



BEROE

Advantage Procurement

Beroe Category Forecast

Foreword

Welcome to the Category Forecast 2024, a practical and data-driven guide for procurement professionals. This report provides detailed forecasts for 12 key procurement categories, aiming to offer clear insights and actionable intelligence for this year.

In this document, Beroe has focused on delivering concise, evidence-based analysis to help you understand the trends and changes expected in 2024. Each category is examined with a focus on relevant market developments, emerging opportunities, and potential challenges.

Our goal is to equip you with the necessary information to make informed decisions, streamline your procurement strategies, and effectively manage your resources. Whether you are planning, negotiating, or looking to optimize your procurement processes, the Category Forecast 2024 is designed to be a valuable asset in your toolkit.

We trust that this report will be a useful resource for you and your team as you navigate the procurement landscape in 2024.

At Beroe, we are committed to delivering continuous insights like these, powered by our AI engine Abi, the bedrock of our flagship product Beroe LiVE. Abi enables conversational intelligence, making it possible for thousands of procurement professionals across the globe to access tailored, timely, and relevant information. This unique feature empowers users to stay ahead of market trends and make informed decisions quickly.

Please note that we have released only a select set of categories in the public domain. If you would like your category to be covered, please write to contactus@beroe-inc.com.

Wish you all a Happy New Year!

Team Beroe

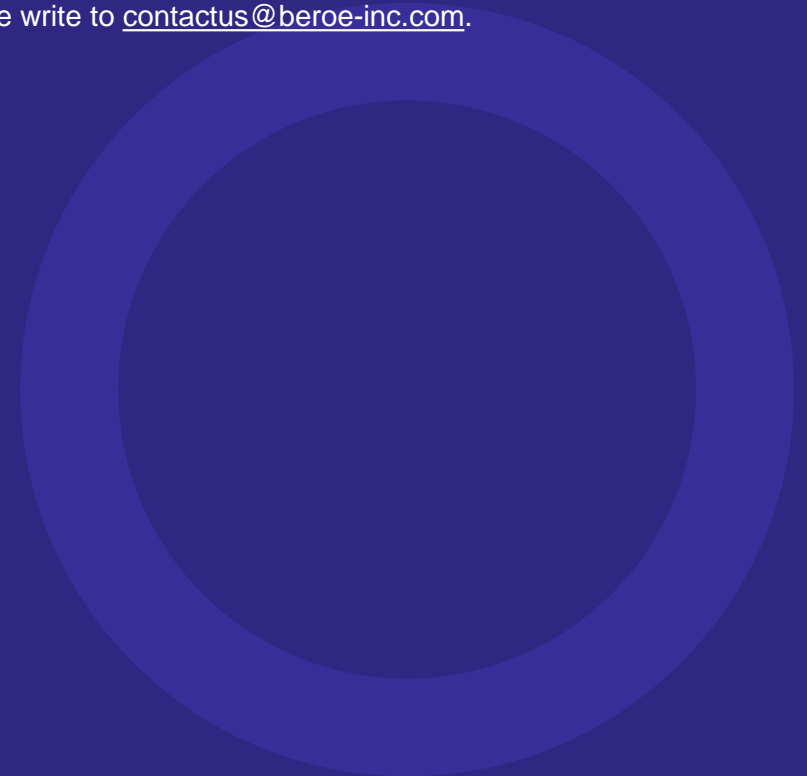


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BATTERIES

Batteries – Global Supply Demand Outlook

- The global market size for lithium-ion batteries is estimated at **\$71.2 billion for 2023** and is expected to grow at a CAGR of **14–16 percent to \$109.23 billion by 2026**. This growth will be driven primarily by the demand from electric vehicles (EVs)
- In Q1 2024, prices of raw materials are predicted to slow down, majorly due to sufficient supply, especially with regards to lithium in the market, particularly from increased production in Africa and Australia. However, the industry is expected to gain momentum from Q2 onward

BY H1 2024



SUPPLY OUTLOOK:		DEMAND OUTLOOK:		PROFIT MARGIN OUTLOOK:	
<ul style="list-style-type: none"> • Major battery manufacturers, like Panasonic and LG Energy Solution, have currently cut back on product development in places, like the US and Poland, due to a drop in demand. This decrease is linked to the recent government rules • For example, in the US, expensive EVs that are priced above \$80,000 do not qualify for tax credits under the Inflation Reduction Act, causing a drop in demand for these cars. However, government subsidies and grants are expected to help battery suppliers despite the current fall in demand • Chinese lithium-ion battery exports are expected to continue to grow in 2024 • In the short to medium term, the US and European markets are still expected to depend on Chinese supply 		<ul style="list-style-type: none"> • In the short term, a slight drop in demand is anticipated, due to a slow down in global demand in the EV segment and drop in prices of key raw materials, such as lithium, nickel, and cobalt • Demand from other key segments, such as alternative industries, including renewables, grid and PV systems, data centers, Battery Energy Storage Systems (BESS), and others are expected to boost the demand going forward • Government policies, such as the Inflation Reduction Act (IRA) and Bipartisan Infrastructure Law in the US and the EU Batteries Regulation, coupled with innovation funding, are anticipated to accelerate the future demand 		<ul style="list-style-type: none"> • Presently, the prices of raw materials, like lithium carbonate, are facing pressure, due to increased supply and reduced demand • The ongoing negotiations for 2024 term contracts between numerous producers and consumers are leading to fewer finalized spot market deals • The prices are expected to witness an increase in the long term, due to the expanding global EV manufacturing market • Increased vertical integration is likely to help battery manufacturers to secure their raw material needs and maintain stronger profit margins 	

LEGEND

 Stable,
  Quarterly Increase Favorable,
  Quarterly Decrease Favorable,
  Quarterly Increase Unfavorable,
  Quarterly Decrease Unfavorable



Batteries – Market Trends & Impact

MARKET IMPACT



INCREASING INVESTMENTS IN UPSTREAM VALUE CHAIN

The market is expected to witness more investments in its upstream value chain by auto and battery makers in the form of mergers/joint ventures, etc., resulting in strategic industry consolidation and more resilient supply chains.

- *Stellantis and CATL are collaborating on establishing a factory in Europe to produce cost-effective EV batteries. The initial agreement focuses on supplying lithium iron phosphate (LFP) battery cells and modules to support Stellantis' EV manufacturing in Europe*
- *Zhejiang Geely Holding Group (Geely) and NIO Holding (NIO) have formed a strategic partnership centered on battery-swapping technology. The agreement involves collaboration on battery technology standardization, the expansion of battery swapping networks, and the development of swappable vehicle models*



INCREASING TRACTION OF LFP OVER NMC BATTERIES

Increased demand for lithium iron phosphate (LFP) batteries, owing to improved energy density, longer cycle life, improved safety, lower costs, and no requirement for nickel and cobalt use, etc.

- *Battery manufacturers are prioritizing LMFP, NMx, and LNMO cathode chemistries to lower cell costs and mitigate supply chain limitations. Major players in the battery industry, including CATL and Samsung, have introduced LFP fast charging technologies and successfully commenced mass production starting this year end (2023)*



BATTERY RE-USE AND RECYCLING PROSPECTS

Battery recycling is gaining importance from a supply chain and environmental, social, and corporate governance (ESG) responsibility perspective. Additionally, this eases critical battery grade commodity availability.

Used EV batteries can be used as energy storage for grids for another decade, facilitating the supply of green power.



KEY WATCH-OUT FACTORS:

- *Localization of battery manufacturing in Europe and the US*
- *Implications from government regulations, such as Inflation Reduction Act on Chinese suppliers' investments in the US market*



LABOR

Key Market Trends in the Labor Industry

The labor industry is recognizing several structural shifts in 2024. Economic and political imbalance leads to uncertainty in the labor market. The economy in 2024 will witness more hybrid work, severe skill shortages, and high usage of AI, machine learning and automation.

TRENDS IN LABOR INDUSTRY

LABOR DEMOGRAPHY

- The labor force is projected to reach 163.8 million in 2024 growing at an annual rate of 0.5 percent. Declining labor force participation rate and aging population are expected to contribute to the slower rate of labor force growth
- Share of women is projected to increase from 46.8 percent in 2014 to 47.2 percent in 2024
- The workforce has drastically shifted from male dominance to a club of elderly women, students, migrants, people with disabilities, minorities, etc.

WORK DIVERSIFICATION

- Focus on employee experience and work-life balance has become a priority to boost employee satisfaction
- Due to changing needs and requirements by employers, workforce diversification has become the trend. Different types of temporary labor are being employed across sectors
- Remote work has become the priority with workforce diversity across industries. About 83 percent of women are preferring remote work

TECHNOLOGY

- Technological change has been a blessing and curse to the labor market through job creation and destruction
- The wage gap between the more and less- educated workers has grown significantly, owing to technology interventions
- Demand for AI and blockchain talent has been increasing across industries and geographies. Employers are eyeing on top talents for fulfilling the jobs created by machine learning
- Hybrid work model is expected to increase to 81 percent in 2024

SKILL DEMAND

- Global skill shortages are expected to exceed 85 million by 2030
- Workforce models and skills demand are changing according to the current requirements of employers across industries and job categories
- By 2030, Russia will have a shortage of up to 6 million people, and China will have as twice as Russia
- Organizations and government should prioritize in talent strategy and take steps to educate, train, and upskill existing workforces

Key Market Trends in Employee Benefits

The pandemic has shifted the emphasis on employee well-being priorities, prompting companies to concentrate on retaining their workforce by enhancing the employee experience. It includes addressing payroll inquiries through easily understandable pay slips, refining relocation policies to provide flexible benefits, and improving employee health plans.

- Employers are revising their benefits offerings to prioritize the overall well-being of employees, understanding that a content and healthy workforce not only boosts productivity but also fosters improved employee retention
- Employers are improving mental health benefits with an emphasis on stress management. Additionally, there is a heightened investment in fostering the financial wellness of employees
- In payroll, suppliers' acquisition will increase. For example, SD Worx has recently acquired Romanian Software S.R.L., the market leader in Romania payroll and Human Capital Management solutions

1

- In the upcoming years, improving employee experience will be the key measure in payroll departments. They are viewed as a valuable recruitment tool, presenting an appealing option that can distinguish companies from their competitors and empower them to attract top talent in an intensely competitive hiring environment
- The cost may increase, as the suppliers adopt payment apps and the latest technology to improve employee experience
- Apart from employee experience, data security is also considered of utmost importance among the companies

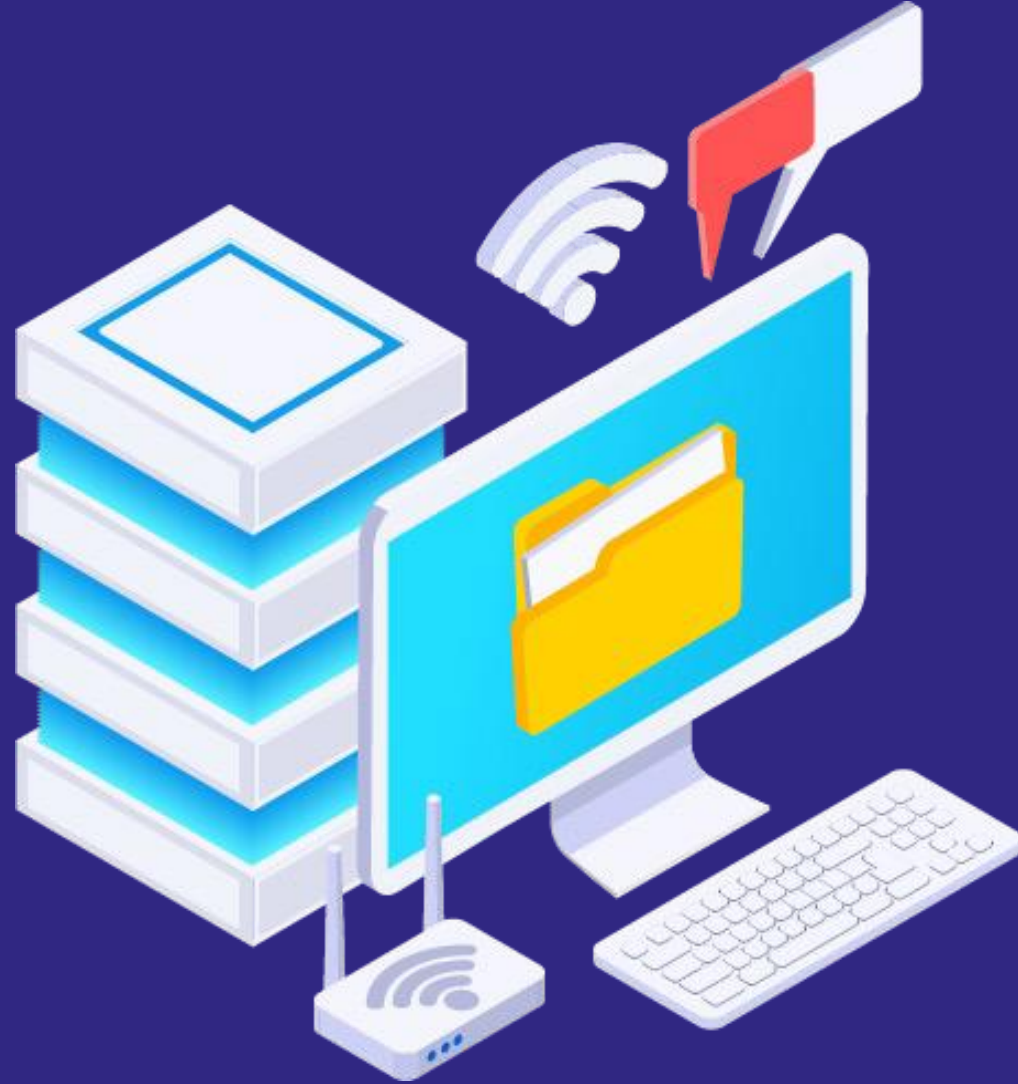
2

- The company's business travel has mostly returned to pre-pandemic levels, and their main priorities for the coming year are managing travel costs, sustainability, and new technologies
- Companies are prioritizing ESG/DEI, expecting partners to do the same, influencing employee decisions. Commitment, even in mobility programs, enhances talent attraction and retention. The mobility industry, driven by ESG/DEI initiatives, innovates with programs, like discard and donate, fuel-efficient transportation, and stress management support during relocations, recognizing their importance to stakeholders

