of caustic soda from outside the region for its caustic soda consumption, especially on the alumina sector,
- It's likely from Q4 of 2022 when Sabic's newly converted membrane line is fully functional.
- Saudi Arabia will resume its position as a net exporter for caustic soda.



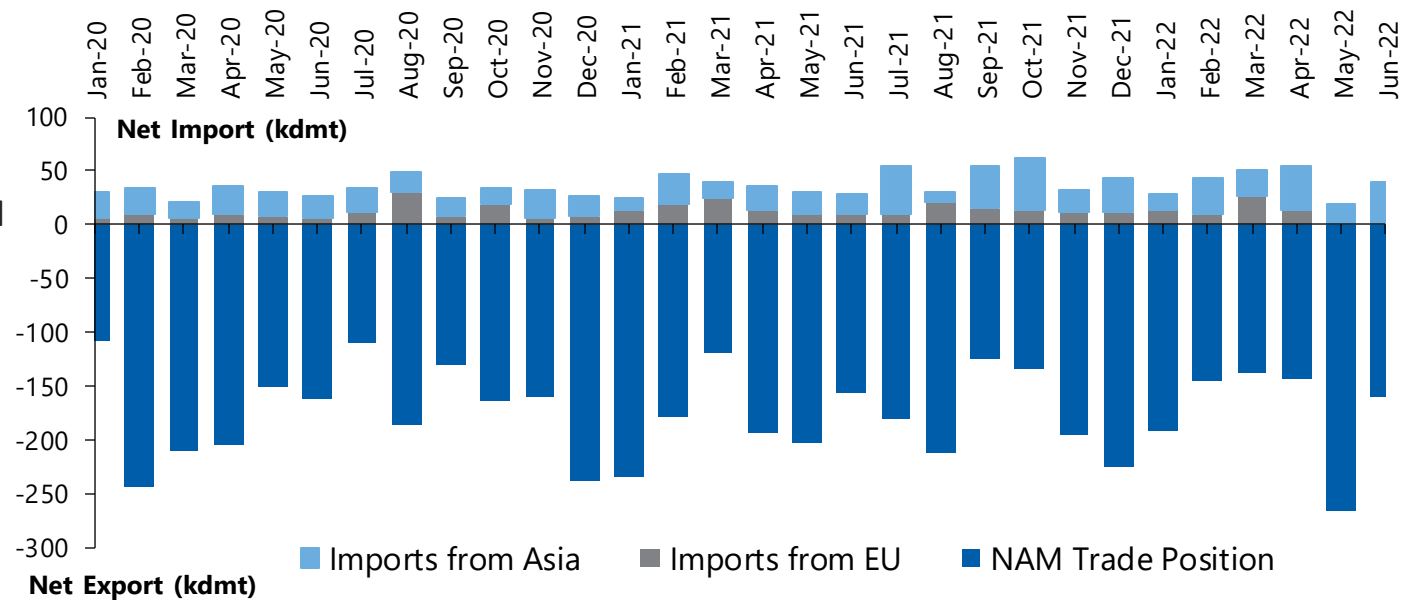
# North America trade analysis

## Slowing PVC production limits availability of export supply



\*Largest production sites by capacity

- Slowing PVC production is leading to an increase in EDC exports as producers focus on fulfilling contract obligations for caustic soda exports.
- Some export caustic soda demand has slowed into alumina as production cuts in Europe reduce exports from the US. This is anticipated to be offset over the winter months with increased exports of both EDC and caustic soda.
- Imports of caustic soda to the US east coast have been limited by export availability from Europe. Exports from Europe to the US east coast are expected to be minimal for the remainder of the year. Mexico as well as other regions have stepped up shipments.
- The completion of repairs at Plaquemine, Louisiana, should allow for increased exports of EDC and caustic soda over the next several months. This will be dependent upon European demand for these products as the Asia market for EDC is saturated.



