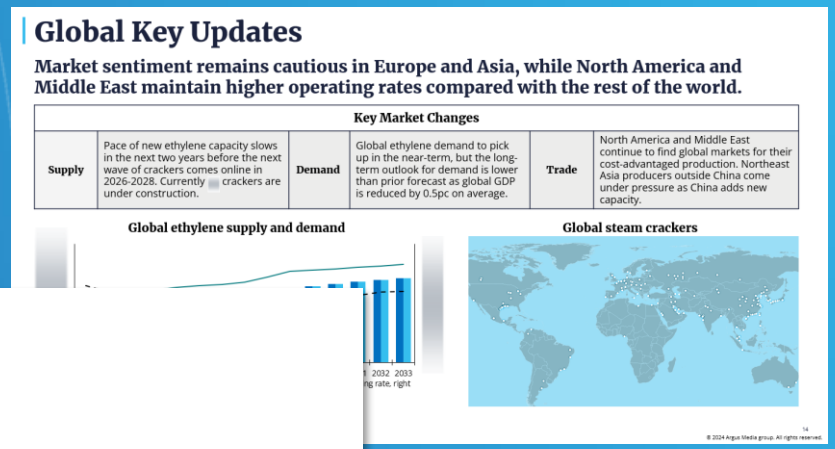
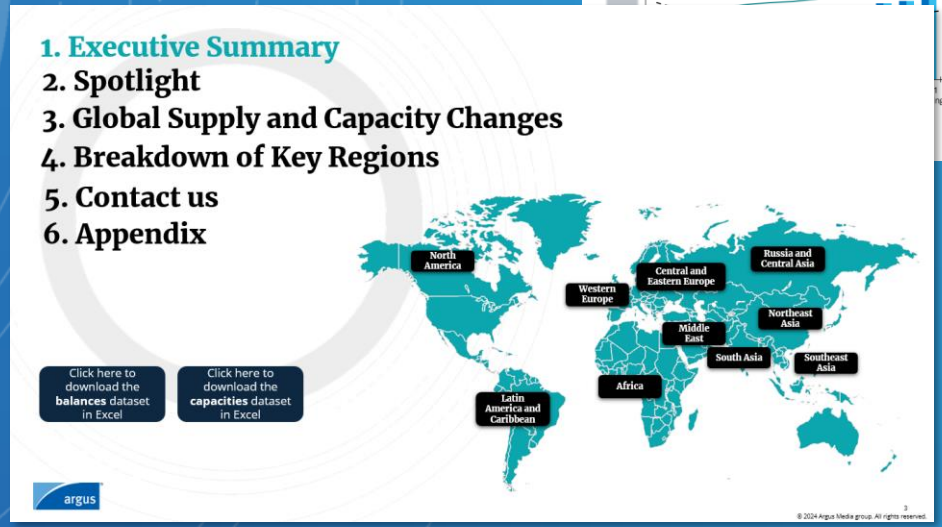
Argus report sample

Ethylene Analytics

19 April 2024





About this report

Argus Ethylene Analytics is a data-driven evaluation of supply-demand fundamentals forecasts for ethylene and derivative markets, published twice a year.

The service includes a 10-year forecast and five-year history covering balances and capacities, organized by country and region.

In this sample, we share insights from Northeast America and Northeast Asia.

Subscribers receive a PowerPoint PDF written by our experts plus the accompanying Excel data files.

To find out more, **click here to get in touch**.

argus

Key features

10-year forecast and a five-year history
Covering capacities, supply and demand, trade, and feedstock forecasts for leading derivatives, by country and region, published twice a year.

Detailed report
In an easy-to-read PowerPoint format focusing on new plant capacities, growth rates in relevant markets, and regulatory developments.

Regional insight
Covering capacities and operating rates based on global trade and economics.

Downloadable datasets
With data on supply, demand, capacities, operating rates and trade balances, by country and region.

Access to specialists
Speak to the experts behind Argus' long-term analytics forecast services.

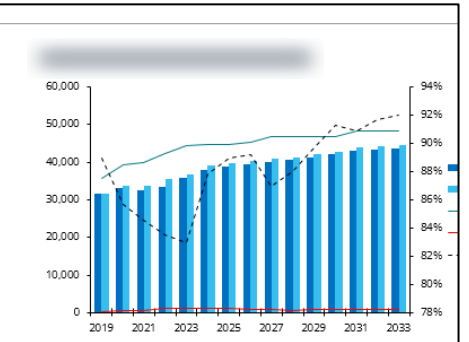
Associated data

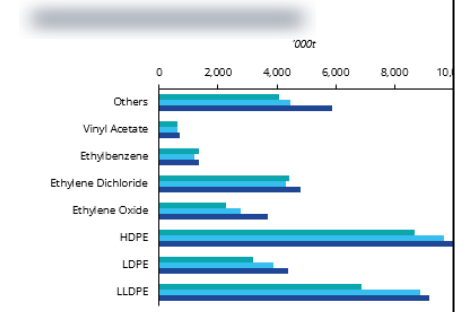
Feedstock flexibility by steam cracker; global supply, demand and trade by country

Ethylene steam cracker by feedstock flexibility, 2023

Region	Country	Company	Location	Capacity '000t	Capacity mn lb	Technology	Ethane Min	Ethane Max	Propane Min	Propane Max	Butane Min	Butane Max	Naphtha Min	Naphtha Max	Gas Oil Min	Gas Oil Max
Africa	Egypt	Ethydco	Alexandria	460	1,014	Lummus	100	100								
Africa	Egypt	Sidi Kerir Petrochemicals	Alexandria	300	661	Lummus/Crest	100	100								
Africa	Libya	Rasco	Ras Lanuf	330	727	S&W							100	100		
Africa	Nigeria	Indorama Eleme Petrochemicals	Port Harcourt	440	970	Kellogg		50		50		50		100		
Australasia	Australia	Qenos	Altona	105	231	S&W	90	90					10	10		
Australasia	Australia	Qenos	Botany	300	661	Linde	100	100								
Central and Eastern Europe	Belarus	Polymir	Novopolotsk	60	132								100	100		
Central and Eastern Europe	Belarus	Polymir	Novopolotsk	120	265			5		5		30	70	100		
Central and Eastern Europe	Czech Republic	Orlen Unipetrol														
Central and Eastern Europe	Hungary	MOL Petrochemicals														
Central and Eastern Europe	Hungary	MOL Petrochemicals														
Central and Eastern Europe	Poland	PKN Orlen														
Central and Eastern Europe	Poland	PKN Orlen														
Central and Eastern Europe	Serbia	HIP Petrohemija														
Central and Eastern Europe	Slovakia	Slovnaft														
Central and Eastern Europe	Ukraine	Karpatneftekhim														
Latin America and Caribbean	Argentina	Pampa Energia														
Latin America and Caribbean	Argentina	PBBPolisur														
Latin America and Caribbean	Argentina	PBBPolisur														
Latin America and Caribbean	Brazil	Braskem														
Latin America and Caribbean	Brazil	Braskem														
Latin America and Caribbean	Brazil	Braskem														
Latin America and Caribbean	Brazil	Braskem														
Latin America and Caribbean	Brazil	Braskem														
Latin America and Caribbean	Brazil	Braskem														
Latin America and Caribbean	Colombia	Ecopetrol														
Latin America and Caribbean	Venezuela	Pequiven														
Latin America and Caribbean	Venezuela	Pequiven														
Middle East	Iran	Abadan Petrochemicals														
Middle East	Iran	Amir Kabir Petrochemicals														
Middle East	Iran	Arak Petrochemicals														
Middle East	Iran	Arya Sasol Polymer														
Middle East	Iran	Bandar Imam Petrochemical														

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2019-2023	2023-2028	2028-2033
Capacity																		
Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Ethanol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Methanol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Molasses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Refinery	271	271	271	271	271	271	271	271	271	271	271	271	271	271	271	0.0%	0.0%	0.0%
Steam cracker	35,299	39,106	39,691	42,116	44,116	44,409	44,536	45,056	46,616	46,616	46,616	46,616	46,616	46,616	46,616	5.7%	1.1%	0.0%
Speculative Capacity	-	-	-	-	-	-	-	-	-	-	-	-	1,300	1,300	1,400			
Total capacity	**35,570**	**39,377**	**39,962**	**42,387**	**44,387**	**44,680**	**44,807**	**45,327**	**46,887**	**46,887**	**46,887**	**46,887**	**48,187**	**48,187**	**48,287**	**5.7%**	**1.1%**	**0.6%**
Production																		
Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Ethanol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Methanol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Molasses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Refinery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Steam cracker	31,626	33,723	33,782	35,402	36,815	39,226	39,859	40,418	40,768	41,249	42,034	42,789	43,774	44,168	44,430	3.9%	2.3%	1.5%
Total production	**31,626**	**33,723**	**33,782**	**35,402**	**36,815**	**39,226**	**39,859**	**40,418**	**40,768**	**41,249**	**42,034**	**42,789**	**43,774**	**44,168**	**44,430**	**3.9%**	**2.3%**	**1.5%**
Operating Rate	89%	86%	85%	84%	83%	88%	89%	89%	87%	88%	90%	91%	91%	92%	92%			
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Total supply	**31,626**	**33,723**	**33,782**	**35,402**	**36,815**	**39,226**	**39,859**	**40,418**	**40,768**	**41,249**	**42,034**	**42,789**	**43,774**	**44,168**	**44,430**	**3.9%**	**2.3%**	**1.5%**
Derivative Capacity (Ethylene)																		
Acetaldehyde	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	0.0%	0.0%	0.0%
Alpha Olefins	2,756	3,227	3,322	3,322	3,529	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	6.4%	2.5%	0.0%
Speculative Alpha Olefins	-	-	-	-	-	-	55	55	220	220	330	594	891	891	891			
E/P Rubber	692	666	647	647	647	647	647	647	647	647	647	647	647	647	647	-1.7%	0.0%	0.0%
Ethanol	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	0.0%	0.0%	0.0%
Ethyl Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%
Ethyl Chloride	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	0.0%	0.0%	0.0%
Ethylbenzene	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	0.0%	0.0%	0.0%
Speculative Ethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Ethylene Dichloride	5,521	5,521	5,470	5,503	5,532	5,532	5,799	5,920	5,920	5,920	5,920	5,920	5,920	5,920	5,920	0.1%	1.4%	0.0%
Speculative Ethylene Dichloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Ethylene Oxide	2,949	3,630	4,078	4,799	4,823	4,823	4,823	4,823	4,823	4,823	4,823	4,823	4,823	4,823	4,823	13.1%	0.0%	0.0%
Speculative Ethylene Oxide	-	-	-	-	-	-	-	-	-	312	848	992	992	992	992			
HDPE	7,538	7,795	7,841	7,841	8,047	8,820	8,923	9,438	10,983	10,983	10,983	10,983	10,983	10,983	10,983	1.6%	6.4%	0.0%
Speculative HDPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
LDPE	3,904	4,019	4,748	4,748	4,748	4,748	4,748	4,748	4,748	4,748	4,748	4,748	4,748	4,748	4,748	5.0%	0.0%	0.0%
Speculative LDPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
LLD-HDPE	9,140	10,081	10,291	11,348	11,848	12,494	12,494	12,494	12,494	12,494	12,494	12,494	12,494	12,494	12,494	6.7%	1.1%	0.0%
Speculative LLD-HDPE	-	-	-	-	-	-	-	-	-	-	-	-	195	195	195			
Linear Alcohols	423	518	593	593	593	593	593	593	593	593	593	593	593	593	593	8.8%	0.0%	0.0%