3

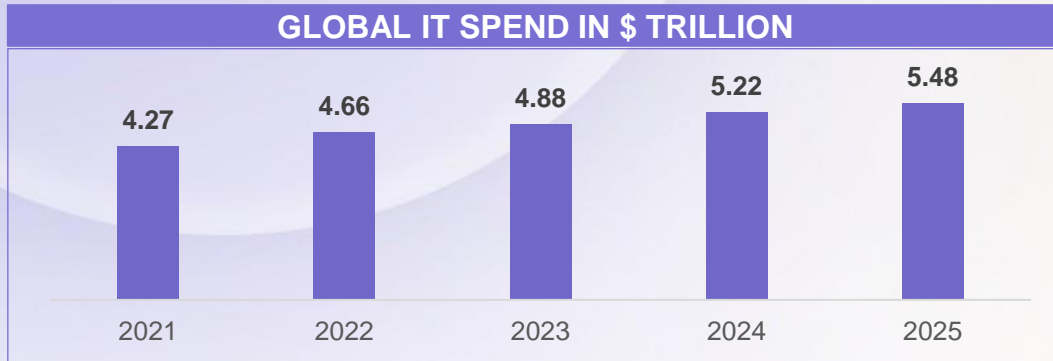
- Many companies will focus on consolidation of their suppliers, cost efficiency, and compliance
- In Europe, the payroll transformation is linked to cost reduction, cost control, and compliance. As the complexity of payroll in the top 10 countries, primarily in Europe, is significantly impacted by government regulations that present unique challenges
- In the APAC, integrating cost-effective solutions, HR transformation and automation, meeting compliance, and improving the employee experience are the focus areas





INFORMATION TECHNOLOGY

Information Technology: Software and Services



CATEGORY HIGHLIGHTS

MARKET TRENDS

CLOUD SERVICES

Cloud providers are increasing the prices, due to shortage of skilled resources & wage inflation. However, the growth of the SaaS market is expected to increase in 2024, and like 2023, the source of growth will be a combination of price increases and increased utilization.

DIGITAL TECHNOLOGIES

Global demand for IT modernization & digital technology projects are expected to remain strong in 2024, with potential threats, such as wage inflation and macroeconomic conditions.

BEST IT SOURCING PRACTICES

Enterprises are predominantly considering prominent niche/mid-size service provider for their digital transformation initiatives, as their workforce mostly constitutes of experienced skilled professionals. However, it is better to confirm with the service provider if they have the exposure and expertise in offering digital services.

GLOBAL MARKET – KEY TRENDS

- Worldwide IT spending is expected to be at \$5.22 trillion in 2024, an increase of 6.9 percent from 2023. Spending on software and IT services will see the highest growth in 2024, largely driven by technologies aligned towards data-driven decision making, automation customer, and user experience in 2024

MARKET RISK



Few IT service providers are reducing the headcount, which does not indicate low demand. The main reason for the layoff is lower-than- expected profits due, to economic conditions, wage inflation, and over hiring.

PRICE TENDENCY



Supply–demand gap for skilled IT resources, cost of recruitment/retaining talent, increase in market inflation are the key market drivers forecasted to lead to higher prices in the upcoming months.

90–95%

Net Supply*

85–90%

Net Demand*

8-12%

Price Change*

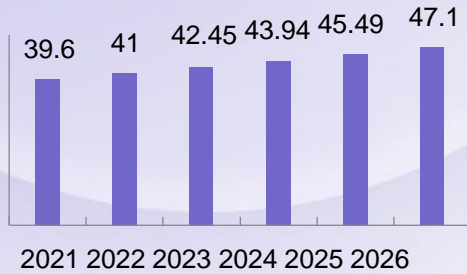


LEGEND

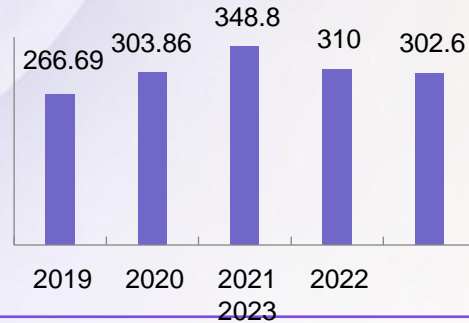
- Stable
- Increase Favorable
- Decrease Favorable
- Increase Unfavorable
- Decrease Unfavorable

Information Technology: Hardware

Ethernet Switch Market Revenue by Quarter (\$ Billion)



Global PC Shipment Volume (\$ Million)

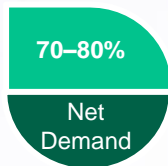
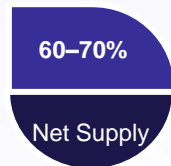


MARKET RISK (2023)

Manufacturers of IT hardware, including PCs, enterprise routers, and switches, are facing supply bottlenecks, owing to unavailability of chips to fulfill orders from increasing demand from enterprises for network infrastructure equipment.

PRICE TENDENCY

- The increase in price of products is predominantly driven by an increase in raw material cost, due to supply chain disruptions over the past years
- Major suppliers, such as Cisco, have attributed to the price rise to changed market dynamics, rising costs, and availability of certain components, increasing costs of third-party logistics and labor



LEGEND

- Stable
- Increase Favorable
- Increase Unfavorable
- Decrease Favorable
- Decrease Unfavorable

CATEGORY HIGHLIGHTS

TECHNOLOGY TRENDS

BYOD	DESKTOP VIRTUALIZATION	THIN CLIENT
Enterprises have started adopting a bring your own device (BYOD) policy as a game-changer for better employee satisfaction and increased productivity. The initiative has replaced notebooks with mobility devices.	The penetration of desktop virtualization in large enterprises has increased exponentially. The priority has shifted to cost optimization.	A thin client or a lean client, is a stateless desktop terminal that has no hard drive. When using a thin client, all features, such as applications, sensitive data, and memory, are stored in the data center. It is used as a PC replacement to access any virtualized application.

GLOBAL MARKET – KEY TRENDS

- The global PC market is expected to slow down in 2023, owing to market maturity in the educational sector and macroeconomic conditions
- The global IT hardware market is forecasted to grow steadily despite macro-economic pressures, affecting procurement budgets
- Availability of skilled digital resources is low, leading to higher cost of recruiting and retaining resources



AGRO

Global Grains Outlook

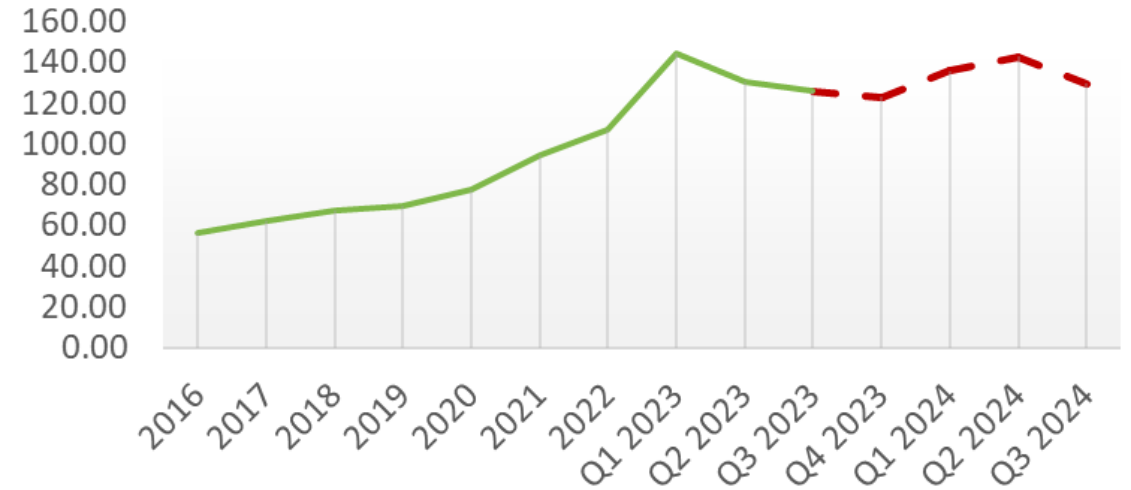
SUPPLY PROJECTIONS

CORN WHEAT RICE BARLEY

Ease in Price Pressure As Grain Supply Milieu Looks Favorable Barring Rice

- Global grain prices witnessed a downtick of about 5.6% month-on-month, mainly driven by a sharp dip in corn, owing to an increase in farmers' selling activity in Argentina and incoming seasonal supplies in the US, where production estimates were higher than anticipated.
- Global barley prices witnessed a dip, while sorghum prices firmed slightly
- World wheat prices also declined, by about 2.4 percent in November, mainly driven by increased seasonal supplies in Argentina and Australia, in addition to the continued strong competition from Russia
- The overall rice prices remained mostly stable month-on-month despite amidst contrasting price movements in the major growing regions

BEROE GRAINS COMPOSITE PRICE INDEX



Base Year: 2012

PRICE OUTLOOK





Grains	2022 (Avg) \$/MT	2023 (E. Avg) \$/MT
Barley	302	338
Corn	272.8	222.76
Wheat	369	303
Rice	352	416

PRODUCTION OUTLOOK FAVOURABLE UNFAVOURABLE STABLE



Global Grains Outlook

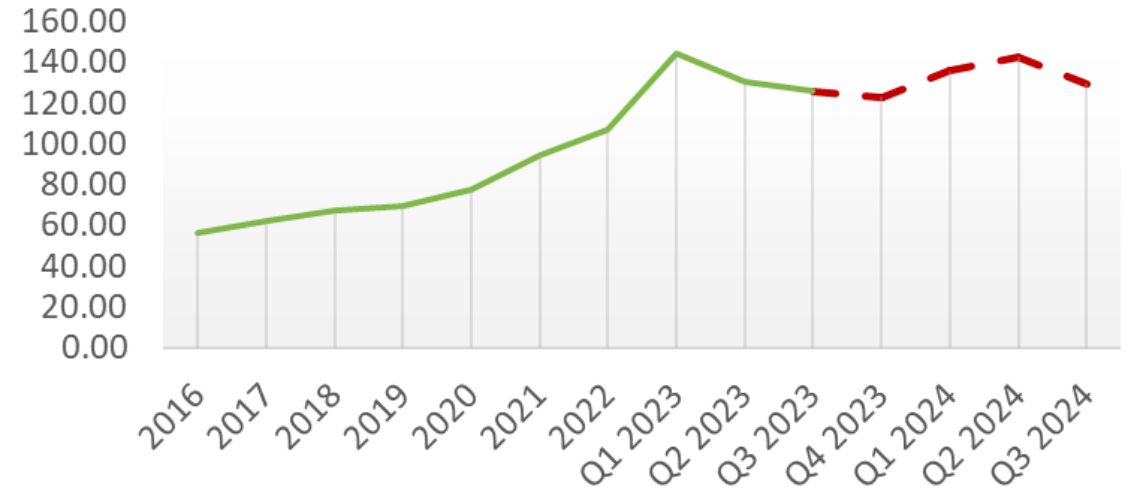
SUPPLY PROJECTIONS

CORN  WHEAT  RICE  BARLEY 

War, El Nino, and Waning Demand to Impact Grains Trade

- Though global barley supplies are expected to be slightly bigger than previously expected, it is forecast to be tight in 2024 in addition to dwindling ending stocks
- Despite higher rice prices, the continued decline in corn and wheat prices is expected to balance the overall trend
- Even with other grain prices witnessing a downtick, rice prices is likely to be an exception with an uptick in prices anticipated owing to India’s export curbs on rice and concerns of EL Nino
- Bumper harvests for corn and wheat in major producers such as Russia and Brazil will support a bearish market
- However, despite the forecast decline, overall grain prices will still likely remain higher than pre-Covid levels
- Trade is likely to pick up pace in the coming months for wheat, corn and barley




BEROE GRAINS COMPOSITE PRICE INDEX



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PRODUCTION OUTLOOK FAVOURABLE  UNFAVOURABLE  STABLE 



Global Vegetable Oil Outlook

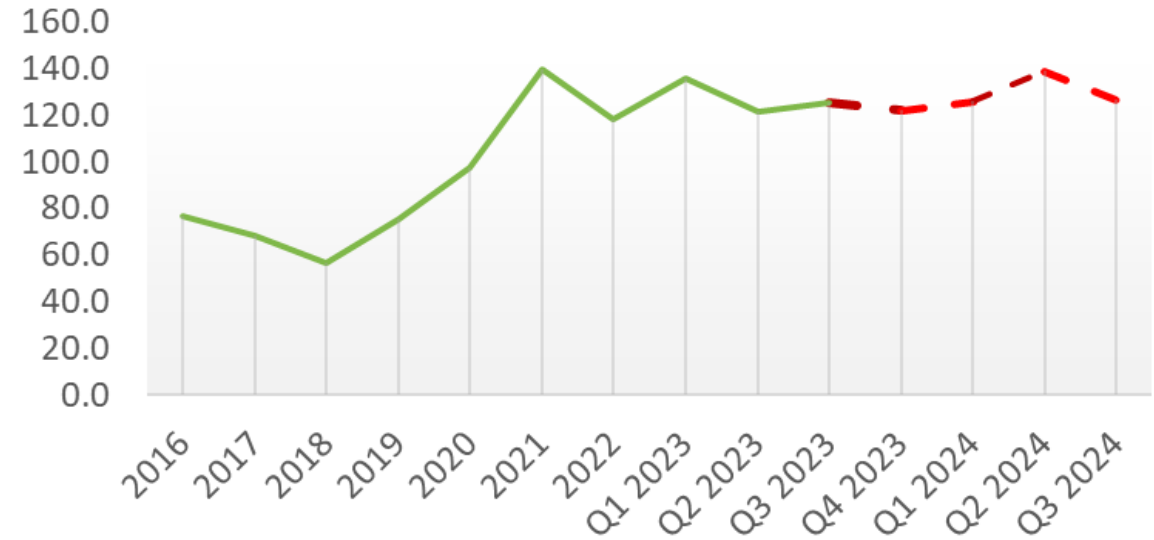
SUPPLY PROJECTIONS

SOY OIL PALM OIL SUN OIL RAPESEED OIL

Drought to Dictate Availability, While carryover Stocks and Demand Impact Buying Decisions