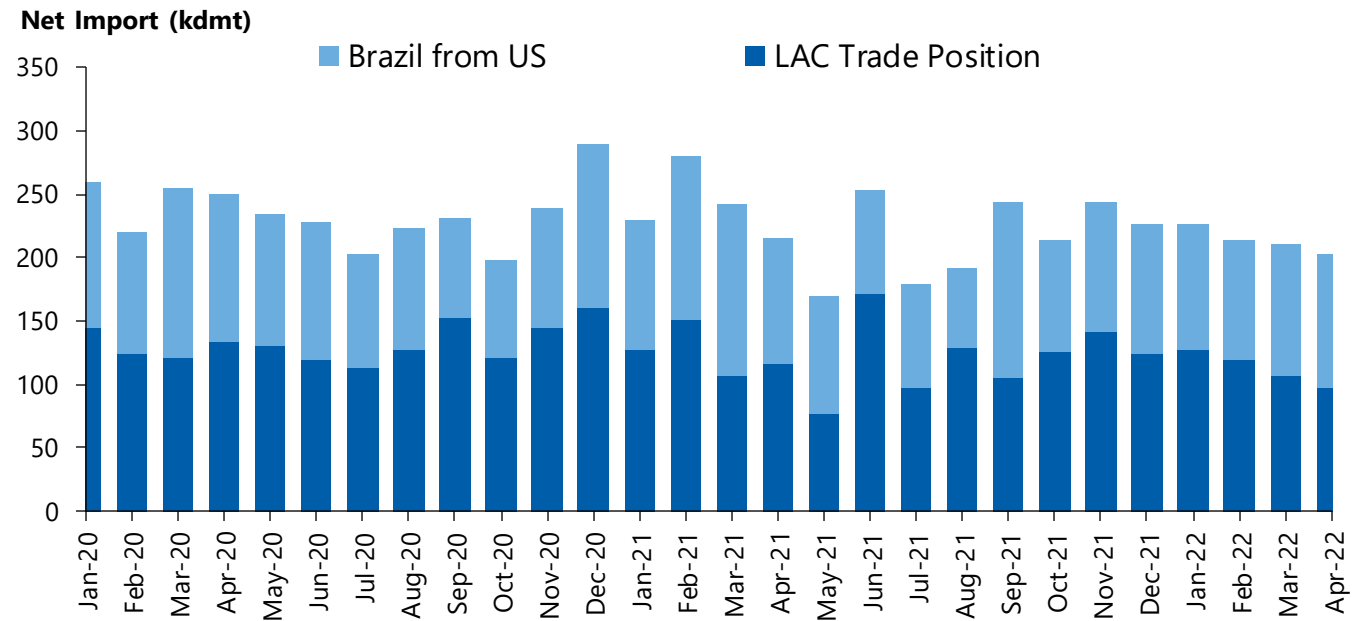
# Latin America trade analysis

## Inflation and slowing GDP growth impact caustic soda demand



\*Largest production sites by capacity

- Argentina is forecast to have an inflation rate of 71pc over the last 12 months and an economic contraction have reduced demand for both caustic soda and chlorine.
- Demand for caustic soda into pulp and paper remains at an elevated level as currency devaluation in the region is improving the competitiveness of some producers.
- Brazil has reduced import duties on PVC in an effort to stimulate demand, however demand is stagnant and there are hopes of a slow recover through the end of the year.
- Industrial applications for caustic soda have slowed across the region and are impacting demand.






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1	<a href="#"><u>Regional Sections – Americas, Europe, Asia-Pacific</u></a>
2	<a href="#"><u>ECU Analysis</u></a>
3	<a href="#"><u>Global Trade</u></a>
4	<a href="#"><u>Related Markets Insight</u></a>

# Chlor-Alkali related markets scorecard

## Impact on chlor-alkali markets

### Chlor-Alkali Derivatives

PVC		<ul style="list-style-type: none"><li>• PVC production cuts are becoming more widespread with more sellers adjusting output to weaker offtake. The industry has been busy destocking as selling prices have dropped and the demand outlook remains uncertain. Part of the recent demand decline has been seasonal, but indications that the challenging economic fundamentals are also playing a role are strong.</li></ul>
Alumina		<ul style="list-style-type: none"><li>• At least four European alumina producers have cut rates so far due to the high power costs. In Romania, Alum Tulcea have externalized their temporary shutdown to 17 months starting from August. In Spain, Alcoa has cut rates further to 50-60pc of capacity from August after initially reducing output by up to 15pc in July. In Germany, a smaller alumina producer is also understood to be cutting rates on cost pressures. Slovalco in Slovakia is to temporarily cease primary aluminium production at the end of September due to adverse conditions in the power market. The site had already been curtailed by 40pc since late 2021. Some of the largest and integrated European alumina producers are still running normally, and so any caustic soda demand impact is localised and is not driving fundamentals for Europe as a whole.</li><li>• One alumina producer in Jamaica is slow to ramp operating rates after being shutdown for an extended period of time.</li></ul>
EDC		<ul style="list-style-type: none"><li>• Global EDC demand continues to fall with PVC. Some EDC production assets that had been shutdown on the US Gulf coast are looking to ramp operating rates over the winter months as Europe focuses on imports instead of domestic production.</li><li>• EDC exports from the US Gulf coast have increased as vinyls producers look to exporting more EDC to meet caustic soda contractual demand</li><li>• EDC output in Europe lowers due to the weakening vinyls industry.</li><li>• Asia EDC operating rates are slowing with weaker PVC demand and higher imports from other regions.</li></ul>



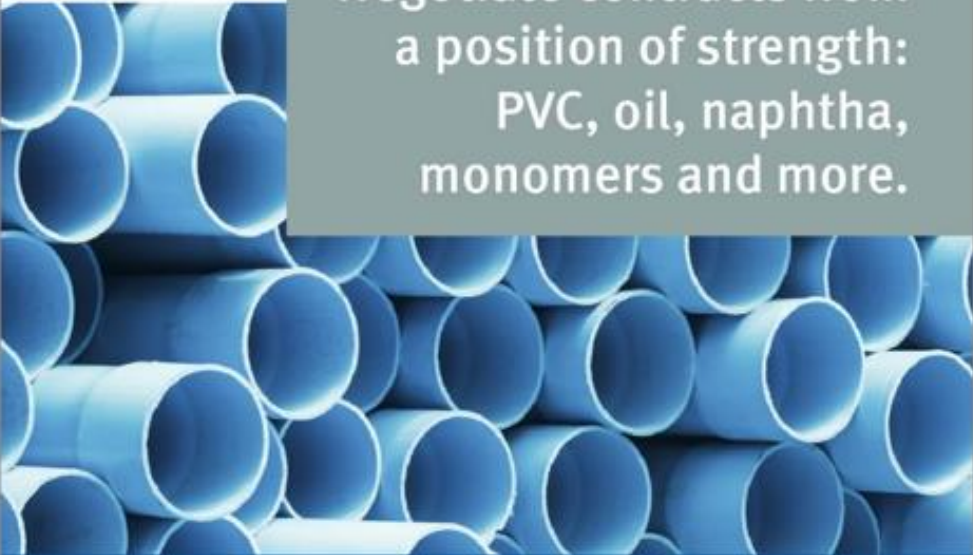
# Argus Chlor-Alkali and Derivatives



Spot and contract benchmarks  
with leading analysis for  
Americas, Europe and Asia  
Pacific: chlor-alkali, caustic  
soda, vinyls, chlorine.

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# Argus Chlor-Alkali Outlook

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