US ethylene demand, 2023

US ethyle

Contents | World | Regional dashboard | Country dashboard | GDP | Trade | Capacity

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Associated data, continued

Ethylene and first-line derivative capacities

2023 Ethylene company balances, '000t					Capacity to consume ethylene										
Region	Country	Company	Location	Ethylene Capacity	ACE	AOL	EB	EDC	EO	EPR	ETH	HDPE	LDPE	LLD-HDPE	VAM	Other
North America	Canada	Alberta & Orient Glycol	Prentiss						216							
North America	Canada	Celanese	Edmonton										173			
North America	Canada	Dow	Fort Saskatchewan	1,430										712		
North America	Canada	Dow	Prentiss											809		
North America	Canada	Dow, Nova	Joffre	1,542												
North America	Canada	Imperial Oil	Sarnia	300										488		
North America	Canada	INEOS	Joffre			321										
North America	Canada	INEOS Styrolution	Sarnia				140									
North America	Canada	MEGlobal	Fort Saskatchewan													
North America	Canada	MEGlobal	Prentiss													
North America	Canada	Nova Chemicals	Sarnia	1,145												
North America	Canada	Nova Chemicals	Joffre	1,542												
North America	Canada	Nova Chemicals	Mooretown													
North America	Canada	Shell Chemicals	Scotford													
North America	Canada	Shell Chemicals	Fort Saskatchewan													
North America	Mexico	Braskem Idesa	Nanchital de Lazaro C	1,000												
North America	Mexico	Pemex	La Cangrejera	600												
North America	Mexico	Pemex	Morelos	600												
North America	US	Americas Styrenics	Donaldsonville													
North America	US	Arcanum	Baytown													
North America	US	Axiall	Lake Charles													
North America	US	BASF	Geismar													
North America	US	BASF TotalEnergies	Port Arthur	1,140												
North America	US	Bayport Polymers	Port Arthur	750												
North America	US	Bayport Polymers	Bayport													
North America	US	Braskem	La Porte													
North America	US	Celanese	Bay City													
North America	US	Celanese	Clear Lake Shores													
North America	US	Chevron Phillips Chemical	Port Arthur	807												
North America	US	Chevron Phillips Chemical	Sweeny	1,373												
North America	US	Chevron Phillips Chemical	Cedar Bayou	2,596												
North America	US	Chevron Phillips Chemical	Pasadena													

Capacity list for ethylene and its first-line derivatives, '000t

Product	Region	Country	Operating Company	Location	Country Subdivision	Source	2019	2020	2021	2022	2023	20
Ethylene	Western Europe	France	A.P. Feyzin	Feyzin	Auvergne-Rhône-Alpes	Steam Cracker	245	245	245	245	245	24
Ethylene	Middle East	Iran	Abadan Petrochemicals	Abadan	Khūzestān	Steam Cracker	48	48	48	48	48	48
Ethylene Dichloride	Middle East	Iran	Abadan Petrochemicals	Abadan	Khūzestān		60	60	60	60	60	60
Ethylene Dichloride	Middle East	Iran	Abadan Petrochemicals	Abadan	Khūzestān		64	64	64	64	64	64
Ethylbenzene	Northeast Asia	China	Abel Chemical	Taixing	Jiangsu		281	281	281	281	281	28
Ethylene Dichloride	Middle East	Saudi Arabia	Al Waha Petrochemicals	Al Jubayl	Ash Sharqīyah		300	300	300	300	300	30
Ethylene Oxide	North America	Canada	Alberta & Orient Glycol	Prentiss	Alberta		270	270	270	270	270	27
Ethylbenzene	North America	US	Americas Styrenics	Donaldsonville	Louisiana		545	545	545	545	545	54
Ethylbenzene	North America	US	Americas Styrenics	Donaldsonville	Louisiana		600	600	600	600	600	60
Alpha Olefins	Middle East	Iran	Amir Kabir Petrochemicals	Bandar-e Emam Khomeyni	Khūzestān	Raffinate	20	20	20	20	20	20
Ethylene	Middle East	Iran	Amir Kabir Petrochemicals	Bandar-e Emam Khomeyni	Khūzestān	Steam Cracker	520	520	520	520	520	52
HDPE	Middle East	Iran	Amir Kabir Petrochemicals	Bandar-e Emam Khomeyni	Khūzestān		140	140	140	140	140	140
LDPE	Middle East	Iran	Amir Kabir Petrochemicals	Bandar-e Emam Khomeyni	Khūzestān		300	300	300	300	300	30
LLD-HDPE	Middle East	Iran	Amir Kabir Petrochemicals	Bandar-e Emam Khomeyni	Khūzestān		300	300	300	300	300	30
Alpha Olefins	Russia and Central Asia	Russia	Amur GCC	Svobodnyy	Amurskaja oblast'							
Ethylene	Russia and Central Asia	Russia	Amur GCC	Svobodnyy	Amurskaja oblast'	Steam Cracker						
HDPE	Russia and Central Asia	Russia	Amur GCC	Svobodnyy	Amurskaja oblast'							
LLD-HDPE	Russia and Central Asia	Russia	Amur GCC	Svobodnyy	Amurskaja oblast'							
Ethylbenzene	Russia and Central Asia	Russia	Angarsk PCC	Angarsk	Irkutskaja oblast'		48	48	48	48	48	48
Ethylene	Russia and Central Asia	Russia	Angarsk PCC	Angarsk	Irkutskaja oblast'	Steam Cracker	300	300	300	300	300	30
Ethylbenzene	Northeast Asia	China	Anhui Haoyuan Chemical	Fuyang	Anhui		281	281	281	281	281	28
Ethylene Oxide	Northeast Asia	China	Anhui Haoyuan Chemical	Fuyang	Anhui		60	60	60	60	60	60
Ethylbenzene	Northeast Asia	China	Anhui Jiaxi New Material	Fuyang	Anhui				347	378	378	37
Ethylene Dichloride	Central and Eastern Europe	Poland	Anwil	Wloclawek	Kujawsko-pomorskie		365	365	365	365	365	36
Ethylene Dichloride	Central and Eastern Europe	Poland	Anwil	Wloclawek	Kujawsko-pomorskie		385	385	385	385	385	40
Alpha Olefins	Middle East	Iran	Arak Petrochemicals	Arak	Markazī	Raffinate	7	7	7	7	7	7
Ethylene	Middle East	Iran	Arak Petrochemicals	Arak	Markazī	Steam Cracker	306	306	306	306	306	30
Ethylene Oxide	Middle East	Iran	Arak Petrochemicals	Arak	Markazī		110	110	110	110	110	110
HDPE	Middle East	Iran	Arak Petrochemicals	Arak	Markazī		85	85	85	85	85	85
LLD-HDPE	Middle East	Iran	Arak Petrochemicals	Arak	Markazī		75	75	75	75	75	75
Vinyl Acetate Monomer	Middle East	Iran	Arak Petrochemicals	Arak	Markazī		30	30	30	30	30	30
Alpha Olefins	North America	US	Arcanum	Baytown	Texas		12	100	100	100	100	100
LDPE	Western Europe	France	Arkema	Balan	Grand-Est		70	70	70	70	70	70