- The increase in the vegetable oils price index was driven by higher global palm and sunflower oil prices, which more than offset the lower soy and rapeseed oil prices
- Global palm oil prices rebounded by more than 6 percent in Q4-2023, driven by increase in buying on the back of lowered out in major producing countries
- Global sunflower oil prices also witnessed a moderate uptick, mainly supported by a consistent pace of import purchases
- Continued surplus world supplies of rapeseed oil contributed to lower prices
- However, the world soybean oil prices dropped slightly on subdued global import demand

BEROE EDIBLE OILS COMPOSITE PRICE INDEX



Base Year: 2012

PRICE OUTLOOK

Grains	2022 (Avg) \$/MT	2023 (E. Avg) \$/MT
Soybean Oil	1651	1363
Crude Palm Oil	1352	965
Sunflower Oil	1647	1010
Rapeseed Oil	1746	1041

PRODUCTION OUTLOOK FAVOURABLE UNFAVOURABLE STABLE



Global Vegetable Oil Outlook

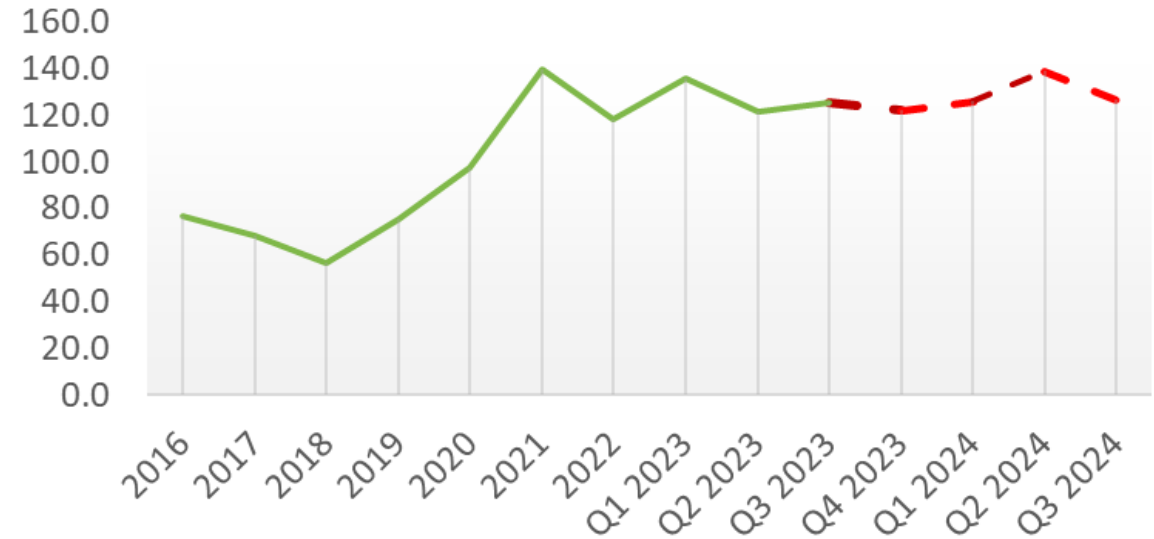
SUPPLY PROJECTIONS

SOY OIL ↓ PALM OIL ↓ SUN OIL ↑ RAPESEED OIL ↑

Feeble Demand and Lowered Production Prospects

- The global oilseeds production forecast is lowered in Q4-2023 owing to a significant drop in Brazil soybean crop, which more than offset the higher production of rapeseed in Australia and Canada.
- Global oilseed trade witnessed an uptick, riding on increased exports from Brazil for soybeans and rapeseed for Canada and Australia
- The high carryover stocks in Brazil from previous year's record harvests can be attributed for the continued export competitiveness despite a drop in current outlook
- Oilseed crush is up slightly, driven by increase in rapeseed crush in Canada. However, Australian crusher's interest are waning due to higher Canadian supply in the market
- Vegetable oil trade is unchanged with larger rapeseed oil exports offset by reduced palm oil trade
- Palm Oil trade witnessed a downtrend, causing suppliers and manufacturers to overlook the production slump
- Lowered demand from industrial consumption sectors, concerns about bio-diesel mandates due to lowered crude oil prices and a drop in soybean oil prices can be attributed for the demand dip

BEROE EDIBLE OILS COMPOSITE PRICE INDEX



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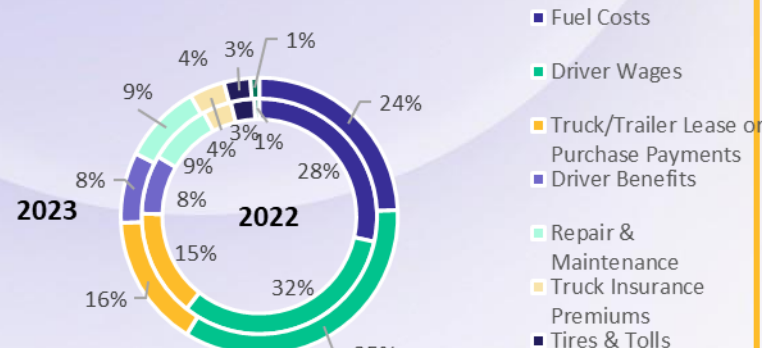
PRODUCTION OUTLOOK FAVOURABLE ↑ UNFAVOURABLE ↓ STABLE ↔



LOGISTICS

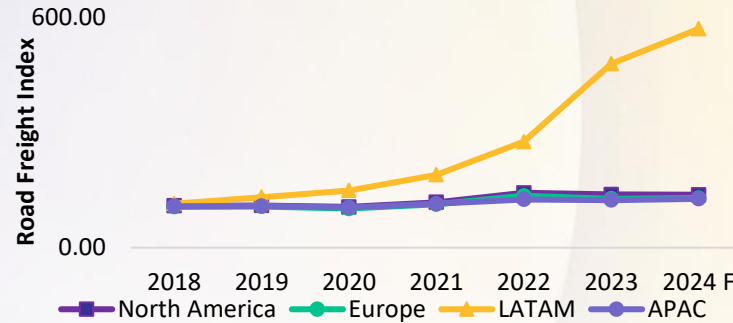
Logistics – Road Freight

TRUCK OPERATING COST STRUCTURE 2023



Driver wages and fuel persist as the primary cost elements in road freight transport. This year, driver wages experienced a notable increase compared to last year, while fuel is projected to maintain its position with a slight decrease in contribution, constituting 24 percent of the overall operating cost structure.

ROAD FREIGHT COST INDEX – GLOBAL



With the ongoing geopolitical crisis, shippers can expect an increase of around 3–5 percent in their road freight operating costs in 2024 across major geographies, such as North America, Europe, and Asia, except for LATAM, where an increase of close to 20 percent is expected.

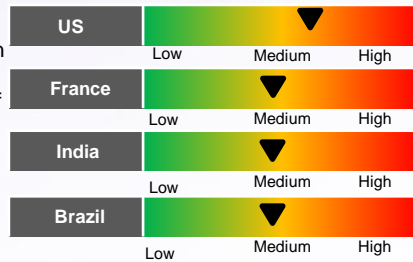
FREIGHT INDEX INCREASE BY REGION

Road Freight Operating Cost Index (Y-o-Y % Change)		
Region	2023 vs. 2022	2024 F vs. 2023
North America	1–2% (-)	2–3% (+)
Europe	2–3% (-)	2–3% (+)
Latin America	60–65% (+)	20–24% (+)
Asia-Pacific	0.5–1.5% (-)	2–3% (+)

AVAILABILITY: MARKET TIGHTNESS

2023 & 2024

- US: Truck orders in the US remained elevated in the second half of 2023, peaking in September. Sustained high levels persisted until the end of the year, leading to a quarter-on-quarter increase of 52.03% in Q4, despite a decrease in December due to which capacity constraints remained minimal during this period.



- “Class 8” truck orders witnessed a steep decrease of nearly 27 to 28 percent in December 2023 (M-o-M) in North America. While demand patterns continue to mirror seasonality and consistently lag available supply, a portion of this supply is anticipated to be for replacement in the year 2024.

TRENDS IN THE US, ASIA, AND EU COUNTRIES

US: In mid-December, the US Load to Truck ratio dipped to 1.72 but exhibited a recovery in the last week, reaching an average LTR of 1.93, driven by festive load demand. Also, the US manufacturing sector continued to contract, characterized by declining output and an accelerated downturn in new orders compared to 2022.

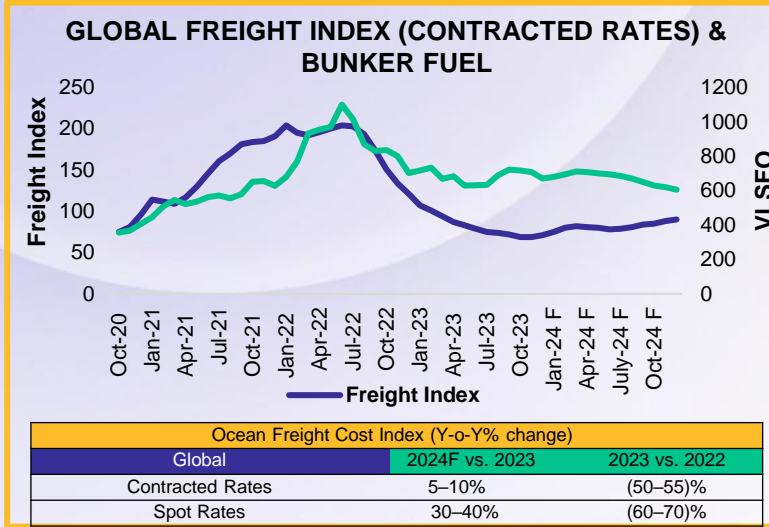
Asia: The manufacturing PMI is estimated to improve at a slower pace from Q1 2024, microeconomic factors such as improving domestic demand, and recovery in the housing and construction sector will all be the major priority for the government for H1 2024. Road freight demand is forecasted to be positive in the coming months of 2024.

Europe: Declining demand has made the spot and contract rates decrease in Q2 2023. However, the rates remained elevated, due to high energy prices and a persistent driver shortage problem in the EU. The spot index declined by 3.5 points quarter-on-quarter, down to 126.3 points in Q2 2023. The spot rates have decreased 1.5 times faster than contract rates, on an average, in Q2 2023.

INDUSTRY OUTLOOK/UPDATES

- Truckers from Poland, Hungary and Slovakia went on a strike against the preferential treatment given to Ukrainian truckers. The special permit granted to Ukrainian truckers has been extended till June 2024, sparking concerns about competitiveness, loss of business. Polish truckers have blocked border posts of Dorohusk, Zahony and Hrebenne. This has resulted in extreme delays in freight transport and increased costs.
- In 2024, there is a possibility that shippers may continue to face higher transportation costs, due to high uncertainty in the red sea conflict situation. As a major oil-producing region, it can impact operating costs and contribute to fueling inflation.
- Cargo truck wait times at the port of entry in Texas, have soared since announcement of the temporary partial closure of the border crossing on Nov. 27. amid a new migrant surge in the area. Rebalancing supply chains and the U.S. focus on increasing trade with Mexico face hurdles as daily freight volumes have decreased by up to 50% due to inspections. Average cargo truck wait times have increased from 30 minutes to two hours, impacting lead times for products such as poultry meat imports from Mexico into the U.S.

Logistics – Ocean Freight (Container)



SUPPLY-DEMAND DRIVERS

Supply: As the situation around the Red Sea has intensified, shippers are expected to face the brunt of higher freight rates as carriers are diverting the vessels through the alternative longer route via the Cape of Good Hope which has increased the transit days significantly.

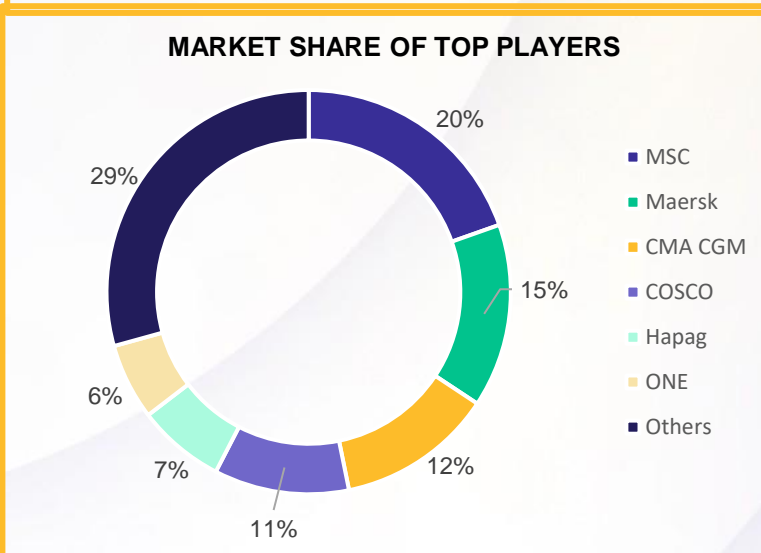
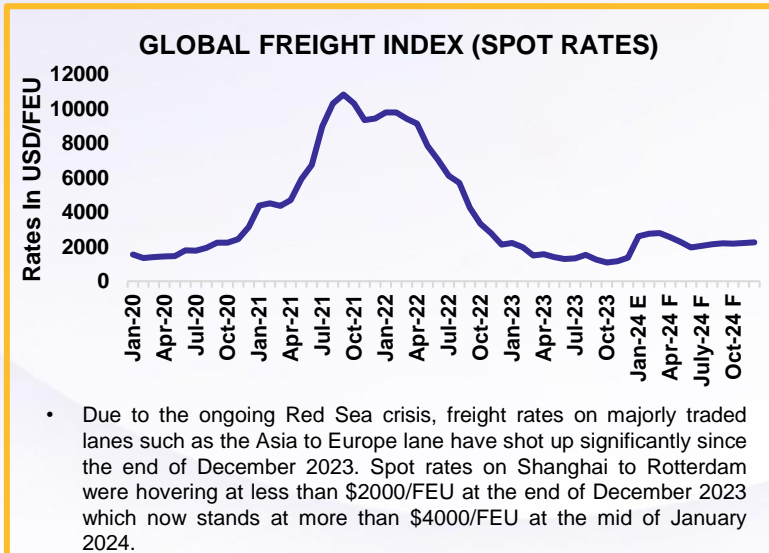
Due to favorable weather conditions, the Panama Canal authorities have announced it would increase the daily vessel transit limit to 24 starting from Jan 2024, this will ease the pressure off the supply chains moving shipments majorly between Asia to North America East Coast and LATAM to North America and Europe.

