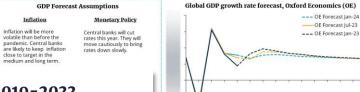
Argus report sample

Butadiene Analytics

July 2024

Global: Economy

Central banks appear to have tamed inflation for now. The global GDP forecast continues to be revised lower for longer as China's growth lags.



World butadiene industry overview, 2019-2033

Asia-Pacific will remain the production and demand center.

 China remains the leader for both BD production and consumption. Its ability to lift domestic consumption, find derivative export outlets and gain market share will sway global demand.

· Europe is in a delicate place as the industry undergoes strategic business reviews of assets.

• The US is on the cusp of becoming more balanced as imports slide during the last half of the forecast period.





About this report

Argus Butadiene is a data-driven evaluation of supply-demand fundamentals forecasts for butadiene 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 an overview of the global Butadiene industry as well as insights from North America.

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

To find out more, <u>click here to get in touch</u>.





Key features







10-year forecast and a five-year history Features capacities, supply and demand and trade 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 global trade flow. **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' longterm analytics forecast services.



Netherlands butadiene supply and demand balance, '000t Netherlands <---use drop-down Historical Estimate Outlook CAGR % 2026 2027 2028 2029 2030 2031 2032 2033 2019-2028 2023-2028 2028-2033 Capacity Extraction Netherlands butadiene supply and demand Dehydrogenation '000t Total capacity 450 **Production sources** 400 Steam cracker 350 BD via dehydrogenation Crude C4 production (contained BD) 300 Co-cracking 250 Hydrogenation Crude C4 imports 200 Crude C4 exports 150 Western Europe <---use drop-down menu to select reaid **Butadiene productio** CAGR % 100 Imports 2023-2028 2028-2033 **Total supply** Western Europe butadiene supply and demand -0.4% 0.0% 0.0% Derivative capacity (butadiene) 0.0% 0.0% 0.0% Acrylonitrile-butadiene-styrene 2019 2020 2021 2022 2023 2024 2025 20;650 -0.4% 0.0% 0.0% 3,000 Adiponitrile Methylmethacrylate-butadiene-styrene 846 -1.8% 0.5% -0.8% 2,50 0 0.0% 0.0% 0.0% Other - butadiene 846 -1.8% 0.5% -0.8% 2.000 Netherlands butadiene demand by derivati Other - elastomeric polymers -2.0% 255 17.6% 3.9% Nitrile rubber -7.5% 175 10.2% 4.2% Nitrile rubber latex 234 -0.1% 9.1% 1.3% 10 92 -3.3% -5.7% 0.2% Polybutadiene rubber 558 -3.3% -0.1% 0.4% Polychloroprene rubber Other - BD Styrene-butadiene latex Styrene-butadiene rubber emulsion SBC Styrene-butadiene rubber solution 114 0.0% 0.0% 0.0% 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 203 Styrenic block copolymers SBR Total derivative capacity SB Latex Derivative consumption (butadiene) Western Europe butadiene demand by derivative 0.0% 0.0% 0.0% Acrylonitrile-butadiene-styrene 0 0 0 PBR '000t Adiponitrile 0 0 0 0 0 0 0 0 0 0 0 0 0 0.0% 0.0% 0.0% 0 0 100 150 200 0.0% Methylmethacrylate-butadiene-styrene 0.0% 0.0% 8 ADN 8 0.0% Other - butadiene 0.0% 0.0% 0 0 0 0 0 0 0 0 0 0 0 0 0 Other -Styrene-butadiene rubber emulsion Styrene-butadiene rubber solution Styrenic block copolymers Total derivative capacity 2,212 2,231 2,249 2,246 2,276 2,180 2,150 2,193 2,234 2,234 2,234 2,234 2,234 2,234 2,234 -0.4% 0.0% 0.1% Derivative consumption (butadi Acrylonitrile-butadiene-styrene Adiponitrile Methylmethacrylate-butadiene-styrene Other - butadiene Other - elastomeric polymers Nitrile rubber Nitrile rubber late Polybutadiene rubber 0.00/ Delivale مام معرما امعفريما معرمين Regional dashboard Country dashboard World (+) Content ×.