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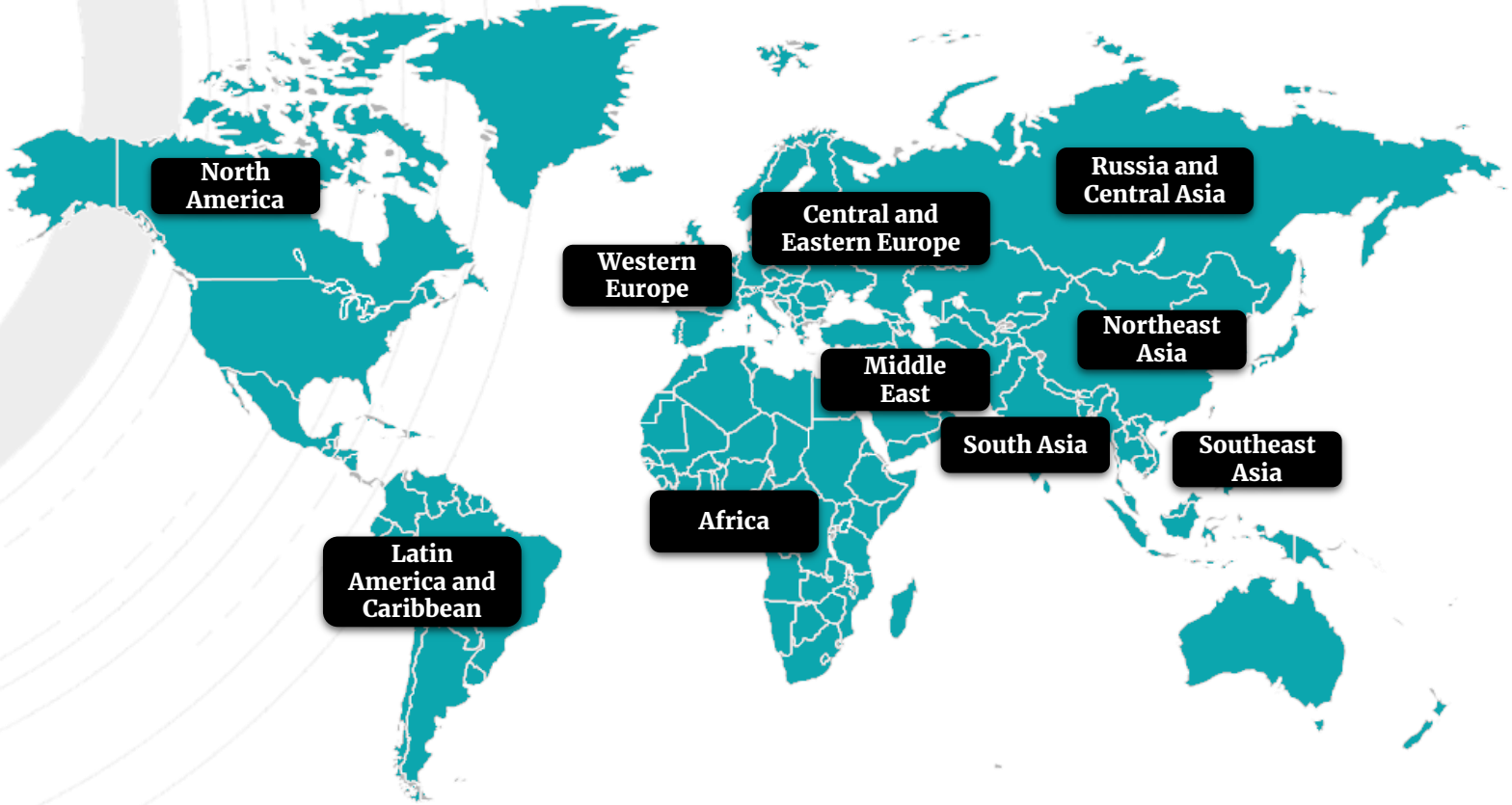


Ethylene Analytics Executive Summary

April 2024 update of 10-year global ethylene supply, demand and trade analysis.

Northeast Asia

Annual demand growth will slow to 4pc by the end of the decade. A new wave of cracker expansions, [illegible]mn t, will improve China self-sufficiency. Most of this new capacity will come online in 2026-2028.

Western Europe

Demand bottomed out in 2023 with slow recovery forecast through 2024/25. Plant closures multiply as companies face the pressure of carbon reduction and imports.

North America

Producers retain their cost advantage over other regions except the Middle East. The pace of new cracker expansions slows. Exports of polyethylene, ethylene glycol and ethylene continue to grow.

Middle East

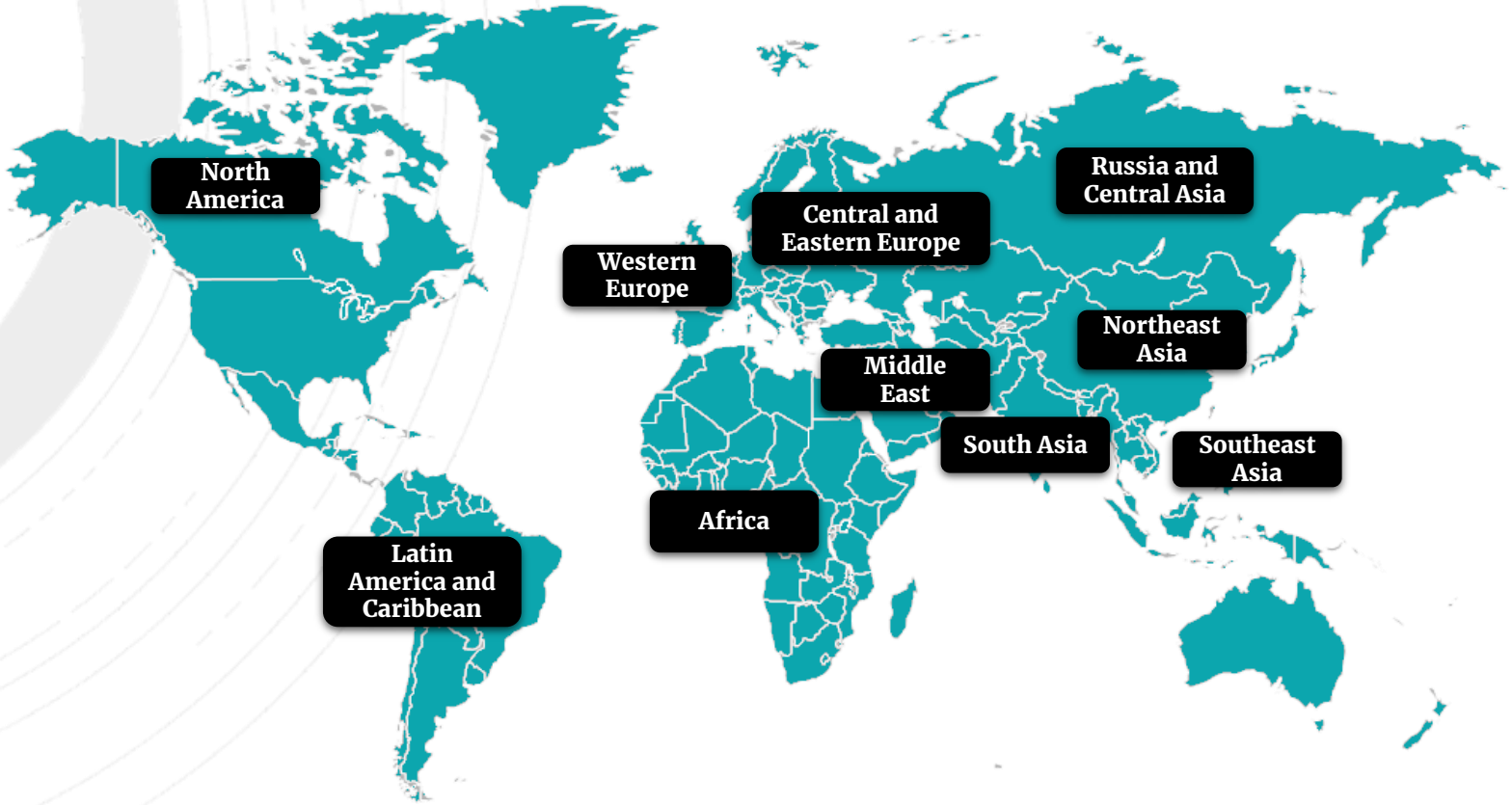
The region will add [illegible] of new ethylene capacity by 2028. More LPG, naphtha and refinery dry gas will be used as feedstock, signaling a change in strategy for Middle East producers. Crude-to-chemicals and refinery integration become a focus for region's oil producing nations.

South Asia (India)

Steam crackers to lead way in ethylene production; an anticipated [illegible] of new capacity will be required to meet demand growth by the end of the forecast period.

Southeast Asia

Operating rates will stay low with new cracker projects coming online, requiring more time to recover due to limited feedstock flexibility in cracking. Ethylene and derivative export volumes to shrink with northeast Asia improving self-sufficiency, limiting export opportunities.



Spotlight: US ethane supply

Is there enough US ethane to support a second wave of low-cost crackers? How will planned exports impact the US ethane supply and demand balance?

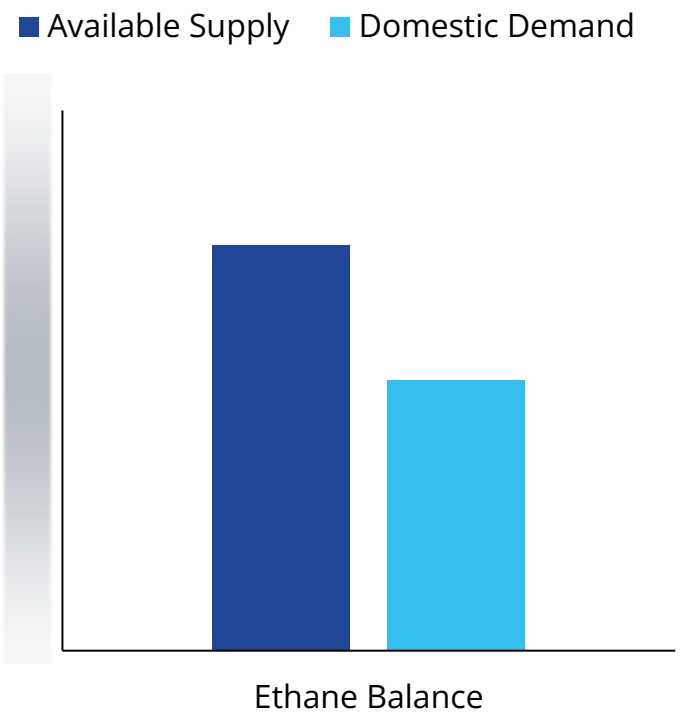
Today, US ethane is a “distressed” product, produced from associated gas production and therefore priced closely to natural gas. There is sufficient ethane supply to support current and announced crackers in the long term.

However, a large second wave of cost-advantaged ethane crackers is unlikely unless oil price and domestic oil production exceed today's levels.