Demand: Flexport has advised, that retailers had reported excess inventories during Q12023 and only a few had the balanced amount. However, on November 23 majority of the retailers had advised balanced inventory and only 30 percent reported excess inventories, which indicates demand has begun to normalize on major trades and the market can expect seasonality trends to continue next year

COST DRIVERS: OCEAN PRICE TREND

Bunker Fuel Costs & Trends:

- Bunker prices which were following a downward trend during the first two weeks of December 2023 have started to climb up since then due to the ongoing Red Sea issue which has led to an increase in bunker demand.
- Maersk has announced a long-term off-take agreement with Chinese Goldwing for methanol supplies at a large scale. The Chinese developer will produce an annual volume of 0.5 million tons which will be the largest agreement to date for the shipping giant for procuring methanol supplies.
- The total volumes will combine a mix of green bio-methanol and e-methanol, which will be produced by utilizing wind energy at the new facility in northeast China starting in 2026.



INDUSTRY EVENTS/UPDATES

- Ocean carriers operating on the Asia to Europe trade lane have announced multiple surcharges and have declared force majeure on the bill of lading due to transit disruptions around the Red Sea region. This rate increase is likely to be spread to the transpacific and trans-Atlantic trade routes as well.
- Industrial Action by Maritime Union members at DP World terminals in Australia continues to pose challenges to the shippers as productivity at ports is severely impacted.
- Threat of labour strikes on the US East Coast during October 2024 is likely to have a major impact on the shippers as the current labour contract between the United States Maritime Alliance (USMX) which represents 70,000 workers across 36 US East and Gulf ports and the International Longshoremen's Association is set to expire on 30th September.

Logistics – Warehousing Services

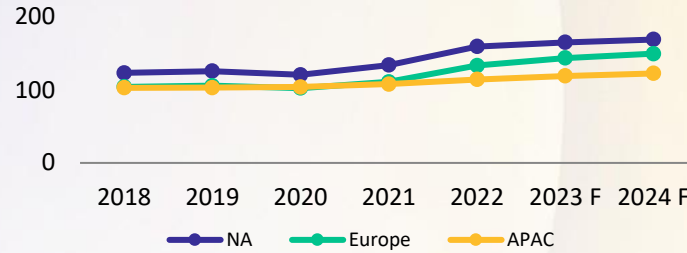
SUPPLY MOVEMENT – GLOBAL

Quarter	North America	Latin America	Europe	Asia-Pacific
2024 F vs. 2023 E	↑	↑	↑	↑

DEMAND MOVEMENT – GLOBAL

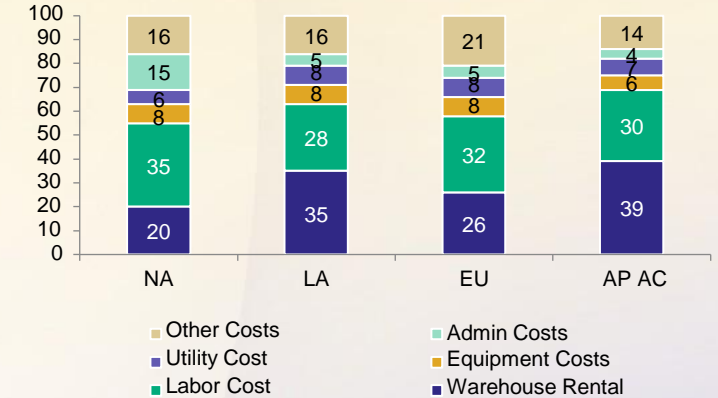
Quarter	North American	Latin America	Europe	Asia-Pacific
2024 F vs. 2023 E	↑	↑	↑	↑

WAREHOUSE COST INDEX – PPI TREND

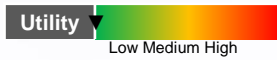
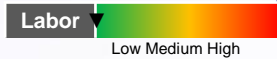
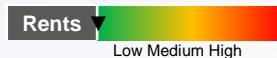


Region	2023 F vs. 2022	2024 F vs. 2023 F
North America	3–4%	2–3%
Europe	7–8%	3–4%
Asia-Pacific	4–5%	2–3%

WAREHOUSING GLOBAL COST STRUCTURE – 2023E



MAJOR COST DRIVERS



- Rent:** Demand for premium logistics facility and increasing need for space from 3PL and e-commerce sector is expected to boost the rents by 2–3 percent for North America, 3–5 percent for Europe, and 2–4 percent for Asia-Pacific, respectively, for 2024

- Labor:** High inflation rates and demand for skilled labors are expected to keep the logistics wage elevated for 2024 in all major economies by 5–10 percent

- Utility:** The government regulations and The Energy Bills Discount Schemes providing some relief to public on utility rates are projected to support the consumers to avoid a very high price increase rates for 2024. The UK market saw an increase of 12–13 percent, Brazil by 15 percent, and Mexico by 8 percent, respectively, for 2023

WAREHOUSE INDUSTRY TRENDS

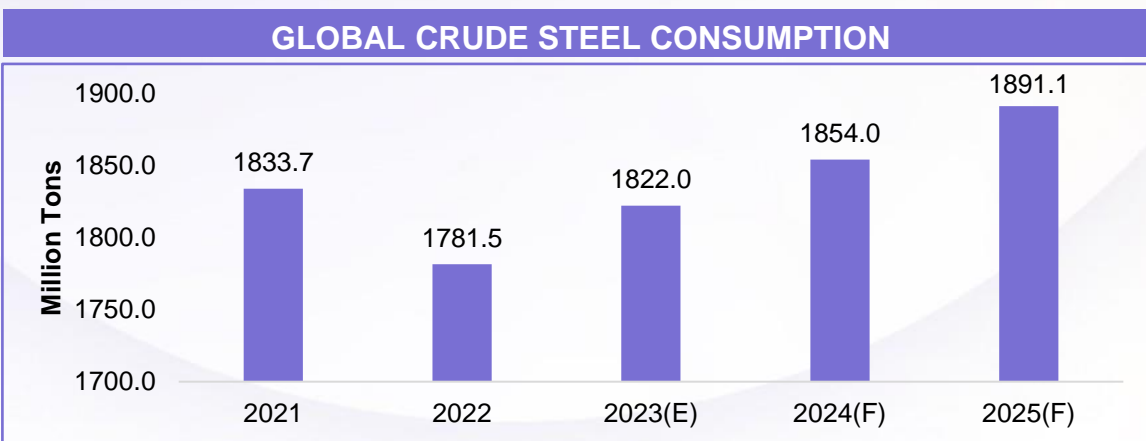
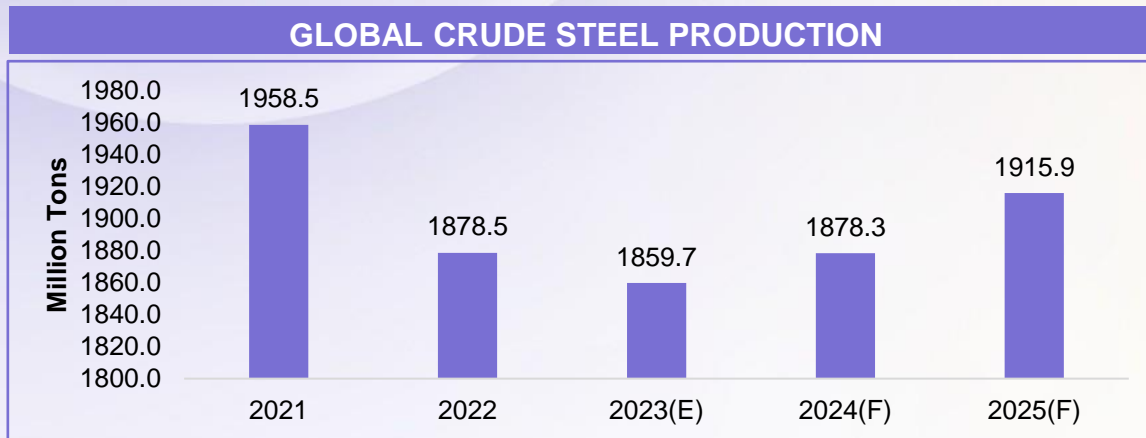
- Germany:** The ongoing scarcity in supply has resulted in a consistent increase in rental rates throughout the year. This is projected to lead to a 5–6 percent rental rate increase for 2023. With the return of more vigorous economic growth, the logistics sector is anticipated to gain further momentum in the latter half of the year. The rental price level is expected to persistently climb, likely around 4–5 percent, for 2024 due to the persistent supply shortage and the growing emphasis on environmental, social, and governance (ESG) standards
- France:** The limited availability of land, coupled with inflation, remains a driving force behind the rising rental rates. It is anticipated that this will lead to a 3–4 percent increase in rents for 2024. Furthermore, factors like escalating construction and land costs, financial expenses, and imbalances in supply and demand are expected to contribute to a similar 3–4 percent increase in rents for new properties in 2024
- US:** The demand for industrial space in the US has notably decreased. This decline can be attributed to two main factors, like the winding down of the goods boom that occurred during the pandemic and the anticipation of slower economic conditions by businesses. Despite a continuous moderation in absorption totals over the past four quarters, there is still a positive net growth trend. The festive season is expected to drive the demand in Q4 2023 and rents to increase by 2–3 percent for 2024



MINING & METALS

Carbon Steel – Global Market Overview

- The steel production market is expected to grow at a moderate 0–2 percent CAGR during 2022–2025
- In 2022, the supply chains were highly disrupted, due to the onset of the Russia–Ukraine war in the earlier part of 2022. Although the disruption levels have reduced in the latter half, the negative macroeconomic sentiments persist. Overall, for 2023, the outlook is highly uncertain on rising inflation and the possibility of a recession, constraints to energy supplies, etc.



KEY INSIGHTS

SUPPLY DYNAMICS

- The world's crude steel production was 150 million tons (Mt) in October 2023, which was stable compared to last year
- China's Iron and Steel Association (CISA) estimated that the country's daily crude steel output averaged 2.58 million tons/day over November 21st–30th, rising by 1.7 percent from mid-November

DEMAND DYNAMICS

- The steel demand is expected to grow marginally at a CAGR of 1–2 percent from 2022 to 2025. Majority of steel demand stems from the construction & infrastructure segment, equipment, and automotive sectors. Most of the demand from the mechanical equipment segment is expected to remain stable
- The automotive sector is one of the key end-use consumers of steel, and the growth in the EV segment is likely to boost the steel demand. The EVs could require up to 280 kg of additional steel compared to their IC engine counterpart. It is anticipated that EVs will make up a quarter of all new car sales in the next few years and the segment is rapidly expanding. This potential rise in demand would translate into upward pressure on steel prices in the long run by 2025



Carbon Steel – Price Overview

PRICE FORECAST – 2024

Month	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	June 2024	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024
US HRC (\$/MT)	1,124	1,146	1,157	1,105	1,055	1,029	999	984	974	986	1,011	995
Europe HRC (\$/MT)	762	788	773	758	751	761	763	749	730	744	763	744
China HRC (\$/MT)	577	586	591	575	543	530	546	533	546	563	583	571

PRICE OUTLOOK: US

- In November, the prices reached a five-month high and averaged at about \$1,018.97/MT. The prices surged by 24.2 percent m-o-m as compared to last month, due to extended lead times and limited availability of the material in the spot markets
- The import prices of steel HRC ddp Houston increased by 21.17 percent on a monthly basis
- Most of the buyers were expecting prices to plummet when the UAW Union went of strike, but as it did not happen, most of the buyers were caught off guard and were in a rush to restock before the prices increased further

SHORT-TERM OUTLOOK:

- Over the short term, the prices are expected to increase. The prices are expected to hit a six-month high in December and maintain an uptrend until the end of Q1 2024. The increase in raw material prices, like scrap, is expected to support the price incline
- Major mills in the US markets are expected to retain their higher offer prices, citing limited availability in the spot markets. Moreover, the lead times are expected to extend until 6–9 weeks

PRICE OUTLOOK: CHINA

- In November, the domestic HRC prices in China increased and recorded a six-month high. The prices increased by 8.04 percent m-o-m and averaged at about \$555.69/MT. The prices increased, amid increasing raw material costs (iron ore) and lingering expectations of stimulus packages
- During the first 10 days of November, the daily average crude steel output of members belonging to the China Iron & Steel Association (CISA) registered a 2.43 percent increase compared to late October, reaching 1.97 million tons