Associated Data

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Butadiene Analytics Balance 2023; global supply, demand and trade by country

Subscription includes detailed Excel downloads

Associated Data, continued

Capacity list for Butadiene with first-line derivatives and Company Balances

Subscription includes detailed Excel downloads

Argus direct		argus								
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Executive summary

How did we get here?

- Producers and consumers across the globe would agree that 2024 was a peculiar year. At the end of 2023 during term negotiations, both anticipated ample supply. Consumers opted to reduce committed volumes in 2024.
- The reality is that demand was slightly better than planned in 2024. More importantly, crackers were running at lower rates and opting for lighter feedslates. There have also been cracker closure announcements in northwest Europe and Japan.
- Large consumers in the three major regions were forced to purchase spot volumes.
- China has still been importing, in spite of the new BD capacity additions.
- High freight rates along the Red Sea and Panama Canal plus longer transit times have resulted in an upheaval of logistics.
- This is why global BD prices were especially volatile, given that large consumers were exposed to the spot market in the face of snug supply.





Executive summary

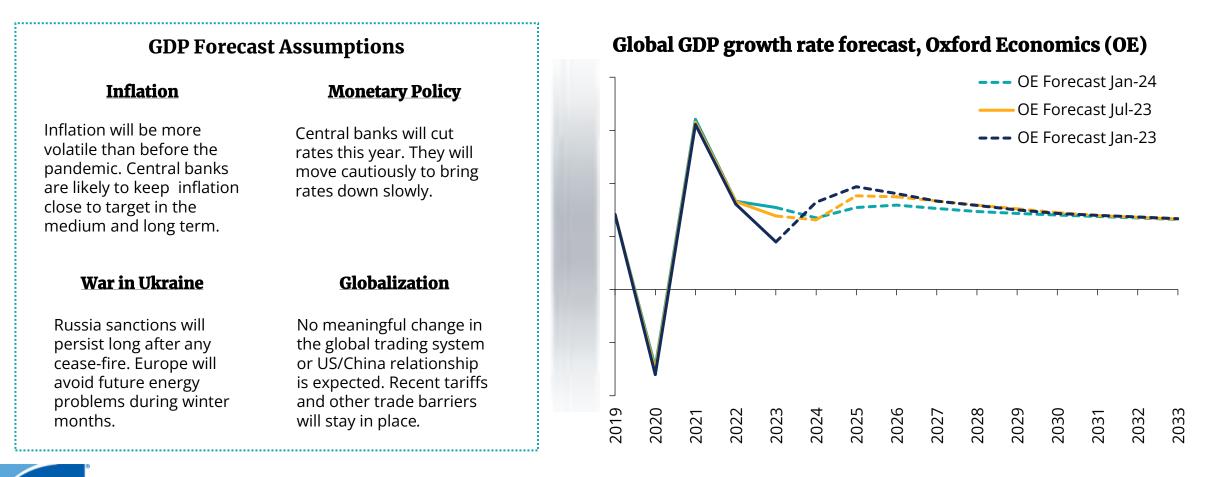
Where are we headed?



- Butadiene has been and will remain a mere by-product of a cracker. Output is dictated by non-durable polymer demand while BD is heavily dependent on durable good orders.
- The 2023-2033 compound annual growth rate (CAGR) for global ethylene production via a steam cracker is about whereas BD production will lag at just under Longer-term olefins production growth could slow on sustainability initiatives.
- Yield factors for crude C4 output from steam crackers have been reduced while co-cracking and hydrogenation were boosted to manage balances, particularly in the last half of the forecast period.
- On paper, Asia-Pacific should become self-sufficient, and imports should disappear. While imports have slowed, the market has been inefficient with the region importing deep sea BD cargoes.
- In Europe chemical giants LyondellBasell, ExxonMobil, Sabic, Dow and BASF have either made cuts or are conducting strategic reviews of assets.
- The US Gulf coast will continue to confront the unpredictability of hurricane threats.

Global: Economy

Central banks appear to have tamed inflation for now. The global GDP forecast continues to be revised lower for longer as China's growth lags.



China macro factors

Beijing has unveiled recent initiatives to boost consumption.