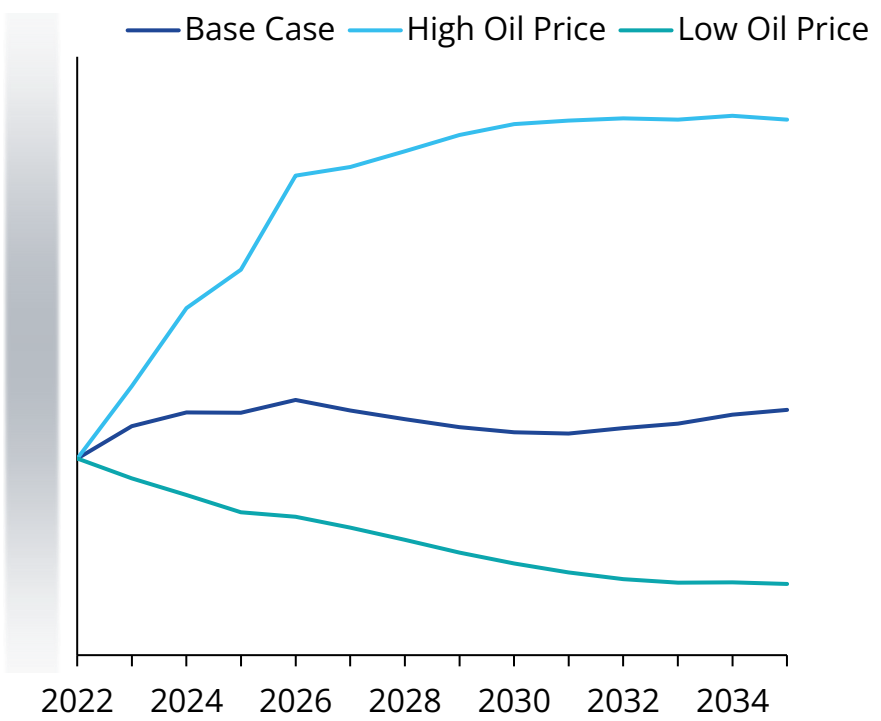
New ethane export facilities will narrow the gap between supply and demand by 2030. Mexico, Europe, China and India will increase ethane imports.

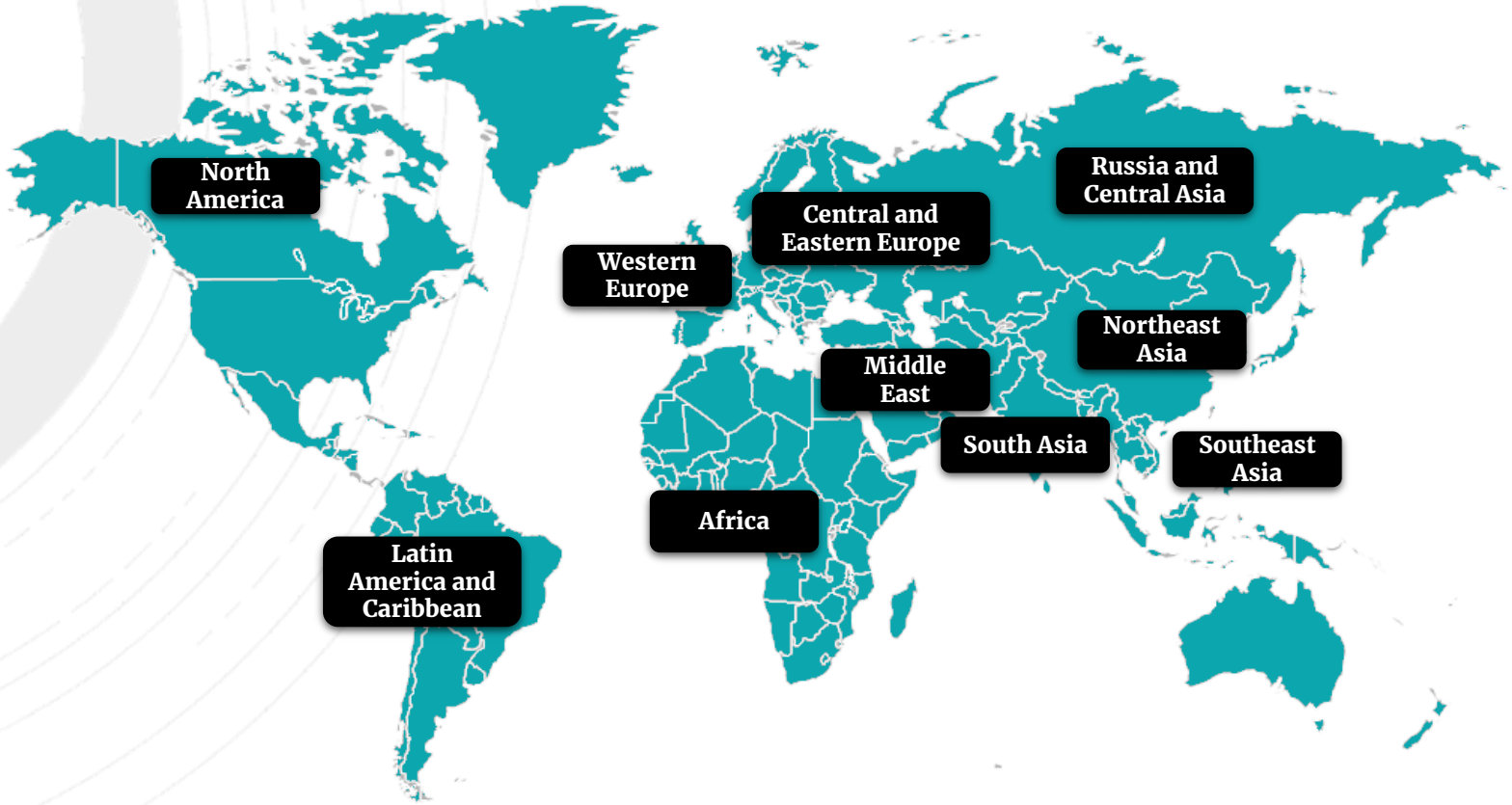
Ethane prices will move higher on a tighter supply and demand balance and higher natural gas prices.

Current US ethane production



US natural gas liquid production outlook



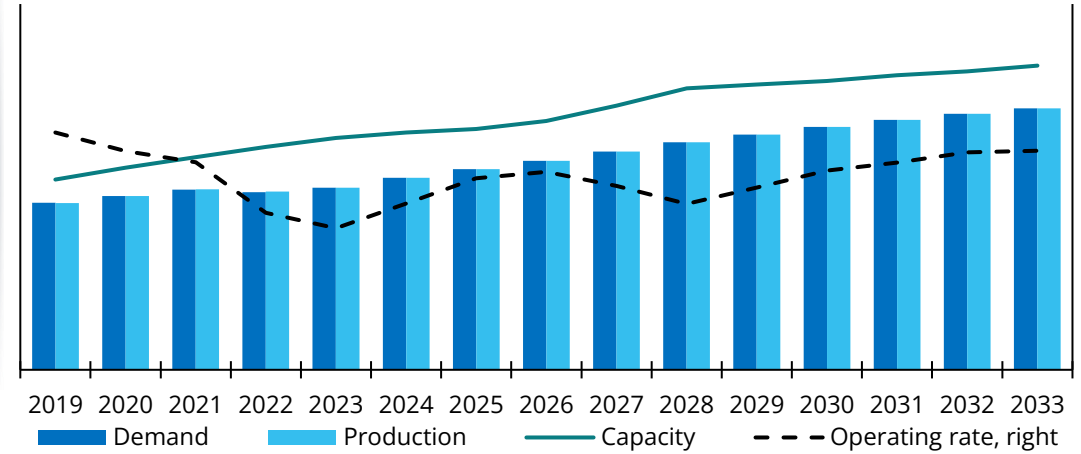


Global Key Updates

Market sentiment remains cautious in Europe and Asia, while North America and Middle East maintain higher operating rates compared with the rest of the world.

Key Market Changes					
Supply	Pace of new ethylene capacity slows in the next two years before the next wave of crackers comes online in 2026-2028. Currently [redacted] crackers are under construction.	**Demand**	Global ethylene demand to pick up in the near-term, but the long-term outlook for demand is lower than prior forecast as global GDP is reduced by 0.5pc on average.	**Trade**	North America and Middle East continue to find global markets for their cost-advantaged production. Northeast Asia producers outside China come under pressure as China adds new capacity.

Global ethylene supply and demand



Global steam crackers

Global: Economy

Central banks appear to have tamed inflation for now. Global GDP forecast continues to be revised lower for longer as growth in China continues to be revised lower.

GDP Forecast Assumptions

Inflation

Inflation to be more volatile than before the pandemic. Central banks likely to keep inflation close to target in the medium and long term.

Monetary Policy

Central banks to cut rates this year. They will move cautiously to bring rates down slowly.

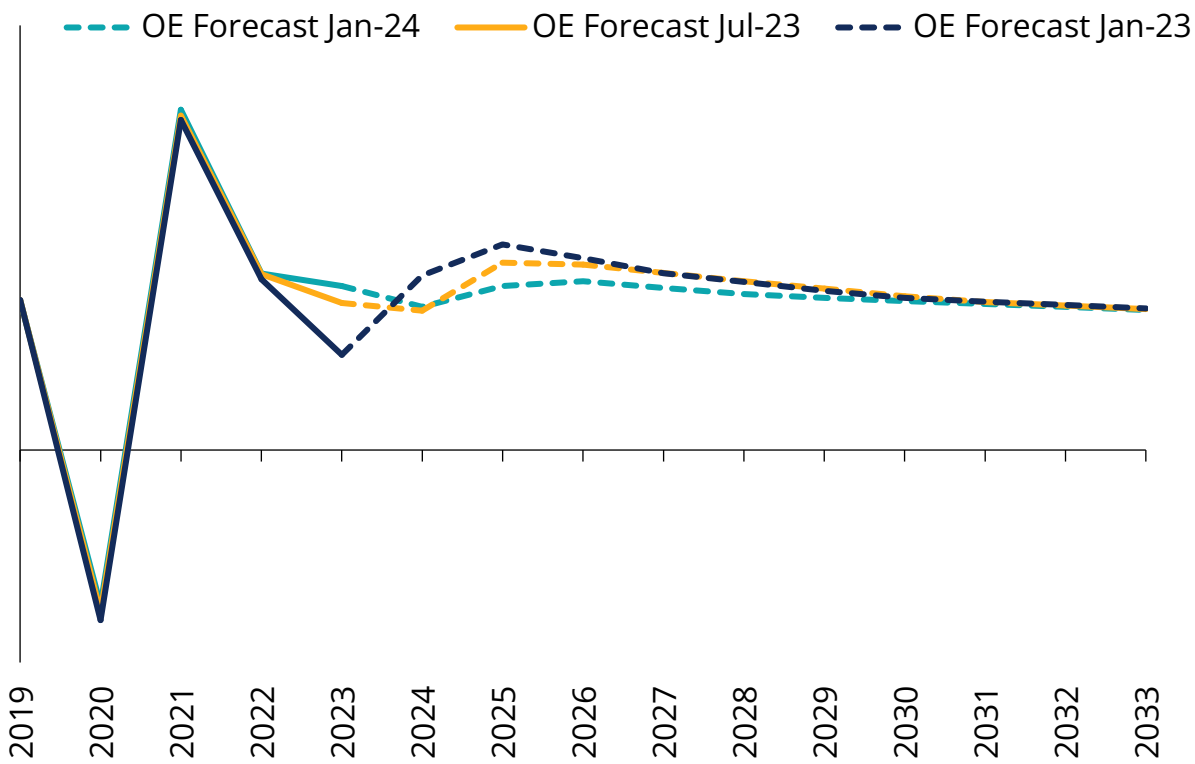
War in Ukraine

Russia sanctions stay in place long after any cease-fire. Europe avoids any future energy problems during winter months.