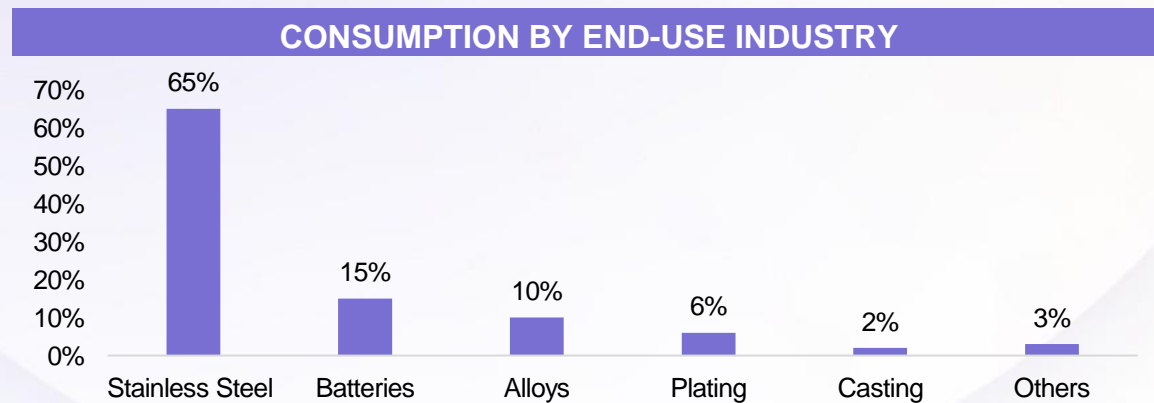
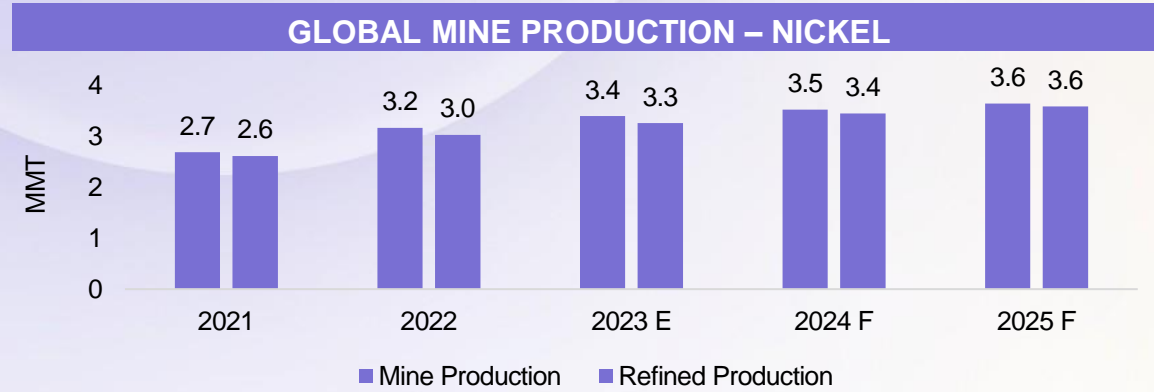
SHORT-TERM OUTLOOK:

- In the short term, the prices of Hot Rolled Coil (HRC) material in the domestic Chinese market are anticipated to rise, due to increased restocking and improved market sentiments. The positive shift in market sentiments is driven by expectations of stimulus packages that would benefit the construction industry. However, the sustainability of higher price levels remains uncertain, given the current market's supply surplus. Steel mills are expected to maintain production without implementing cuts, except for scheduled maintenance



Nickel – Global Market Overview

- Global mined nickel production in H1 2023 was 13.4 percent higher y-o-y, primarily due to new supply from Indonesia, where mined output grew by 26 percent over the period. Refined nickel consumption in H1 2023 was 2.4 percent higher y-o-y. Despite declines in all other major markets, nickel usage in China rebounded by 12 percent y-o-y. While China’s economic reopening remains weaker than expected in 2023, Chinese nickel consumption has risen due to an increase in stainless steel production and higher electric vehicle production



KEY INSIGHTS

SUPPLY MARKET DYNAMICS

- Global nickel mining is set to skyrocket by 7% in 2024, with Indonesia taking the lead. This surge is expected to outpace demand, potentially creating a surplus. Indonesia will continue to lead the global mined production growth. They'll be churning out over 70% of the world's nickel in the next few years.

MARKET OUTLOOK

- When compared to 2022, nickel usage increased by about 12% in 2023. Soaring EV demand for high-nickel batteries is predicted to drive nickel demand in 2024, potentially surpassing the expected supply surplus and driving up prices. A slowing economy may weaken demand in this traditional nickel sector (stainless steel), putting downward pressure on prices.
- More than half of the increase is from nickel pig iron production, with nickel sulfate making up a third of the production increase. EV adoption is expected to continue its meteoric rise, pushing nickel sulphate demand even higher in 2024. Indonesia's production juggernaut is expected to hit full stride, potentially bringing supply closer to demand. Environmental and social concerns surrounding nickel mining and processing could influence market sentiment.



Nickel – Price Overview

PRICE FORECAST - 2024

Month	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	June 2024	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024
LME (\$/MT)	16,495	16,776	16,494	16,692	16,949	17,225	17,628	17,958	18,335	18,069	17,881	18,228

LME MARKET INSIGHTS

- According to the International Nickel Study Group, the global refined nickel market had a monthly surplus of 23,900 tons in September, and the cumulative excess rose to 155,000 tons in the first nine months of 2023. Since Q3 2023, nickel price has been declining, and it has now dropped to a level not seen since June 2021. Because there is little demand in a market with plenty of supply, nickel prices are dropping quickly. The purchasers are concentrated on long-term markets; there is no new spot action in the US, China, or Europe
- Inventory level of nickel at LME warehouse decreased by around 0.3 percent and averaged at 43,515 metric tons for November 2023, compared to 43,572 metric tons for October 2023. The LME warehouse's nickel stocks dropped by nearly 14.4 percent y-o-y as of November 2023, from 50,815 metric ton in November 2022

SHORT-TERM OUTLOOK:

- Nickel inventories have increased in LME and SHFE. With winter holidays, there is a drop in demand from end-use sector stainless steel, the nickel prices are expected to drop, as the buyers are full of their inventory and abundant supply helps in refilling whenever necessary. Despite the overwhelmingly bearish sentiment in nickel, it is expected a year-end short squeeze event could emerge if the LME nickel prices start rising again. The demand for nickel has been weak, particularly due to flatlining electric vehicle (EV) demand

LME MARKET INSIGHTS

MEDIUM-TERM OUTLOOK:

- The demand is expected to rise because many smelters would need to replenish after using their stockpiled inventories. Over supply is expected to be offset by rising demand in 2024. The stainless-steel production is expected to rise with a rise in construction and automobile industries. Nickel prices have bottomed out and are expected to recover to some extent. The immediate challenges of a surplus in the market and subdued demand are offset by nickel's enduring role in the green energy transition, especially in the EV sector

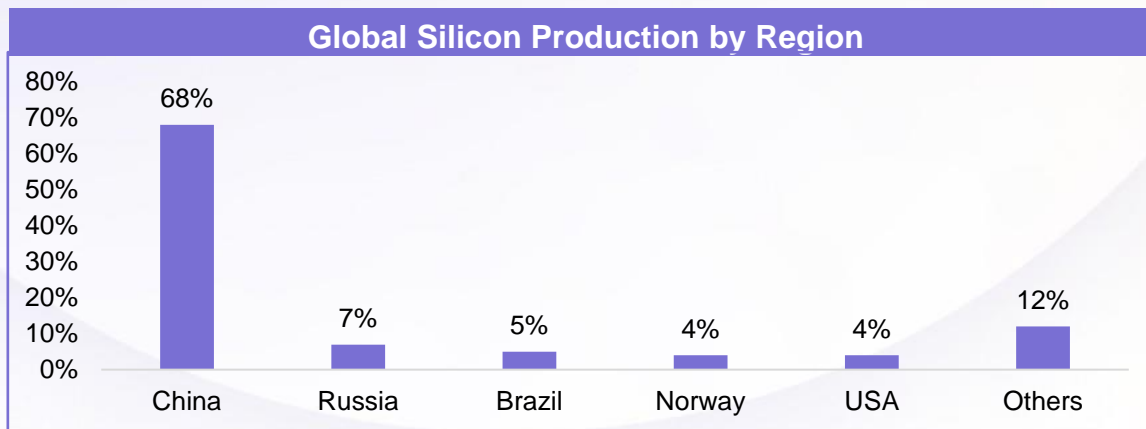
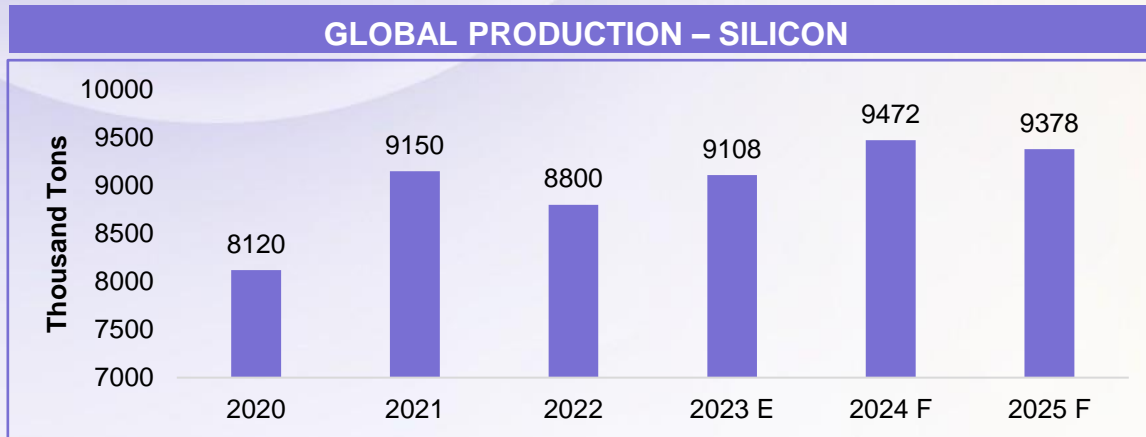
LONG-TERM OUTLOOK:

- Nickel prices are expected to rise, as stainless- steel demand rises in the industrial, oil and gas, and construction sectors. Uncertainties cloud the 2024 outlook, due to variables, such as geopolitical shifts and evolving economies, contributing to a challenging prediction landscape for the Nickel market. As the world pivots towards sustainable energy solutions, nickel's importance as a key green metal is set to support its resilience. EV demand is debatable, as battery chemistry might change from NMC [nickel, manganese, cobalt] and depend on other alternatives, like lithium ion or hydrogen



Silicon Metal – Global Market Overview

- Global silicon production is expected to increase at a CAGR of about 2.5–3 percent during 2023–2026. The global production is expected to be dominated by the Asia-Pacific, with China being the key silicon metal producer



KEY INSIGHTS

SUPPLY MARKET DYNAMICS

- The increasing demand for the material from manufacturers of aluminum alloy and polysilicon is expected to drive the demand for the material. China is expected to remain the largest player in the silicon supply market during the forecast years
- Since early September, the Chinese government has cut the property purchase threshold for out-of-town residents and lowered mortgage interest rates for their first homes. Reduced interest costs are advantageous for increasing investment and consumption. The easing of property purchase regulations in a number of cities, notably Beijing and Shanghai, has resulted in a bullish property market

MARKET OUTLOOK

- The major consumers of silicon metal are expected to be aluminum alloy producers and manufacturers of silicones during 2024
- Rising metal prices, owing to strong downstream demand for the metal, are anticipated to boost the silicon metal market growth in the long term. In addition, anticipated improvement in the supply of semiconductors could further increase automobile production, propelling the demand for silicon from aluminum alloy suppliers



Silicon – Price Overview

PRICE FORECAST - 2024

Month	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	June 2024	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024
US (\$/MT)	2,978	2,978	3,008	3,083	3,063	3,053	3,028	3,058	3,058	3,048	3,015	2,990
Europe (€/MT)	2,084	2,128	2,139	2,132	2,111	2,066	2,054	2,070	2,095	2,148	2,134	2,117

PRICE OUTLOOK: US

- Silicon prices in the US declined significantly by around 3 percent during November 2023 month-on-month and averaged at \$3,004/MT. It can be noted that the quarter-on-quarter average price movement in Q4 2023 vs. Q3 2023 has also decreased significantly by almost 14 percent
- Current mainstream prices of silicon metal 5-5-3 in the US fell for the month, due to overstock and gloomy supplier sentiments towards the forecast, despite increasing spot market orders for Q1 2024

SHORT-TERM OUTLOOK:

- In line with market oversupply, it is anticipated that mainstream prices of silicon metal 5-5-3 in the US are expected to decrease in the immediate term. As a result of the negative market sentiments towards the short-term outlook and the excess in the US, several dealers reduced prices to obtain orders in Q1 2024

PRICE OUTLOOK: EUROPE

- The prices in Europe witnessed a sharp increase by 4 percent in November. Despite sluggish market demand sentiments, the price of silicon metal increased in Europe, owing to high production cost during the month
- Silicon 5-5-3 prices have risen, as market participants report an increase in China and higher pricing in Europe due to higher input costs. Silicon 5-5-3 prices increased marginally, as higher Chinese pricing continued to enter the European market