- In May the IMF raised its projection of China's gross domestic product (GDP) growth to in 2024 and pc in 2025, because of China's strong first-quarter GDP data and recent policy measures.
- The People's Bank of China to <u>issued new mortgage easing policies on</u> <u>17 May</u> to support the market. Mega cities like Shanghai, Shenzhen and Guangzhou have announced policies to ease downpayments for homebuyers since then.
- The government's provision of Yn1 trillion of reconstruction special bonds, Yn1 trillion of ultra-long bonds, and Yn1 trillion of refinancing bonds also reflect Beijing's efforts to help debt-ridden local governments.
- Real estate investment dropped by pc in April compared with a year earlier. The "real-estate climate index" which measures the general performance of property sector dropped to in April, continuing to break historic lows, NBS data show.
- Subsidies have been issued for up to for each car purchase and mn of consumption coupons to travelers.
- The IMF expects China's GDP growth to slow to pc by 2029 because of an aging population and slower productivity growth.





Executive Summary Spotlight

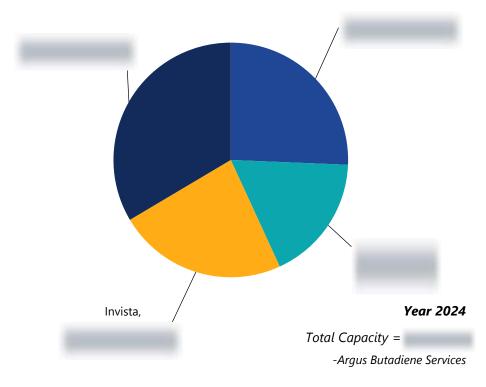
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Adiponitrile The Crude C4-derived ADN market rebalances itself.

- The adiponitrile segment, like the rest of the BD market, has had a dynamic 2024 to date. The jumping point was when Invista in October 2023 permanently shut its t/yr facility in . The company cited "lower-than-anticipated growth and an increase in global supply."
- In turn European ADN production in the first half of 2024 jumped to cover for planned turnarounds in both the US and China, plus global rebalancing.
- Estimated operating rates for France's Butachimie escalated to the high range in the first half of 2024, from : since the Russia-Ukraine conflict.
- Dutch TTF natural gas prices on a day ahead basis have eased, according to *Argus* data. From January to June 2024 prices averaged
 € MWh from July to December 2023 and € MWh from the same period a year earlier. This has alleviated some of the margin pressures on French ADN production.

Global adiponitrile capacity based on butadiene feedstock 000't



*Butachimie is a joint venture between Invista and BASF



Water restrictions in Mexico

• The Mexican state of Tamaulipas and the federal interior ministry enforced water restrictions because of an ongoing severe drought. This has slowed or even stopped operations in the port cities of Tampico, Madero, and petrochemical hub Altamira in May and June 2024.

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Company Name	Affected Capacity (000't)	Derivatives
Company Name SABIC	Affected Capacity (000't)	Derivatives
	Affected Capacity (000't)	Derivatives
SABIC	Affected Capacity (000't)	Derivatives Image: Im



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Regional Butadiene production

China

• The CAGR for 2023-2033 for BD capacity will expand by 'pc with derivative capacity at pc.

US

 Prolonged ethane cracking since and into the second quarter, coupled with supply constraints, supported higher BD prices.

Western Europe

• Two crackers will shut by the end of 2024: 1. northern France and 2.

Central and eastern Europe

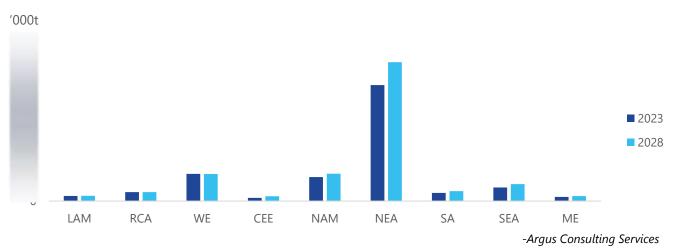
• There could be a risk to a new BD unit in the region, depending on whether a cracker project proceeds as planned.