Globalisation

No meaningful change in the global trading system or US/China relationship. Recent tariffs and other trade barriers stay in place.

Global GDP growth rate forecast, Oxford Economics (OE)



Source: Oxford Economics

Global: Supply

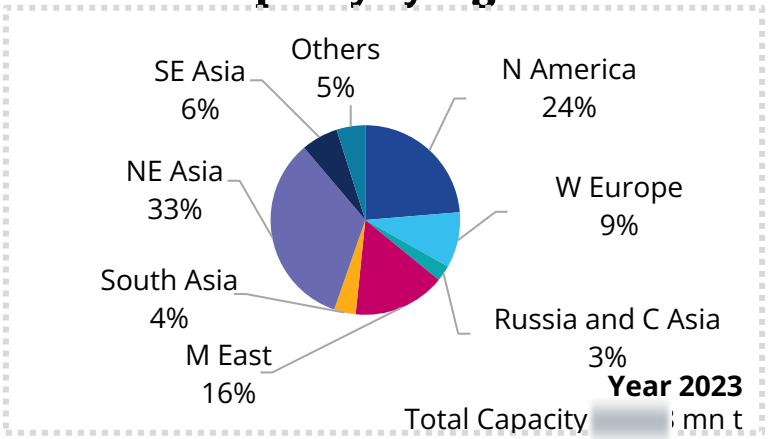
Global operating rates reached a bottom last year. Capacity additions to slow over the next two years. Next wave of large capacity expansion to take place in 2026-2028.

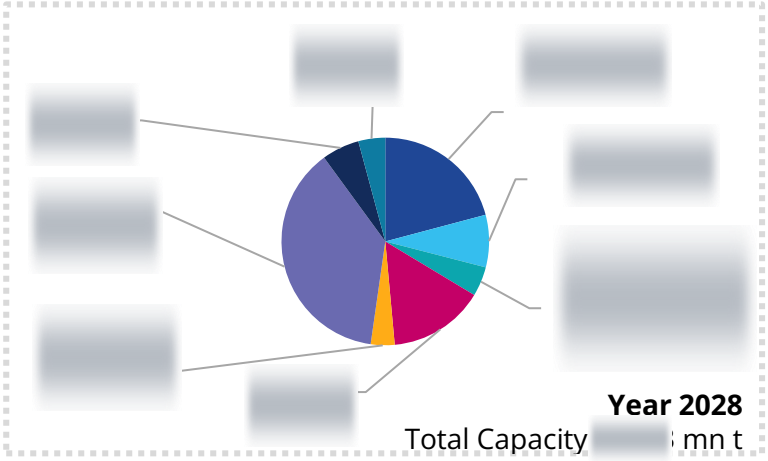
There are currently [redacted] crackers under construction. These new crackers will add [redacted] of new global capacity, coming online mostly in 2026-2028.

Every major region will expand capacity during the forecast period, but China will lead the way, adding [redacted] of new capacity.

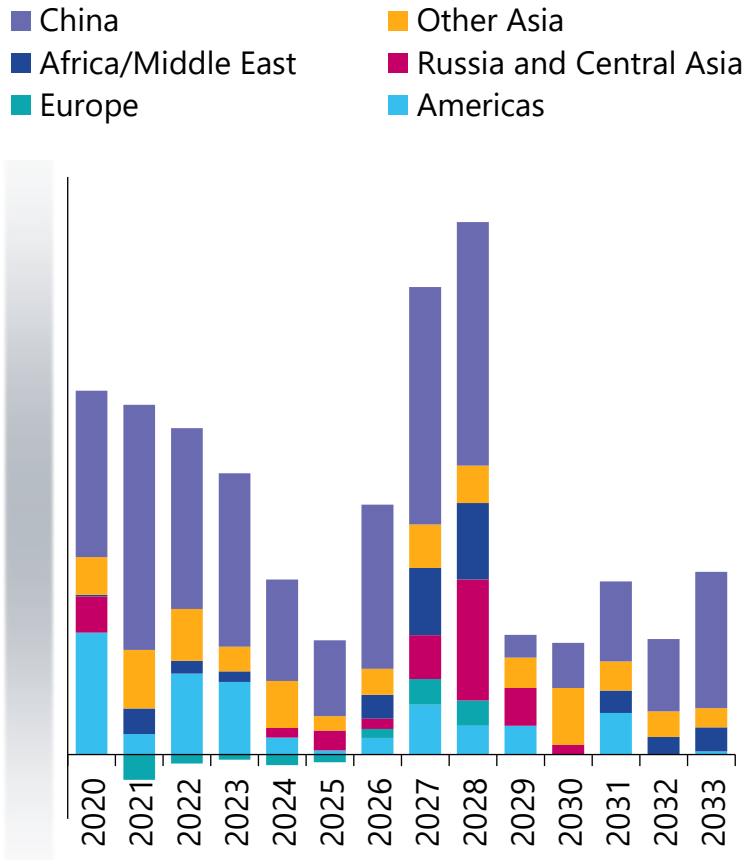
Most of the planned crackers will use naphtha as their primary feedstock. Only [redacted] of the new capacity will come from ethane-only crackers.

Capacity by region





Capacity year-on-year changes



Global: Demand

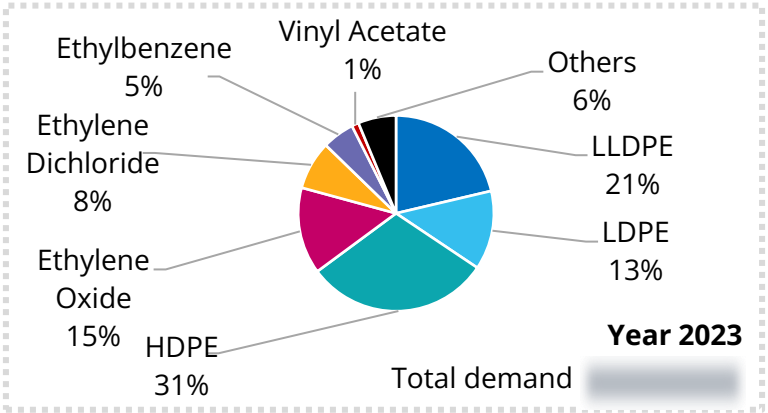
Macroeconomic drivers of ethylene demand remain in place: Growing middle class, urbanization and now the material transition to a lower carbon world.

The average annual global GDP forecast for 2023-2028 has been lowered by 0.5pc versus the Argus 2023 spring update. Despite the lower GDP forecast, the fundamental drivers for ethylene demand remain in place and will continue to drive ethylene demand growth.

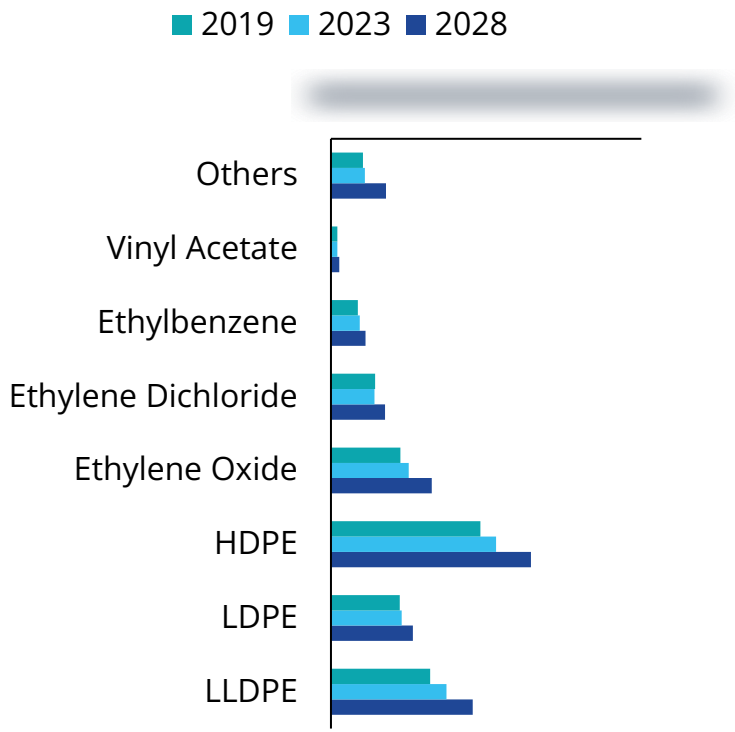
China, India, and other developing economies will outpace other regions in ethylene demand growth. For the 2023-2028 period, China's ethylene demand is forecasted to grow at a CAGR of [redacted]. This is [redacted] lower versus the prior five-year period. On the other hand, India's demand will grow at a CAGR of [redacted]. This is a significant increase from the prior five-year period when India's ethylene demand only grew at a CAGR of [redacted].

Polyethylene and ethylene glycol will lead demand growth. These products are supported by growing end-use markets like plastic packaging and polyester fibers.