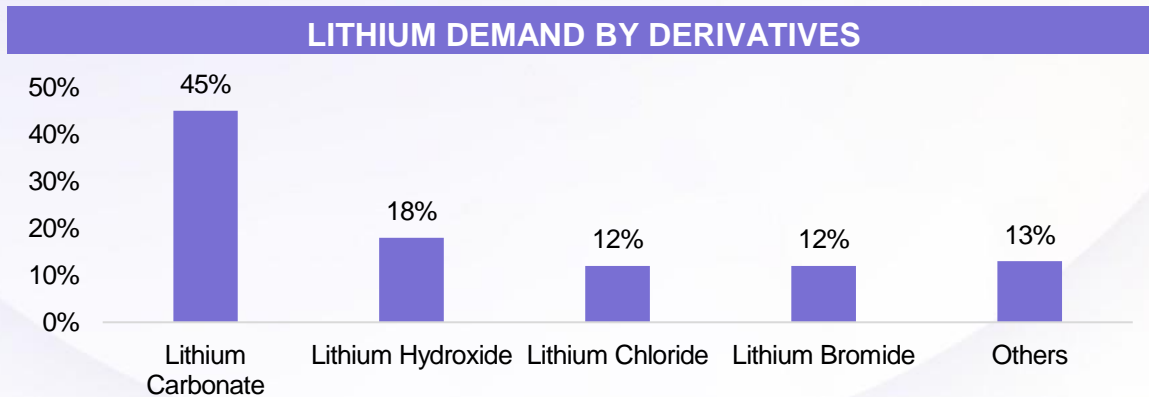
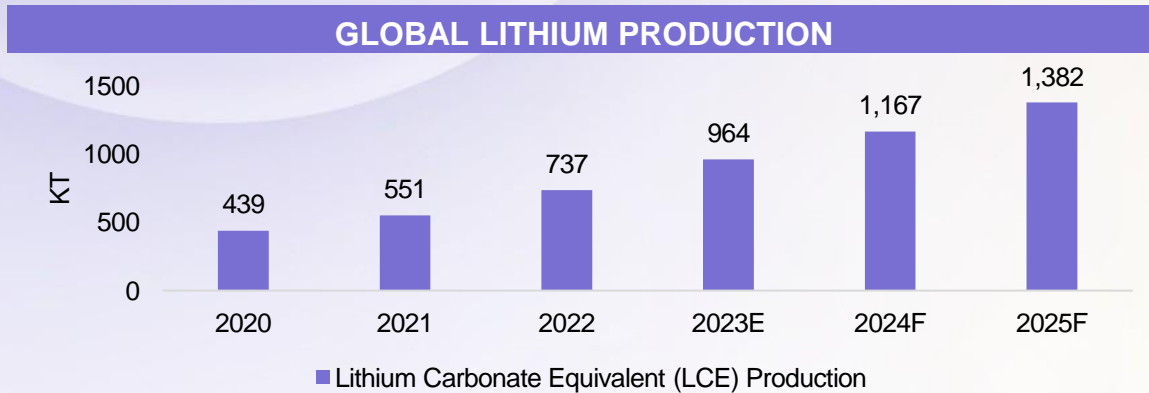
SHORT-TERM OUTLOOK:

- Rising interest rates are driving down the market prices for silicon metal and ferro-silicon, which puts pressure on demand and presents an increasingly difficult operating climate for European producers. The demand from aluminum plants for silicon metal is anticipated to remain supported during Q1 2024, and therefore, the price is expected to increase by 0–4 percent for the short term, owing to the expected increase in production cost



Lithium – Global Market Overview

Global Lithium Carbonate Equivalent output was 737Kt in 2022 and is expected to reach 964Kt in 2023. Lithium supply is likely to lag lithium demand through the first half of the decade. Notable lithium mining capacity is set to come online in late 2023 and early 2024 to be met by gains in output by Australia, Chile (via expansions to SQM and Albemarle brine operations) and Argentina (via new and expanded brine operations by Allkem, Livent and Minera Exar). Over the forecast period, key sources of added supply include China, Brazil, Canada, DRC, Mali, and Zimbabwe.



KEY INSIGHTS

SUPPLY MARKET DYNAMICS

- Increased extraction of lithium resources reflects higher production across all major producer nations, as well as the emergence of several new, smaller producers. Higher production is partly in response to lithium prices recovering in 2021 and surpassing record levels in 2022

MARKET OUTLOOK

- Demand continues to grow rapidly, driven by surging demand for EV batteries. Demand for lithium batteries accounted for almost 80 percent of all lithium consumption in 2022. This is expected to reach 90 percent by the end of the outlook period, as EVs gain market share in the world passenger car market. Global sales of all types of passenger-EVs rose by more than 40 percent in 2022, with growth in the Chinese market, accounting for around three quarters of global growth. Growth in sales in other markets, including in Europe and North America, also increased
- Tax incentives and government subsidies continue to support purchases of new energy vehicles and several local governments — such as Shenzhen, Shandong, and Hubei have also provided subsidies and incentives to encourage EV purchases



Lithium – Price Overview

PRICE FORECAST - 2024

Month	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	June 2024	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024
China RMB/'000 MT	127.1	129.5	128.9	125.1	122.8	126.5	126.1	125.5	126.7	131.1	137.7	146.6

MARKET INSIGHTS

- Lithium carbonate prices are under pressure because of increased supplies and lower demand. Negotiations for 2024-term contracts are ongoing among many producers and consumers, resulting in fewer spot market deals being finalized
- Consumers are minimizing purchases at the year-end to prevent excess inventory for better financial reports. Some lithium sellers are eager to destock, lowering their offers, amid inventory pressure
- Despite competitive pricing, actual deals are challenging, due to muted demand. This dynamics is contributing to downward pressure on spot lithium prices

SHORT-TERM OUTLOOK:

- Lithium carbonate consumers are avoiding spot purchases to prevent excess inventory buildup towards the year-end
- Ample lithium market supplies following output increase globally, mainly in Africa and Australia, which is likely to depress the prices further
- Overall market sentiment is pessimistic, as many believe that lithium demand will not recover in the short term. The prevailing downtrend in lithium prices and weak demand are expected to persist at least into Q1 2024

MARKET INSIGHTS

MEDIUM-TERM OUTLOOK:

- Lithium producers with significant long-term contracts are less inclined to decrease spot prices in the face of slow demand. Conversely, those with a smaller share of production secured by such agreements feel more pressure and are taking a more assertive stance in lowering their spot prices
- Most of the downstream sector will conclude the long-term lithium supply deal by early Q1 2024; therefore, spot procurement on hand-to-mouth basis is anticipated to slightly impact the lithium market
- Any strong recovery in demand is anticipated to influence the price points in the medium term

LONG-TERM OUTLOOK:

- As per lithium miner, Albemarle, Chinese lithium demand is likely to reach about 1391.00 KT LCE from FY 2023 to FY 2025. With regards to global lithium demand, it is expected to reach 3.70 MMT LCE in 2030, 15.00 percent up from its earlier forecast, owing to robust demand from the EV sector
- Time period of above 10 years for new lithium project development would result in shortage of 500.00 KT LCE by FY 2030
- China's lithium demand from the E sector alone is assessed to record an annual rate of 20.00 percent over the next decade, far overtaking the supply





ENERGY

Natural Gas – Global Market Overview

Global gas demand is predicted to climb by more than 8–10 percent over the next five years, reaching more than 4.3 trillion cubic meters in 2024 according to the International Energy Agency. As of 2025, the world's natural gas demand is predicted to exceed 4 370 billion cubic meters annually, indicating an average annual growth rate of 1.5 percent for the 2019–25 period. Global LNG demand is expected to be 3 percent higher in winter 2024-25 than last year. Higher stockpile requirements in Japan and South Korea, ongoing expansion in emerging Asia, and increased imports to Europe will keep the momentum going.

GLOBAL DEMAND OF NATURAL GAS (bcm)



KEY INSIGHTS

DEMAND OUTLOOK

- The demand for natural gas is expected to rise globally in 2024, as a result of climatic situations that can foster resilience, security, and economic progress. The global energy system can be made cleaner with the use of natural gas. However, it encounters its challenges, including maintaining price competitiveness in new markets and lowering methane emissions, along the natural gas supply chain
- In the upcoming years, the Asia-Pacific area will account for more than half of the incremental worldwide petrol consumption, mostly due to the growth of petrol in China and India. New Asian players, such as Bangladesh, India, and Pakistan, would look to import more of the fuel

DEMAND SEGMENTATION

- In the US, external export demand is further expected to decrease post-winter (March 2024), which will help stabilize US natural gas prices. High-interest rates and recessionary pressures are further expected to negatively impact the overall consumption, especially from the industrial sector. In the EU, uncertainty over gas storage sites, witnessing capacity levels similar to 2023, can provide a relative premium to natural gas prices. China is stockpiling liquefied natural gas for winter, returning to the spot market in a move that could reduce supply to other importers

PRICE OUTLOOK

- Strong winter can increase the prices of gas, due to high demand from heating applications in the near term. In North America, the US natural gas prices are expected to stabilize around \$2.5–3.5/MMBtu in 2024, as supply levels are restored with the consumption rate declining. In Europe, the prices of natural gas are expected to range between €25/MWh and €45/MWh with a stable natural gas supply and diversification of natural gas and energy portfolios. Supply levels are expected to stabilize post any risk of disruption in winter



Electricity – Global Market Overview

- The consequences of the Russia–Ukraine conflict lasted in 2023 as well, with various regions experiencing economic slowdowns and advanced economies experiencing sharp drops in electricity demand. Power supply risk has reduced in the recent months because of excess solar and wind generation, and solar has compensated for other supply during the day. High gas inventory levels and low gas prices have made it a cost-effective fuel for power generation compared to 2022
- The wholesale electricity prices in the major markets fell significantly in 2023, they did not return to pre-Covid levels

GLOBAL DEMAND OF ELECTRICITY (TWh)



KEY INSIGHTS

DEMAND OUTLOOK

- The global electricity demand could increase by 2–3 percent in 2024. The significant decline in demand in advanced economies contrast sharply with the growth seen in emerging economies, such as China and India. China's electricity demand is expected to rise by 5–6 percent in 2024, while India's annual growth rate is expected to be 6–7 percent
- Prohibition of new installations of household heaters that use heating oil or natural gas beginning in 2024, forcing many households to switch to heat pumps powered by electricity in EU nations, like Germany. Regulations to reduce emissions from trucks and buses are being developed, which would increase the electricity demand significantly in the European regions

RENEWABLE ENERGY GENERATION

- If weather conditions are favorable, the accelerated pace of new renewable capacity additions indicates that renewable generation could surpass coal as early as 2024. Annual solar PV market growth is expected to continue, reaching nearly 310 GW in 2024, a more than 7 percent increase over 2023. Lower module prices, increased adoption of distributed PV systems, and a policy push for large-scale deployment all contribute to higher annual additions in all major markets, including China, the European Union, the US, and India

PRICE OUTLOOK

- In the US, average prices are expected to change by 1–2 percent in 2024 compared to 2023 values. Reduction in wholesale electricity prices, primarily because of lower natural gas prices in 2023, should support retail industrial prices in 2024
- Wholesale power prices are expected to stay high with a 5–10 percent change from the current prices in Europe, owing to higher renewable generation dependency. Negative prices suggest that generation is not flexible, demand is inadequately price-responsive, or there is insufficient storage to execute energy arbitrage



PACKAGING

Inflation Forecast – Packaging

CORRUGATES SUMMARY

The North American market faces the increased cost of production and declining profit margins; and to prevent losses, major suppliers have announced price increases in early 2024. In Latin America, increased supply and stable demand will insulate containerboard prices from dynamic price movements. In the European markets, balanced market dynamics is expected, as significant demand recovery is not expected, leading to stable prices. In Asia, over the long term, with the economic rebound in 2024, demand is expected to increase for containerboard and the additional capacity infused into the market, which will keep prices stable in 2024.

OVERALL CATEGORY RISK (CORRUGATED PACKAGING)	Favorable
INFLATION (2023 vs. 2022)	-(15–16%)
EXPECTED INFLATION (2024 vs. 2023)	(2–3%)
INPUT COST (2024 vs. 2023)	(4-5%)
SUPPLY-DEMAND GAP (2024 vs. 2023)	(1–2%)
CATEGORY SUMMARY	<ul style="list-style-type: none"> Capacity expansions in global regions are expected to infuse additional supply in the market While the global demand rebound is expected in 2024, infused additional capacity will lead to balanced market conditions and insulate the market from steep price movements

KEY MARKET INSIGHTS

SUPPLY MARKET DYNAMICS

- Additional corrugated board capacity infusion is expected in global regions, especially in Asia and Latin America, due to significant capacity expansions by suppliers. In Asia, annual downtimes have been announced by some suppliers during the 2024 lunar New Year. However, suppliers, like Nine Dragons Paper, have announced expansions of around 1–2 MMT, which will infuse additional capacity and lead to a balanced market dynamics
- In most regions, increased demand for eco-friendly materials is putting pressure on suppliers to expand the range and add more recycled grades, leading to capacity expansions on the recycled grades

DEMAND MARKET DYNAMICS

- In 2024, global demand recovery is expected in most global regions after a demand slowdown in 2023. In the US, by the mid to end of 2024, there is an optimistic outlook for improved business confidence, leading to Innovation initiatives that are gaining momentum, signaling a commitment to long-term growth in demand levels
- In Latin America, demand increase is expected to be driven by agricultural segment growth, while Q3 and Q4 2024 are expected to witness peak demand growth, driven by retail and export demand. In Europe, while present consumption is low, demand rebound is expected in Q1 2024, driven by declining consumer price inflation in many European countries. In Asia, the anticipated economic rebound in 2024 is expected to drive increased demand for containerboard in mid- H1 2024





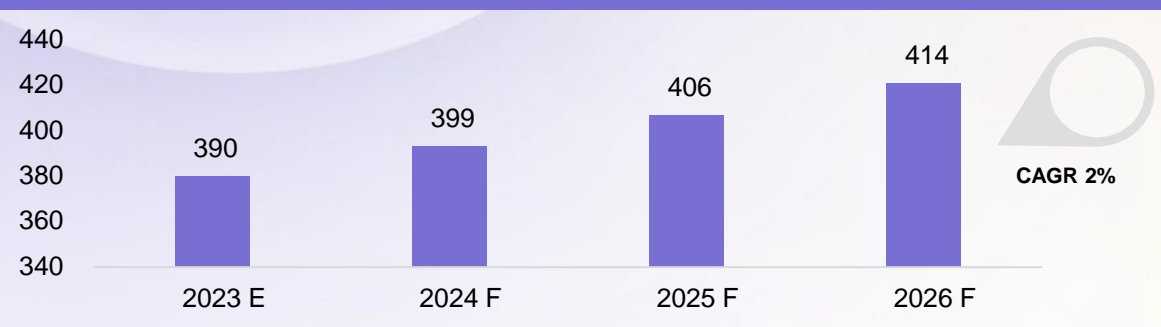
CONTACT CENTER

Contact Center Market Growth & Share

2024 Forecast

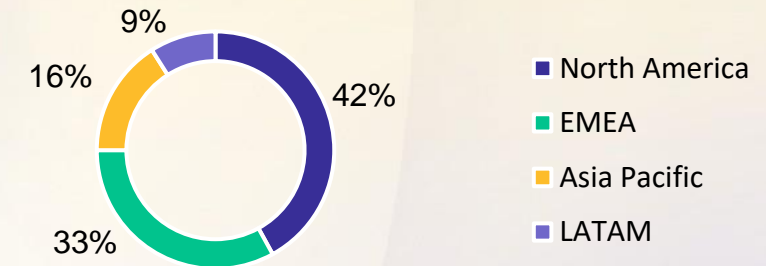
The industry is dominated by in-house contact centers. However, in the upcoming years, an outsourced contact center market will continue to extract a greater chunk of the overall pie of a contact center.