Russia

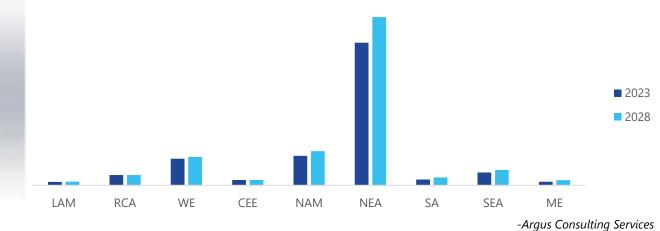
• We are projecting flat long-term for both BD production and consumption given geopolitical uncertainties.

Southeast Asia

• Technical issues at units in Malaysia, the Philippines and Vietnam have resulted in less BD output but an uptick in crude C4 exports.



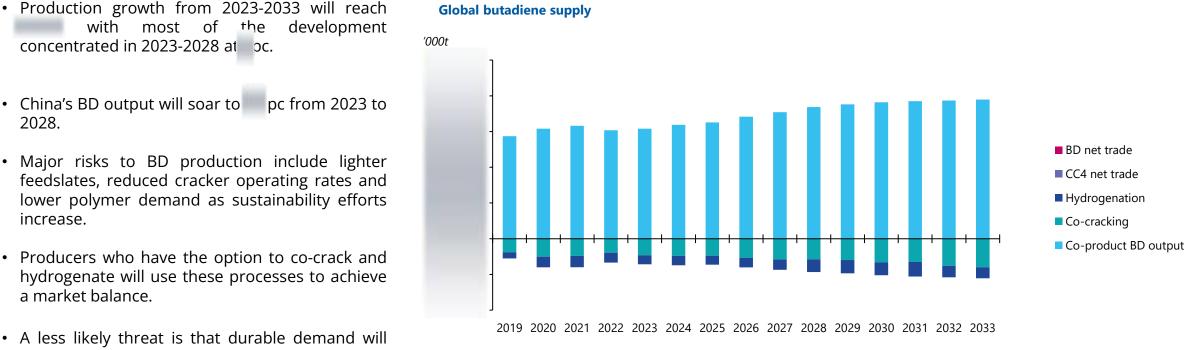




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World butadiene industry overview, 2019–2033 A majority of the growth is slated for the first half of the forecast period.



-Argus Consulting Services

outpace nondurable orders.

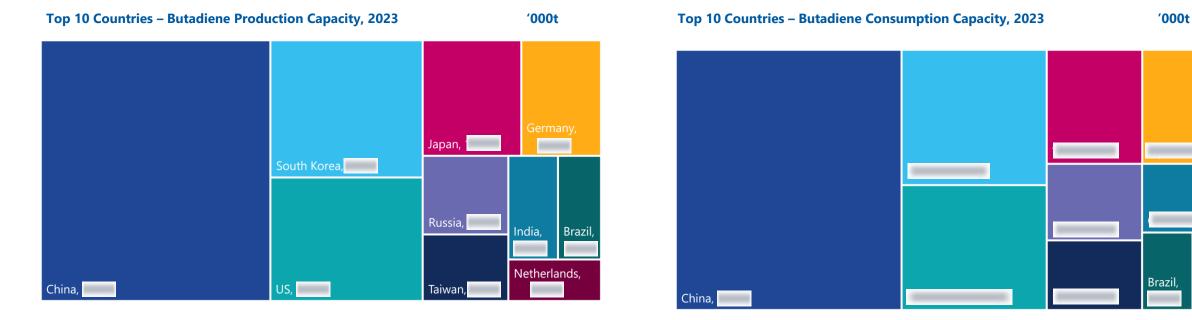
2028.

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World butadiene industry overview, 2019-2033

Asia-Pacific will remain the production and demand center.