Demand by derivative



Demand by derivative

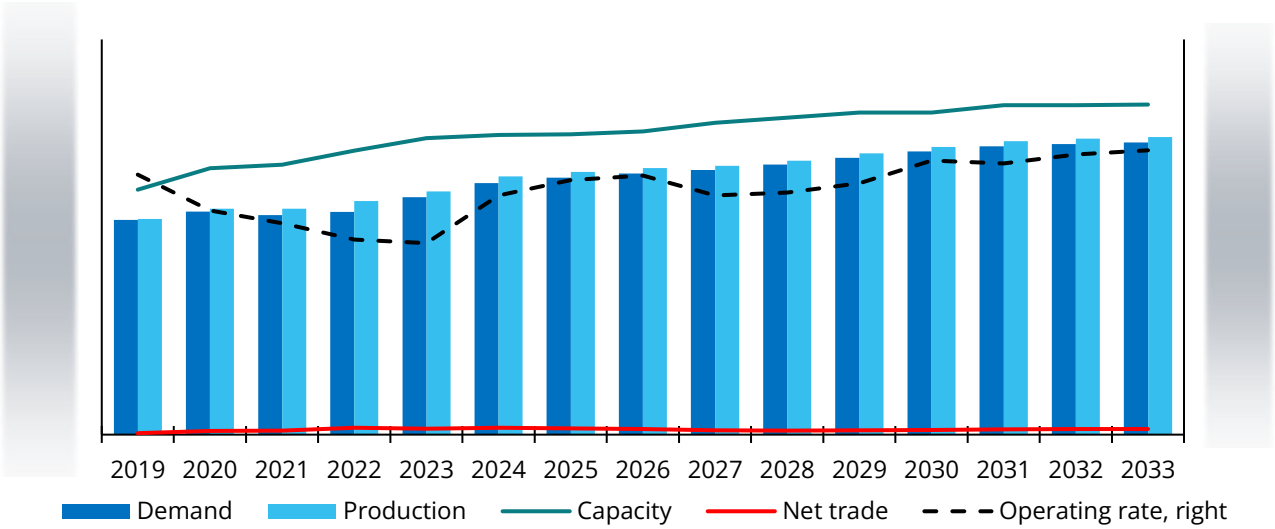


North America: Key Updates

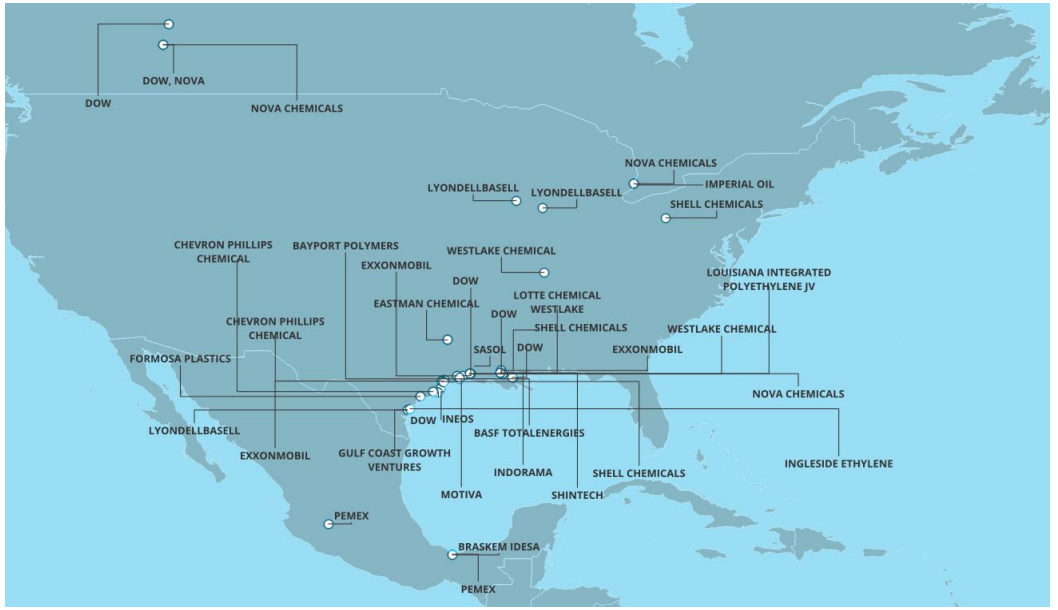
North American producers retain their cost advantage over other regions expect the Middle East. Exports of polyethylene, ethylene glycol and ethylene continue to grow.

Key Market Changes					
Supply	New supply capacity slows as producers absorb the [redacted]: of capacity added since 2015.	**Demand**	North America is now very dependent on export demand for most derivatives. Over 50pc of North American PE production is expected to be exported in 2024.	**Trade**	North America's ethylene export position is expected to grow as new export capacity is added in 2025.

North America ethylene supply and demand



North America steam crackers



North America: Supply

Pace of new ethylene capacity slows, but growth will likely come from the integration of existing ethylene supply into derivatives later this decade.

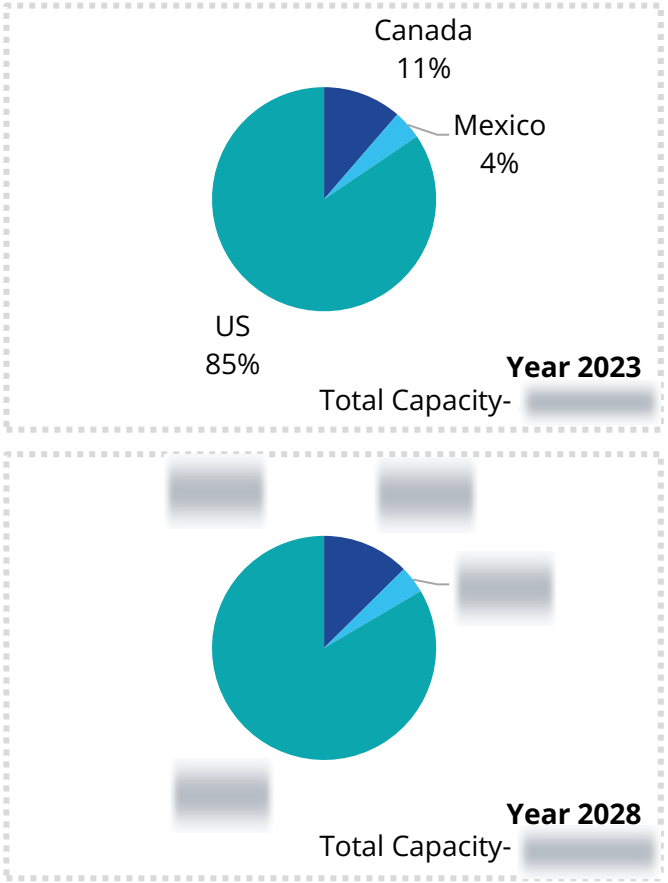
The pace of significant capacity additions for the region will be significantly slower than the prior seven years. Only two producers — a CPChem/Qatar joint venture and Dow Chemical — are moving forward with expansion projects during the forecast period.

At least two other expansion projects are under development, but the timing of final investment decisions is unclear. Likely reasons for the delays are higher capital cost and the uncertainty of attractive export markets, especially for PVC producers.

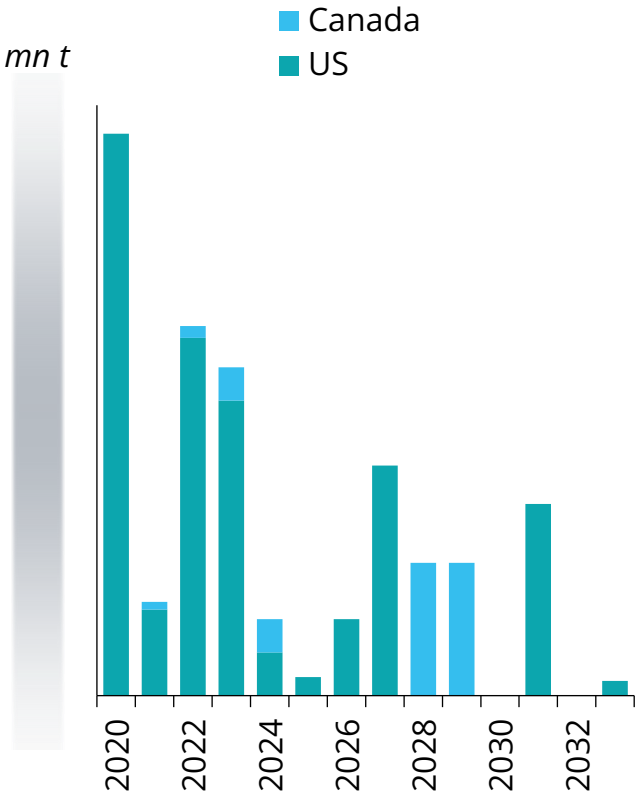
We have reduced the amount of speculative capacity for later this decade. Capacities for Dow Canada, Shell Chemicals in Monaca US and the CP Chem/Qatar joint venture have been updated based on project timelines. Total capacity has been revised up by [redacted] in 2027-28 but falls by [redacted] in 2029-32.

By 2031, high operating rates and a sustained ethane cost advantage will likely lead to at least one additional cracker project. Over time, new projects will need to closely evaluate future ethane prices as exports continue to grow and the region's supply and demand for ethane narrows.

Capacity by country



Capacity year-on-year changes

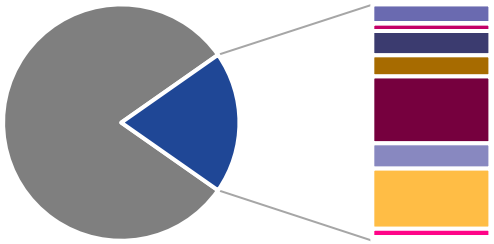


North America: Demand

Despite lower global demand growth, the region's ethylene cost advantage will enable producers to capture sufficient demand in the export market.