GLOBAL CONTACT CENTER SERVICES MARKET \$ BILLION (2024–2026F)



- The global contact center market was valued at \$390 billion in 2023 (E), of which, 75–70 percent of contact center services are kept in-house. The remaining 25–30 percent are outsourced to third parties. The share of outsourced CX market is growing at a rapid rate of +6 percent points in the past three years
- The overall contact centers market is forecasted to grow at a CAGR of nearly 1.5–2 percent to reach \$410–\$420 billion by 2026(F)

CONTACT CENTER SERVICES MARKET SHARE BY REGION (2024 F)



SUPPLY PERSPECTIVE

- India and the Philippines are the foremost countries in managing contact center, outsourcing demand. They will continue to maintain their top positions soon. Increase in labor costs and shortage of skilled labor are some of the supply side constraints, which may lead to an increase in CX costs. Companies are investing on technology and automation to mitigate long-term pricing risks

DEMAND PERSPECTIVE

- North America, Europe, the UK, Australia, and Japan are the leading buyers of customer care outsourcing services. Their share is projected to remain stable in the upcoming years. With changes in customer behavior, companies are looking for omnichannel contact centers delivering multi-channel service

Contact Center Market Trends 2024

Forecast

Service providers are improving their supply capability by expanding delivery locations and adding customer analytics & omnichannel solutions in their portfolios to offer better value to buyers over long-term contracts. The buyers are focusing on a symbiotic relationship with suppliers, where they could bring the maximum benefits and add more value to both the partners.

USAGE OF ANALYTICAL TOOLS, AI, AND CHATBOTS

- AI is essential in call centers to improve the customer experience and relieve human agents of time and energy spent on routine requests

ADOPTION OF GAIN SHARE PRICING MODEL

- Companies are engaging with contact center suppliers on a gain share model, where vendor's fees are tied to client's increased revenue or cost savings from their services

OMNI-CHANNEL STRATEGY

- The aggregation of data from all the business channels provides businesses a trove of data. Such data will help businesses make informed decisions and improve customer experience

FOCUS ON WORKFORCE & CUSTOMER EXPERIENCE

- Upskilling and reskilling: Training representatives to manage interactions across various channels, leverage emerging technologies, and deliver tailored services
- Prioritizing employee well-being: Emphasizing the significance of work-life balance, offering mental health assistance, and fostering positive workplace environments to attract and keep talented individuals
- Customer-centric metrics: Assessing achievements by considering customer satisfaction, resolution rates, and long-term value, rather than solely relying on call volume

HYBRID WORKING MODELS

- The share of work-from-home agents had reduced in 2023, there is a higher share compared to pre-pandemic levels and this model helps CX vendors in workforce management by recruiting offshore agents and giving flexibility to existing workforce

MULTILINGUAL HUBS

- Companies are offshoring their CX tasks to multilingual hubs that have cost advantages because of economies of scale. Hubs ideally are locations with educated, multicultural populations, where foreign-language talent is abundant and network connectivity is strong

ADOPTION OF CLOUD-BASED CONTACT CENTERS

- The growing need of the businesses to connect digitally and optimize cost has necessitated the growth of cloud-based contact centers that could be deployed in minutes with minimal capital investment

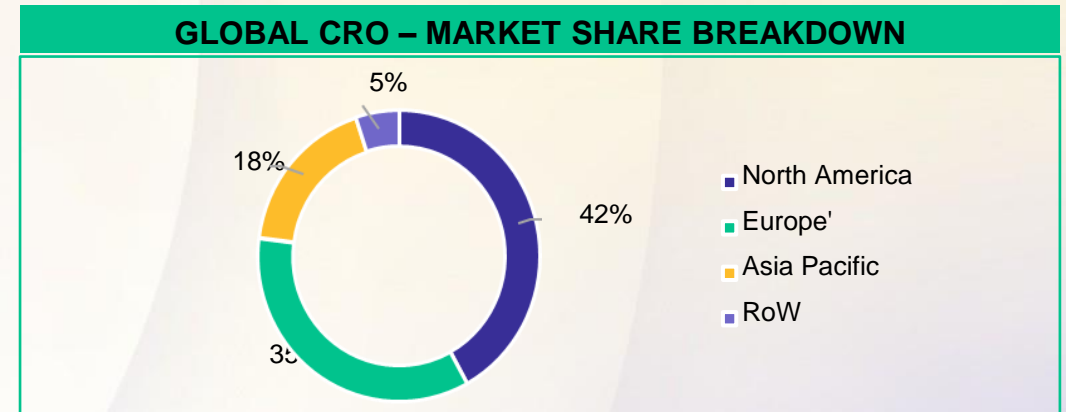




CLINICAL TRIAL CRO

Clinical Trials CRO Market Growth

- The global CRO market was estimated at \$46.7 billion in 2023E, and it is expected to grow at a CAGR of 6.8–7.2 percent to reach \$61 billion by 2027F
- This is due to the increased outsourcing by pharmaceutical and biotechnology companies, with 75 percent comprised by the clinical segment. The focus of CROs has shifted toward post-approval commercial offerings, owing to increased development in technology and data analysis



- North America and Europe hold almost 77 percent of the CRO market, with pharmaceuticals spending about 65 percent and 15 percent of their clinical trial R&D spending in these regions, respectively
- The spend on specialty focus, such as rare diseases, personalized medicines, and specialty oncology, has increased, the larger portfolio by spend size would continue to drive the CRO market
- Several pharmacy chains have entered clinical trial space, especially in the US, like Walmart, CVS Health, and Kroger Health
- Emerging markets, such as BRICS (Brazil, Russia, India, China, and South Africa), have seen increased outsourcing in the recent years
- Large molecule development outsourcing has increased from ~35 percent to 45 percent, due to more supply and availability of reliable single-use technology
- The increased focus of pharma on large molecule therapy, cell and gene therapy, rare diseases, specialty treatment, point of care assays, and personalized therapy & devices will require clinical trial testing and submission of data to the relevant regulatory authorities
- The depth of regulatory scrutiny has increased, such as early RWD collection and reporting every adverse events, driving increased clinical trials

Key Market Trends to Continue in 2024

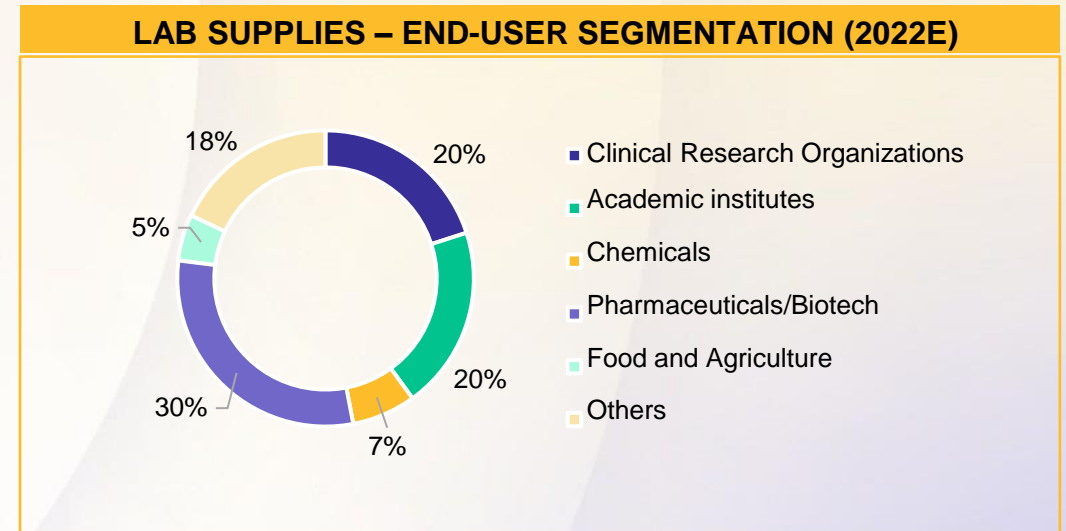
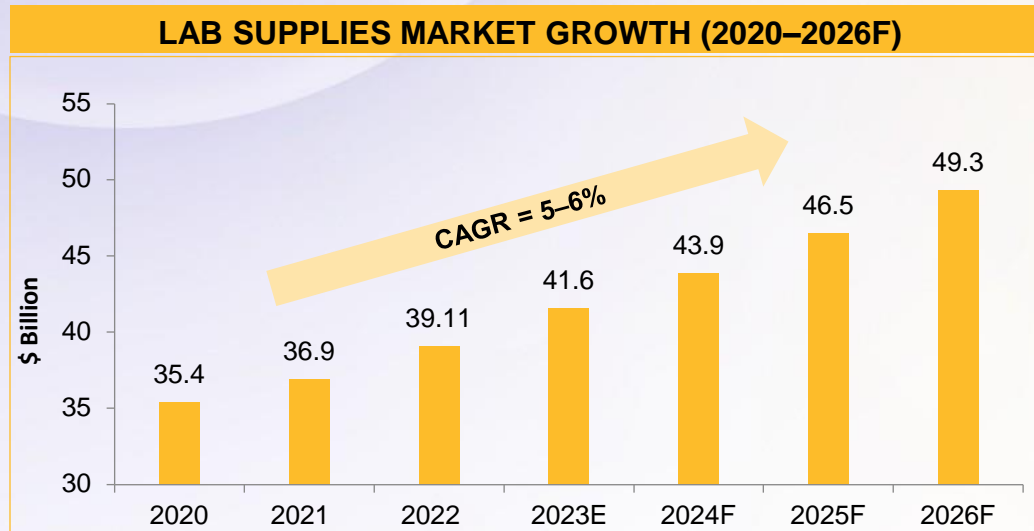
- Patient-centric approaches incorporating integrated technologies will continue to guide future trials and result in the adoption of virtual/decentralized approaches
- Clinical research is increasingly incorporating artificial intelligence (AI), depending more on digital technologies, like ePRO, and emphasizing the importance of patient advocacy groups

Patient-Centric Solutions	Transformative Potential of AI	Pharmacies Ramping up Trial Recruitment	Decentralized (and hybrid) Trials will become Normalized
<ul style="list-style-type: none"> • Virtual trials have led to increased adoption of patient-facing technologies to enhance patient enrollment and retention in clinical trials. Virtual patient consultation through telemedicine has gained traction as well • Patient-centric trial design has led to adoption of practices, such as Home Health Visits and direct-to-patient drug delivery. However, remote personnel and drug delivery require more lead time to setup, more extensive logistics, and certification planning. Thus, pharmaceuticals are currently exploring these methods to implement them in majority of trials 	<ul style="list-style-type: none"> • In 2024, artificial intelligence (AI) will advance and become more dependable in clinical trial applications, transforming participant recruitment, sample, and management practices as well as data collection, analysis, and reporting • Businesses will go one step further in 2024 and use AI to forecast, which trial participants are most likely to reap the benefits, follow the instructions, and stick with it through to the end • This may raise the standard of participant selection and produce better results • In order to improve procedures that consistently reach trial goals and optimize resource efficiency and patient centricity, sponsors will begin utilizing AI-based solutions 	<ul style="list-style-type: none"> • Walgreens demonstrated increasing pace in Q3 2023 by signing 15 contracts for clinical trial recruiting, up from 8 contracts in Q2.10 • We also see new companies entering the market in 2023, such as Kroger, which is presently hiring for two trials • ObvioHealth declared a global alliance with Chemist Warehouse, the biggest retail pharmacy in Australia • More pharma companies are expected to collaborate with these grocery and pharmacy giants in the coming year 	<ul style="list-style-type: none"> • DCTs have emerged as a viable choice for gathering necessary data and will likely continue to do so in the context of connected devices and wearables • This will improve patient convenience, increase access to trials, and decrease entry barriers • Recently, AstraZeneca announced the creation of Evinova, its own digital health solutions provider, in partnership with Fortrea and Parexel with the goal of "delivering clinical trials and better health outcomes • This new business will assist outside businesses in addition to AstraZeneca



Lab Supplies Market Growth and Share

- The lab consumable market occupies the largest segment in the research lab instrument and supplies market, with 8 percent CAGR driving the market
- This drives the need for additional supplies to cater to the growing needs of the R&D sector, and an increase in biological and chemical research is further expanding the market



- The major drivers in the industry are the growth of investments in the research sector and the demand increase for lab supplies. The constraints include the demand, price increase, and environment-friendly alternatives
- Impact of the crisis has increased regional demand. Pharmaceutical companies are looking to source internally from regional suppliers and keen on quality.
- Pharmaceutical/biotech companies constitute 30 percent of the overall demand for lab supplies. Suppliers view the pharmaceutical industry buyers, as core accounts with whom they are willing to engage in a strategic partnership and offer better options for technology updates and regular support
- End-users that conduct a high number of testing tend to rent equipment, owing to the high costs. However, they purchase the reagents/consumables that are required to run the tests, providing suppliers an opportunity to generate revenue through high quantity sales of reagents