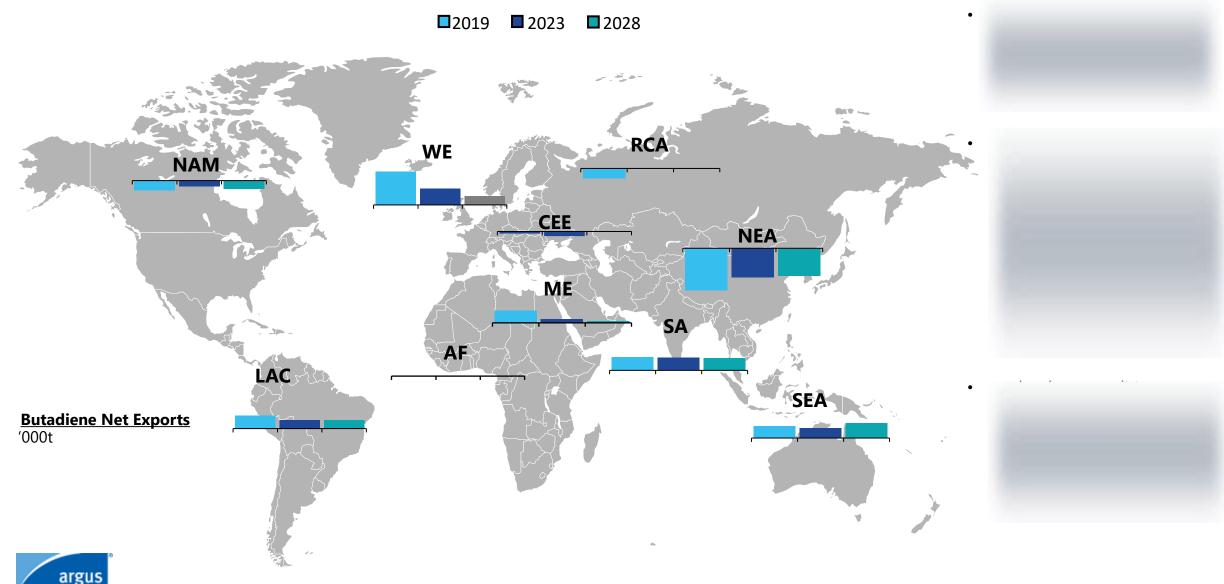
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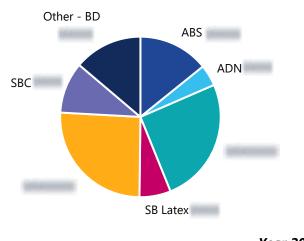
India