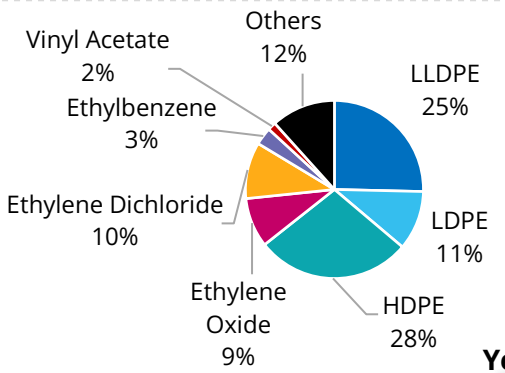
North America Ethylene Demand 2023

- Alpha Olefins 8%
- Ethanol 0%
- Ethylbenzene 3%
- Ethylene Dichloride 10%
- Ethylene Oxide 9%
- HDPE 28%
- LDPE 11%
- LLDPE 25%
- Other - Ethylene 4%



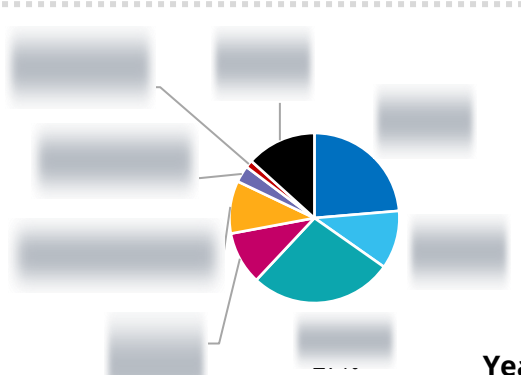
Global demand [redacted] mn t

Demand by derivative



Year 2023

Total demand = [redacted]



Year 2028

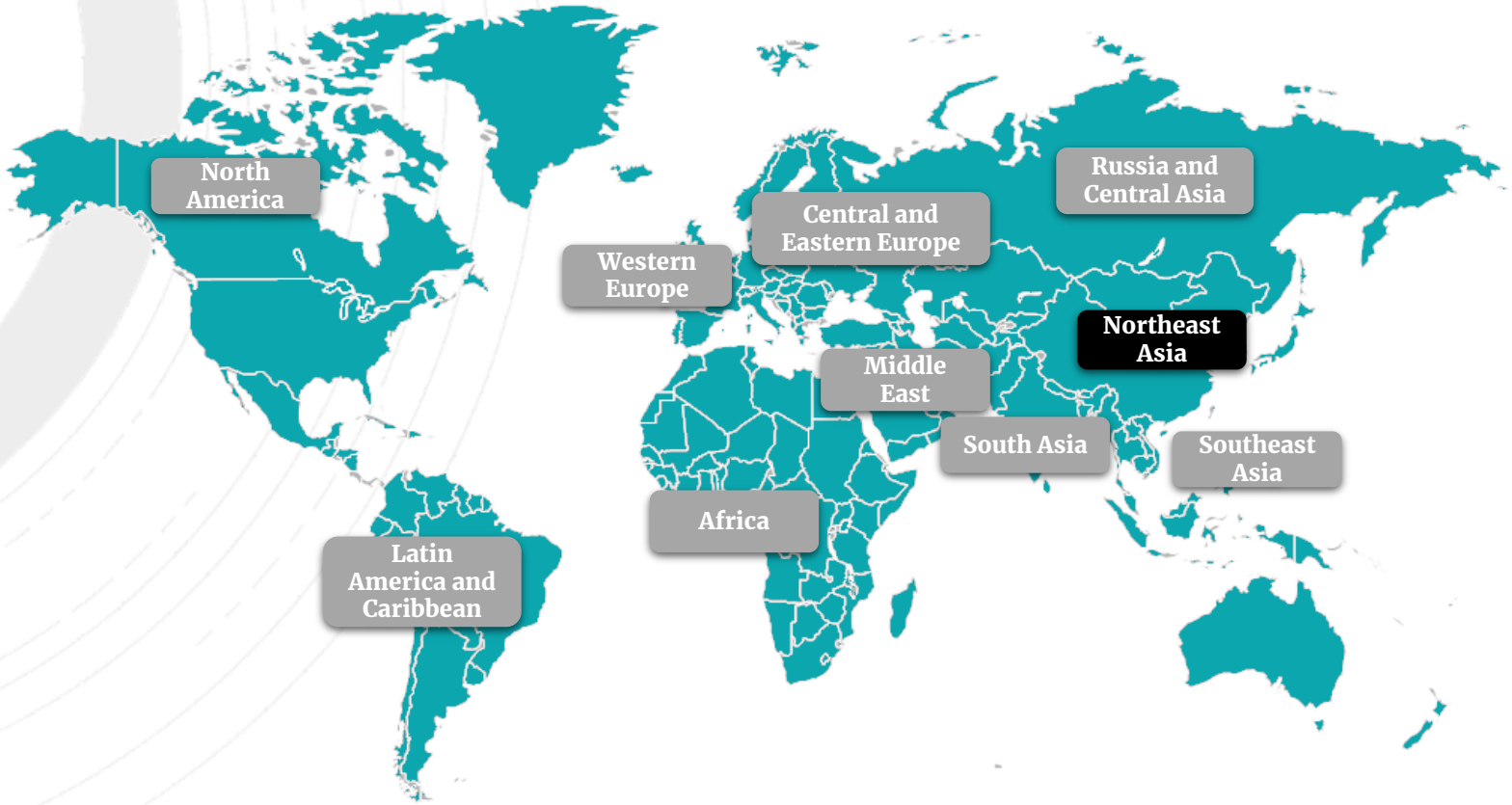
Total demand = [redacted]

North America's growing dependence on export markets will be an important demand driver going forward for polyethylene and ethylene glycol producers. Despite China's continued investments to reach self-sufficiency in polyethylene, there will be enough growth to support imports over the forecast period, though at a lower percentage of China's total polyethylene demand.

Despite the advantages of low energy prices and ethylene costs, regional PVC producers will continue to face competition from Chinese producers in global exports markets.

In the current forecast, we assume North America ethane-based production will retain its low-cost position versus naphtha-fed crackers in other regions. As US ethane exports grow, the region's ethane supply and demand balance will tighten, but not enough to change the relative advantage of North American derivative exports.

While not in the current balance, there is some upside demand for ethylene as producers look to capitalize on the region's availability of low-cost ethylene. Likely areas of interest will be in the production of on- [redacted] Also, there are recent reports of new VLGC's under construction that will be capable of transporting NGL's and ethylene on the same vessel. This will lower the freight for US ethylene exports. Combined with new ethylene export capacity, the region could see higher ethylene exports later this decade.

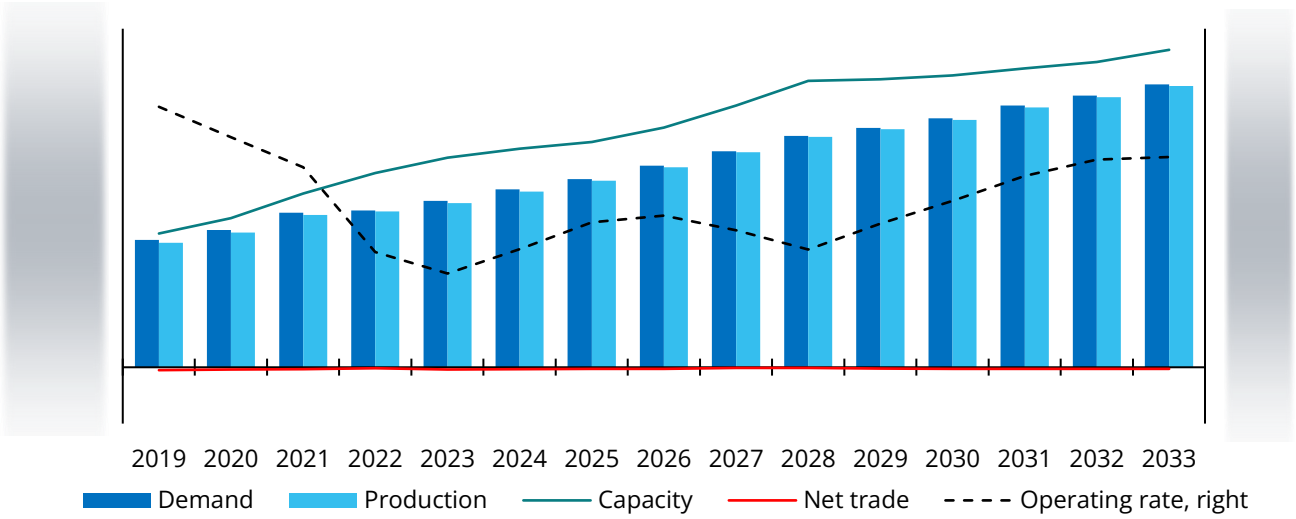


Northeast Asia: Key Updates

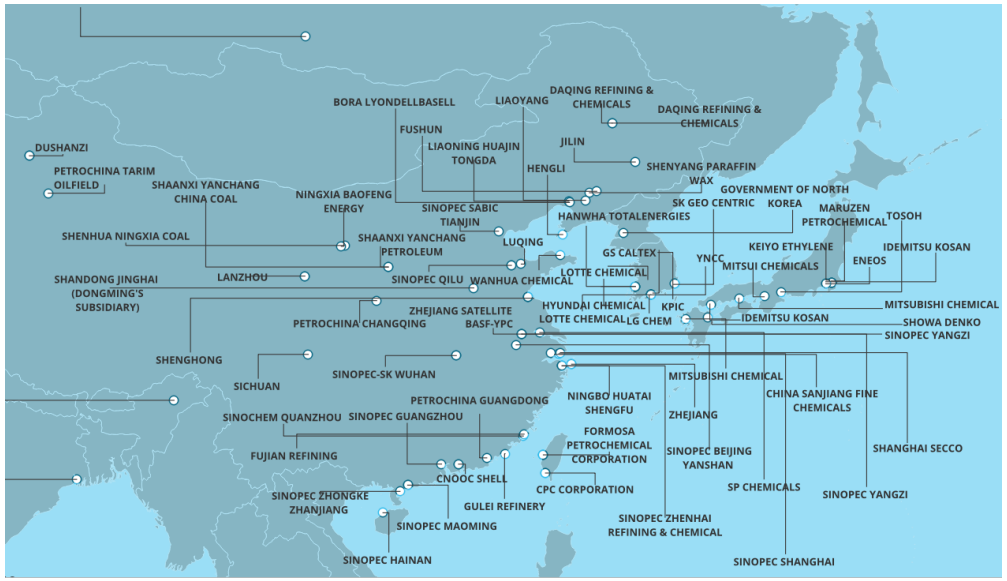
Regional demand growth will slow along with GDP. A new wave of cracker expansions in 2026-2028 will improve self-sufficiency in China.