Butadiene trade



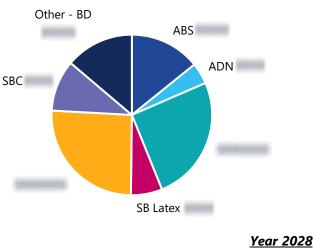
World butadiene industry overview

Global butadiene demand 2023



Year 2023 Total demand = mn t -Argus Consulting Services

Global butadiene demand 2028

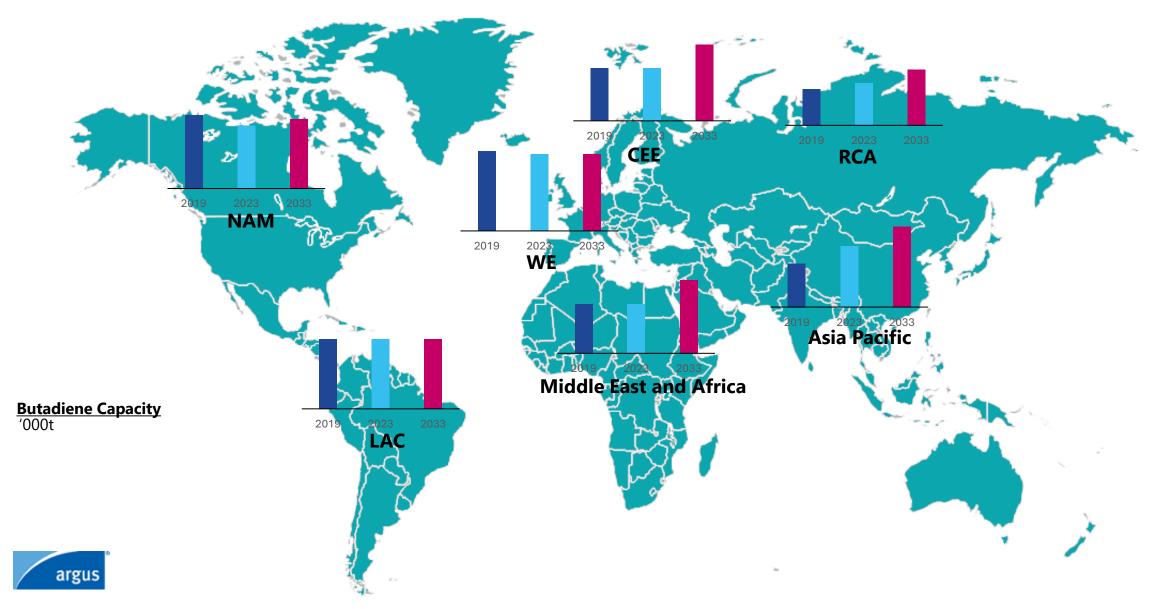


Total demand = mn t -Argus Consulting Services

- World butadiene production is projected to grow pc from 2023 to 2028 but stabilize between 2028 to 2033. The slowdown is attributed to sustainability efforts and moderate economic growth throughout the end of the forecast period.
- High interest rates have kept western buyers away from purchasing durable goods and new homes. This is why demand is slated to grow pc from 2023 to 2028.
- Passage through the Panama Canal has improved since the start of this year, but Red Sea conditions remain highly volatile with no signs of improvement.

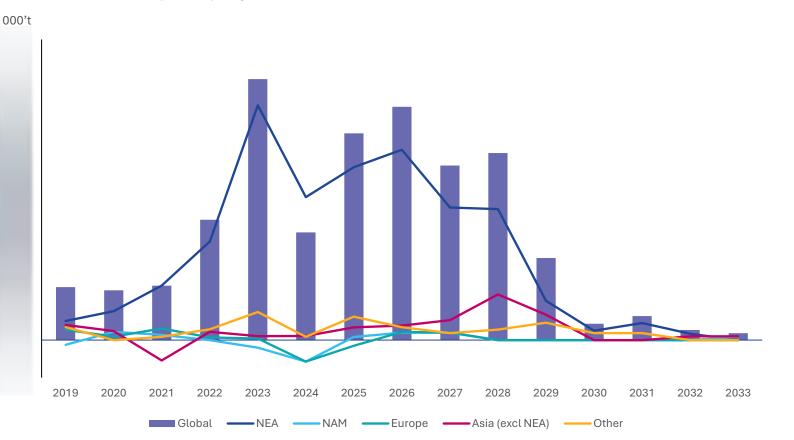


Butadiene capacity expansions



Derivative capacity additions The ABS and SBC segments will lead the way.

Global Butadiene consumption capacity additions / shutdowns



- The bulk of derivative expansions are in Asia-Pacific, namely China.
- Acrylonitrile butadiene styrene, styrene block copolymer and solution styrene butadiene rubber will have the large growth. Newer, efficient units are expected to drive more mature assets to reduce rates or even permanently idle.
 - During peak covid, demand nitrile rubber latex for medical gloves exploded. Since then, demand has normalized.

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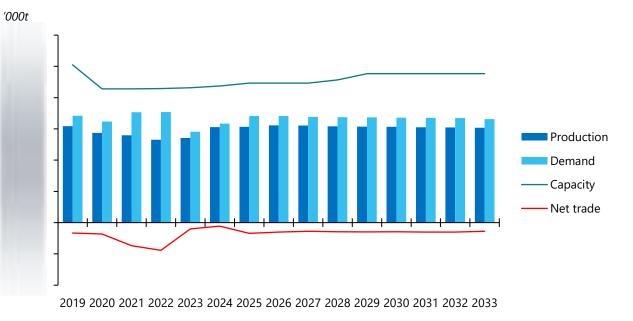
North America butadiene summary

Ethane cracking continues to dominate.



- New cracker capacity has slowed as North America's export role continues to grow.
- Cracker operating rates will run in the high 'spc in 2029 and beyond.
- By 2031, high operating rates and a sustained ethane cost advantage will likely lead to at least one additional cracker project.