Key Market Changes					
Supply	While cracker expansions slow in 2024-2025, a new wave of investment will lead to another expansion peak in 2026-2028, making the region the largest producer after North America.	**Demand**	Demand recovery remains slower than expected as the region struggles with contracting investment in real estate and shrinking domestic consumption due to aging populations.	**Trade**	Intra-regional trade will shrink further with capacity expansion in China. Ethylene downstream imports are expected to persist from the US and ME owing to cost advantages.

Northeast Asia ethylene supply and demand



Northeast Asia steam crackers



Northeast Asia: Supply

China and South Korea continue to pursue mega projects, which will weigh on operating rates and exacerbate oversupply locally and globally.

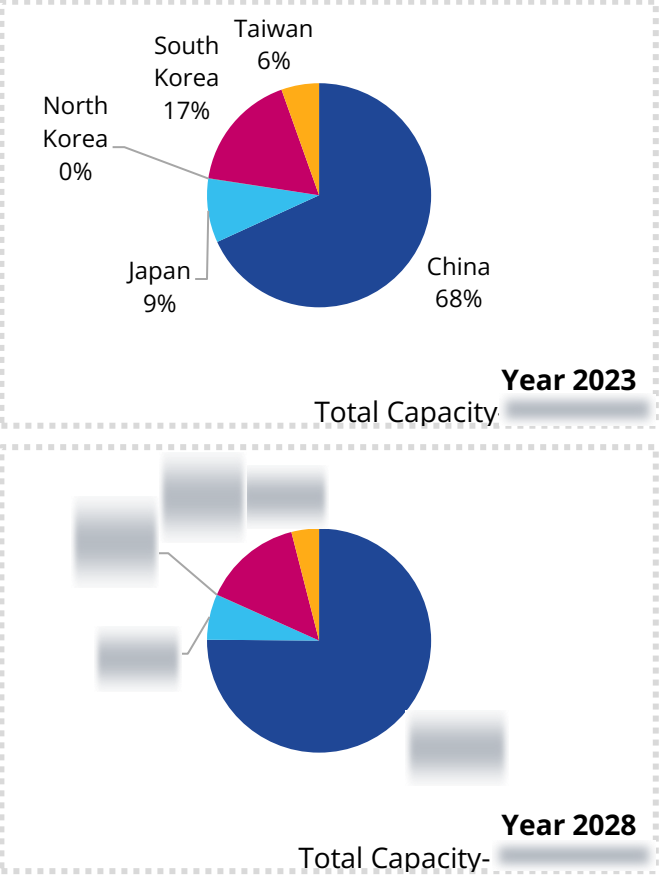
Cracker projects for 2022-23 mostly started as planned or were slightly delayed by a few months due to Covid-19 restrictions in the interim. Capacity growth is expected to slow through 2025 before rising again with mega projects coming online in 2026-2028. These include Yulongdao's second

looking to add a mega 1.8mn t/yr crude-based cracker project (S-Oil / Aramco's Shaheen Project) in 2027. *Argus* expects the region's total ethylene capacity to reach by 2033, almost double the capacity in North America.

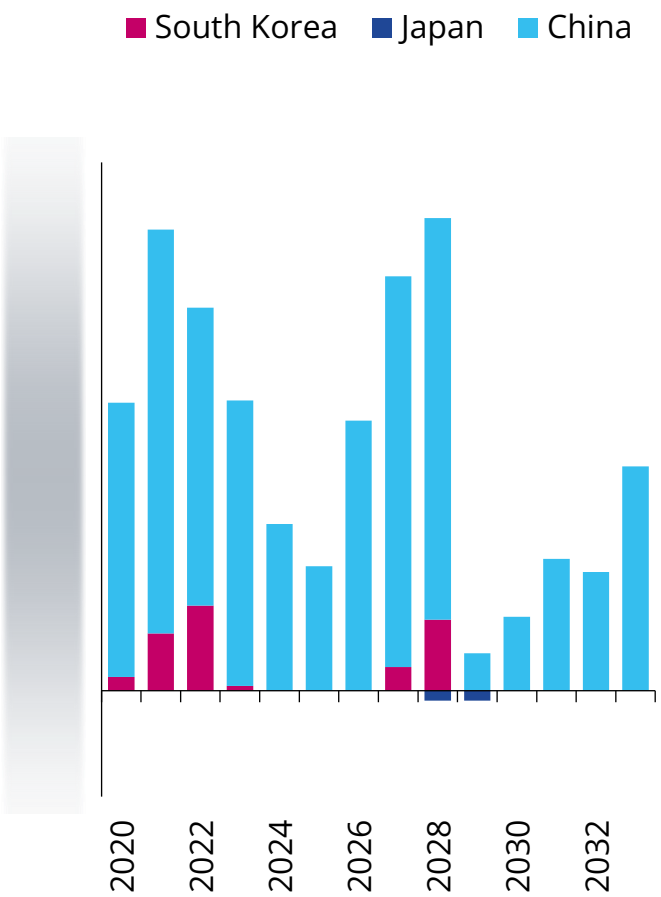
Production was adjusted downward by 523kt in 2022 but revised upwards in 2023 by 274kt compared to Argus's previous forecast, driven by lower demand growth and reduced operating rates due to negative production margins. Average production was reduced by 1.07mnt throughout the forecast in comparison to the previous iteration factoring in a longer-term demand recession expectation and potential rationalization and restructuring.

Argus forecasts operating rates to return to in 2025 amid slower expansions after bottoming out at in 2023. Massive expansions will then weigh on operating rates back to in 2028. The overall run rate through 2028 will remain lower than pre-Covid levels. Production margins are likely to stay negative for an extended period due to overcapacity as well as weak economic outlook globally.

Capacity by country



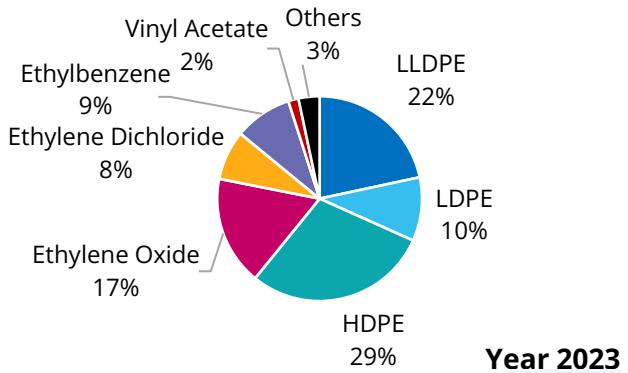
Capacity year-on-year changes



Northeast Asia: Demand

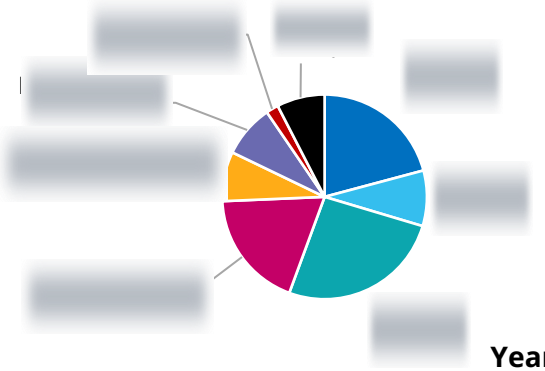
Demand growth of PE and EB are expected to slow down, while EDC, VAM and alpha olefins demand are expected to grow faster amid new capacities with better margins.

Demand by derivative



Year 2023

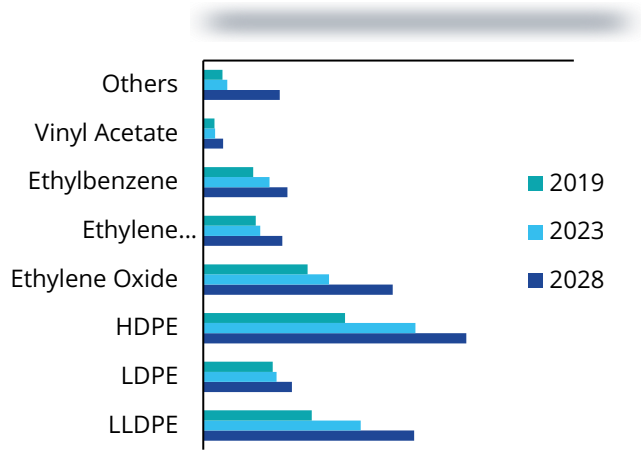
Total demand = [redacted]



Year 2028

Total demand = [redacted]

Demand by derivative



Northeast Asia Derivative Demand Growth pc

	CAGR 2019-23	CAGR 2023-28
Others	5.8%	
Vinyl Acetate	0.9%	
Ethylbenzene	7.3%	
Ethylene Dichloride	2.2%	
Ethylene Oxide	4.8%	
HDPE	10.6%	
LDPE	1.3%	
LLDPE	9.8%	
Total CAGR	**6.9%**	

The region's total domestic ethylene demand reached [redacted] in 2023, up by [redacted] year-on-year, versus [redacted] in 2022. Downstream demand recovered gradually over 2023 as China's reopening policy boosted domestic and trading activities. Argus forecasts demand to reach [redacted] by 2033.

Demand growth in PE, ethylene oxide, and ethylbenzene are expected to slow in 2022-27 owing to a weaker GDP outlook. Argus forecasts the market share of PE to shrink to [redacted] as EO and EVA increase.

Ethylene Dichloride (EDC) is one of the fastest growing segments over 2023-28 with CAGR soaring to [redacted] High margins in EDC-VCM-PVC value chain in 2021 spurred a wave of investment.

Vinyl acetate (VAM) is another promising downstream segment. which is expected to grow at CAGR of [redacted] n 2023-28 from [redacted] in 2019-23, driven by strong demand for EVA, especially in photovoltaic applications.

There is also strong investment interest in alpha olefin, polyolefin elastomer, and ultra-high molecular weight polyethylene sectors in China as producers try to explore new market niches.

We hope you found this sample report for Argus Ethylene Analytics valuable.

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