North America butadiene supply and demand

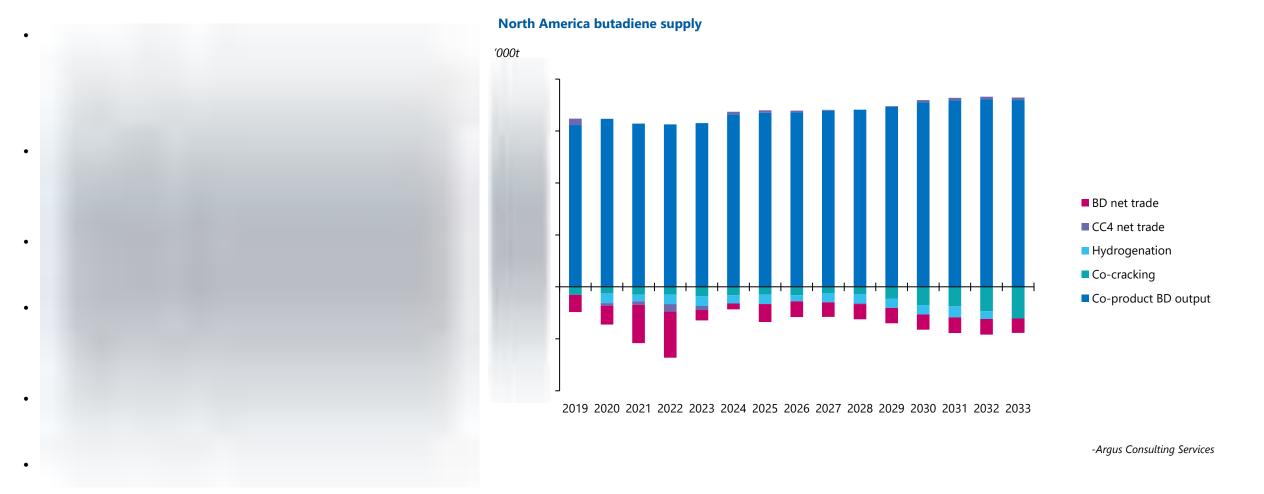


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North America supply, 2019–2033 TPC is slated to expand in 2024.

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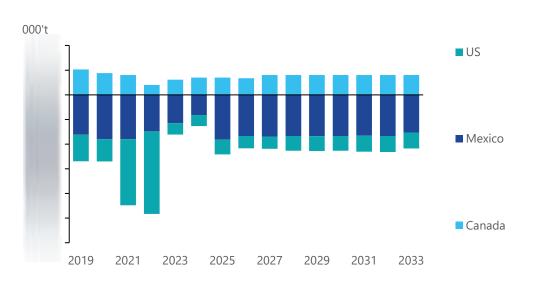


North America demand, 2019-2033

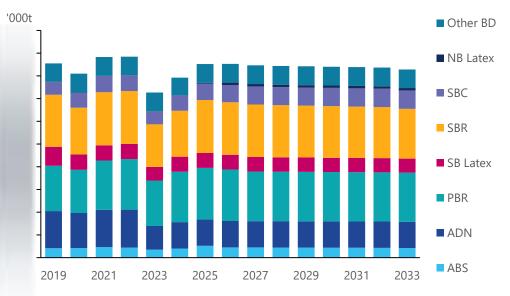
The US will move closer to a balanced state.



North America butadiene net exports



North America butadiene demand

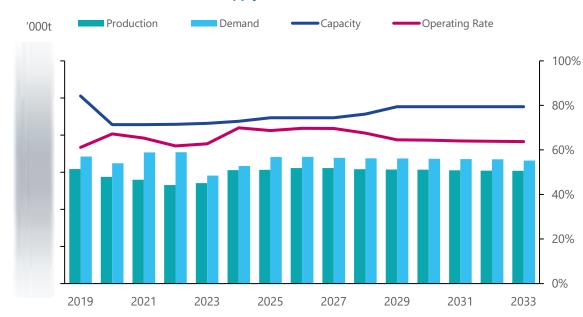


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North America demand projects, 2019-2033

The region will see some derivative expansions in the coming years.

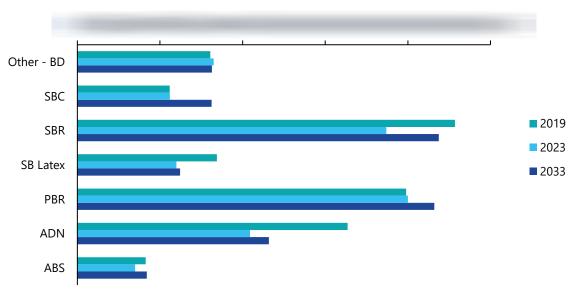




North America butadiene supply / demand

North America butadiene demand by derivative

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

The Argus Butadiene Analytics service is for anyone engaged in the butadiene market and seeking insight into the fundamentals driving key trends, including global supply, demand growth, trade, operating rates, etc.

If you want to learn more about becoming an Argus subscriber and receiving full PDF reports complete with accompanying Excel data files twice a year, click below:



Contact us



Angie Joe

Vice President Global Butadiene and Derivatives

Angie leads the crude C4, butadiene and derivatives consulting practice at Argus. She spearheads the creation and production of the butadiene newsletter, monthly outlook and long-term supply and demand analytics publications. Angie has more than 15 years' experience in the petrochemical industry, including roles as an analyst and broker, and in business development and communications. She also has expertise in styrenics, aromatics, olefins and methanol. Angie enjoys tapping her experience along the entire petrochemical value chain to piece together market information in a global context.



Akash Chavanke Business Analyst - Chemicals

Akash is involved in improving the granularity of integrated aromatics and olefins derivative markets. He previously spent one and half years at Prismane Consulting in Pune, where he worked on projects related to specialty polymers, bulk polymers, petrochemicals, bio-plastics and inorganic chemicals. Akash holds a B.Tech degree in Petrochemical Engineering from Maharashtra Institute of Technology, Pune.



Brian Leonal

Editor – Chemicals Asia

Brian Leonal is the Asia Pacific editor of Argus' petrochemicals desk. He has nine years of experience in the hydrocarbon industry. Before joining Argus for the second time, he was a corporate banker in DBS Bank covering oil and gas as well as petrochemical markets. He has been involved in a diversity of transactions, including asset-backed, project, trade, and M&A financing, as well as clean corporate loans. He started his career in Argus in 2015 as part of the petrochemical team, with exposures to olefins, aromatics, and polymers.

Argus acronyms

- Aa Australasia
- AFR Africa
- ARA Amsterdam Rotterdam Antwerp
- b/d barrels per day
- bl barrel
- bn billion
- Btu British thermal unit
- CAGR Compound annual growth rate
- CEE Central and Eastern Europe
- CTO/CTP Coal to olefins/Coal to propylene
- DME Dimethyl Ether
- DMT Dimethyl terephthalate
- EIA Energy Information Administration
- EPA US Environmental Protection Agency
- ETBE Ethyl tertiary butyl ether
- HAc Acetic acid
- HCHO Formaldehyde
- INO Indonesia
- kl Kiloliter
- LAC Latin America and Caribbean

- LPG Liquid petroleum gas
- ME Middle East
- MDF Medium density fiberboard
- MDI Methylene diphenyl diisocyanate
- MEA Methylamines
- MeOH Butadiene
- MMA Methyl methacrylate
- mn million
- MTBE Methyl tert-butyl ether
- MTO/MTP Butadiene to olefins/Butadiene to propylene
- NAM North America
- NEA Northeast Asia
- NZE New Zealand
- OSB Oriented strand board
- PET Polyethylene terephthalate
- POM Polyoxymethylene
- PBT Polyethylene butyl terephthalate
- pc percent
- RCA Russia and Central Asia
- RFS Renewable Fuels Standard

- ROW Rest of world
- SEA Southeast Asia
- SA South Asia
- t metric ton
- t/yr metric tons per year
- TAME Tertiary amyl methyl ether
- VAM Vinyl acetate monomer
- WE Western Europe
- yr year
- eSBR Emulsion Styrene Butadiene Rubber
- sSBR Solution Styrene Butadiene Rubber



Argus Butadiene and Derivative services

Argus experts combine decades of experience and insight in analyzing the global markets for butadiene, from the upstream wellhead, via refineries and steam crackers, to downstream products such as synthetic rubber.

An Argus market service

Weekly Butadiene Report

- Ongoing commercial analysis of events and trends
- Current contract and spot pricing for key markets

Monthly Market Outlook

• 24-month rolling price forecast for all major regions

Butadiene Analytics

- 5-year history, 10-year forward global butadiene supply/demand
- Trade capacity data forecast
- Quarterly updates addressing key industry trends
- Argus analyst access provides customers with tailored support

Audience

• Anyone associated with the global butadiene industry, including producers, consumers, end users, traders, shippers and investors

Click here to learn more about Argus Butadiene Services



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