Key Lab Supplies Market Trends to Continue in 2024

- The increase in M&A activities has led to higher digital procurement adoption and manufacturing capacity expansions. There is a shift in the industry that promises higher supply provisions that will meet the growing demand
- Niche vendors collaborating with technical suppliers' support in distribution channel expansions and global vendors, such as Thermo Fisher and Avantor's acquisitions, are helping to expand their technology expertise

PARTNERSHIPS AND ACQUISITIONS

- Global lab supplies companies are partnering with technology companies and seeking distribution-based support, in order to reach varied markets. This creates access to capabilities of the partner for new generation instrumentation, as well as a particular geography reach
- Partnerships in the industry also detail the need for merging/acquisition of CRO and global vendors to establish strength in providing one-stop solutions to trials and testing

USE OF DIGITAL SOLUTIONS

- Use of mobile apps and digital solutions for e-procurement have increased multifold owing to COVID-19. Vendors have started providing internal tools as well partnered for e-solutions. Japan and China are planning to introduce industrial robots in laboratories, which can disrupt the glassware market. The
 - US has still not shifted to robotic technology, even though they are less
 - economical, thereby increasing the use of glassware

FACILITY EXPANSION

- The recent growth of lab consumable demand has expanded the market. Vendors are expanding their facilities in multiple regions, in order to stay aligned with and cater to the growing need for supplies and consumables. The recent trend instantiates the need for PPE kits, which the vendors have increased their production of
- Global players are investing heavily on
 - the expansion, which will add more employees to the facility, and thus increase production

RECYCLING

- Sustainable options for recycling supplies have become the trend. Initiatives to reduce waste in labs are a focus. Vendors are looking to recycle their products on a larger scale
- These initiatives can produce long- term benefits in cost savings and bring about more environment-friendly products
- The growing popularity of small laboratory supplies, along with easy usage, will grow substantially in the industry. The convenience of the size of the equipment is in strengthening the growth of the supplies market



Lab Supplies Technology Trends

- The major tech innovation, including AI, LIMS, and robots, are said to enhance the turnaround time of repetitive tasks. This is possible through skilled human intervention in technology
- Innovations that include molecular biology products and robotic tips enable better solutions that support automation and bring about better efficiency in testing process

DIGITAL PROCUREMENT

- Pharmaceutical companies have started to adopt aggregated e-commerce solutions with fee for service model for their procurement, mainly owing to the ease in making optimized decisions. Identifying specific and rare products can be done faster and easier with online resources
- Many tools have entered the market to provide end-to-end solutions to labs/ pharmaceuticals and better manage their supply chains and inventory

COLD CHAIN AND IOT TECHNOLOGIES

- IoT devices form an important feature in connecting multiple devices for automating the lab process
- Cold-chain technology refers to temperature-controlled shipment and logistics
- Cold-chain-based IoT devices have built-in security. Multifactor authentication and encryption are increasingly common built-in features in such devices
- This is appropriate for specific supplies that are transported as critical ones

INDUSTRIAL ROBOTS

- The concept of intelligent robotic automation begins with the collection of data at multiple levels and aggregating them with data over multiple layers in order to generate better robots with greater efficiency
- Repetitive tasks are being slowly replaced by robots that can improve task accuracy and precision
- With an increase in genomic research and innovative next-generation sequencing robotic solutions, vendors such as Perfin-Elmer are innovating in this space with more automation supportive supplies

USE OF AI

- AI has been largely applied for routine work. Its benefits are logarithmically high. The immediate impact of adoption of AI is 16 percent on personnel cost
- Long-term strategies to integrate quality labs with blockchain and AI could reduce costs by over 38 percent. This reduction is due to the miniaturization of equipment, automation of complete lab process, and remote monitoring and reporting





RESINS & SOLVENTS

Global Resins Outlook (1/2)

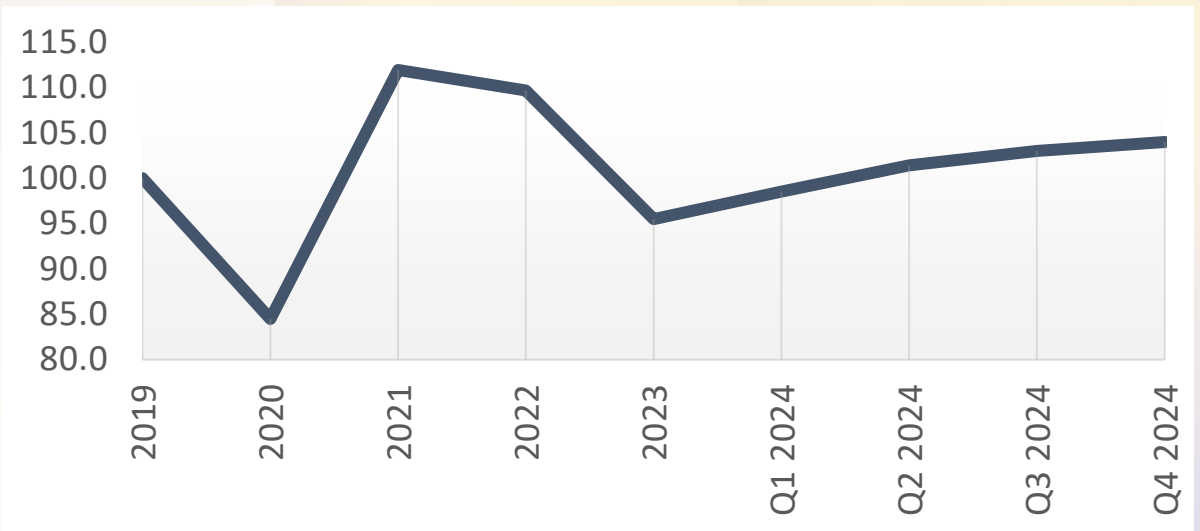
SUPPLY PROJECTIONS

PET POLYPROPYLENE POLYETHYLENE

Market Overview 2023

- Throughout 2023, the demand for resins experienced a persistent downturn, primarily influenced by a pessimistic economic outlook. Poor demand from downstream applications led several producers to reduce operating rates in polypropylene and polyethylene production units, resulting in narrow profit margins for producers
- In response to the challenging market conditions, Dow Chemicals announced a global 15 percent reduction in PE production, while LyondellBasell revealed plans to close a 270KT PP plant in Europe, due to sluggish demand and margin pressures
- The construction and real-estate markets in the Asian region, particularly in mainland China, remained notably weak, exerting further downward pressure on resin pricing. Additionally, a significant 18 percent dip in crude oil prices throughout the year compared to 2022 had an adverse impact on resin pricing
- As a result of seasonal destocking in the last quarter and persistently weak downstream demand, the global resins market is anticipated to maintain a subdued outlook throughout 2023

BEROE RESINS COMPOSITE PRICE INDEX



Base Year: 2019

PRICE OUTLOOK

Solvents	2023 (Est. Avg.) \$/MT	2024 (F. Avg.) \$/MT
Polypropylene	898	1,009
Polyethylene	933	975
PET	940	967

PRODUCTION OUTLOOK FAVORABLE UNFAVORABLE STABLE

Global Resins Outlook (2/2)

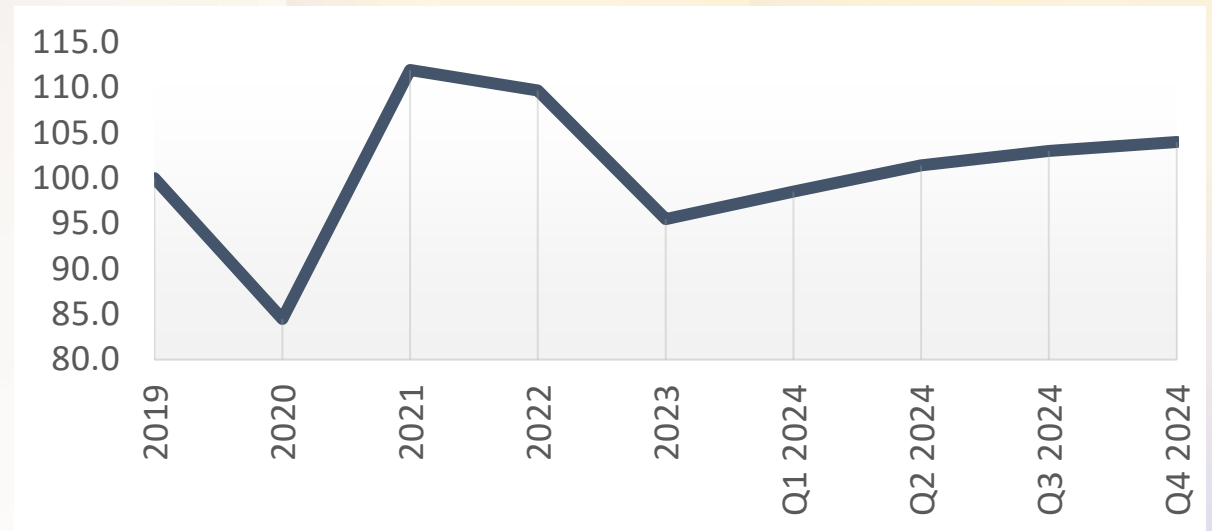
SUPPLY PROJECTIONS

PET POLYPROPYLENE POLYETHYLENE

Market Overview 2024

- Global resin pricing is expected to witness a steady to marginal increase in 2024. No major price hikes are expected, as the macroeconomic pressures from interest and inflation rates are expected to persist at least until Q2 2024
- Internal crude oil forecasts suggest a very stable trend in 2024 without any major price increases. Consequently, global resin prices are also expected to remain stable during the period
- In late H2 2024, the US presidential elections are expected to trigger a positive movement in the western economy through reduction of federal interest rates. This is expected to reflect positively on global resin prices
- From the demand perspective, the global construction and automobile industries are expected to remain significantly weak in 2024, with a notable recovery expected only in 2025. Hence, weighing negatively on the global resin pricing
- The resins market, especially for PP and PE, is oversupplied with pipeline/planned capacities 20–25 percent more-than-expected demand in 2024. Hence, supply risk is minimal; however, capacity rationalizations are expected, especially in Europe and Asia

BEROE RESINS COMPOSITE PRICE INDEX



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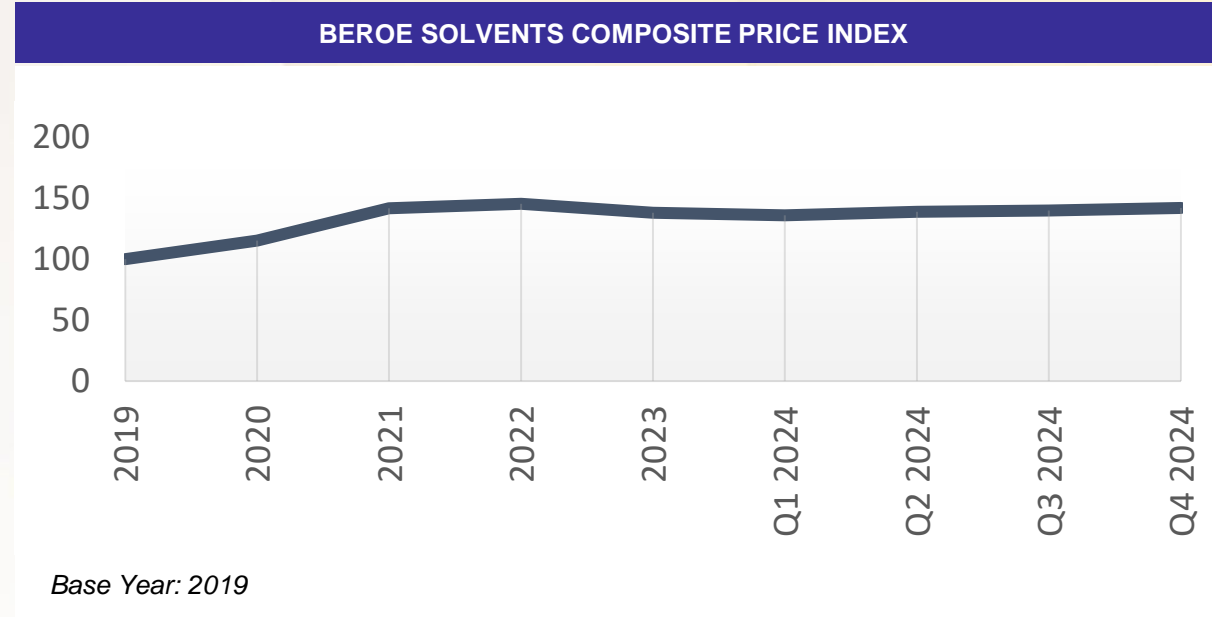
PRODUCTION OUTLOOK FAVORABLE UNFAVORABLE STABLE

Global Solvents Outlook (1/2)

SUPPLY PROJECTIONS ACETONE ↓ ISOPROPANOL ↑ METHANOL ↓ ETHYL ACETATE ↔

Market Overview 2023

- Demand for solvents remained weak in 2023 as compared to 2022 levels, owing to macro-economic challenges. Facing sluggish demand and excess inventory, many regional suppliers adopted a cautious strategy, delaying further purchases amid market volatility
- Solvent production generally kept pace with demand during 2023, although some regions faced temporary shortages, due to logistical disruptions or raw material price fluctuations
- The Chinese Yuan's depreciation against the US Dollar and other ongoing concerns about the strength of other Asian currencies made imports unprofitable by limiting demand. Furthermore, geopolitical issues and rising energy costs, among other additional factors, impacted the supply chain, leading to price fluctuations for certain solvents
- Market analysis suggests a possible decrease in consumption in December. This could be attributed to typical year-end activities, like inventory reduction (destocking) and a reduced number of working days, owing to the holiday season



PRICE OUTLOOK

Solvents	2023 (Est. Avg.) \$/MT	2024 (F. Avg.) \$/MT
Acetone	1,022	1,070
Isopropanol	883	899
Methanol	285	287
Ethyl Acetate	946	911

PRODUCTION OUTLOOK FAVORABLE ↑ UNFAVORABLE ↓ STABLE ↔

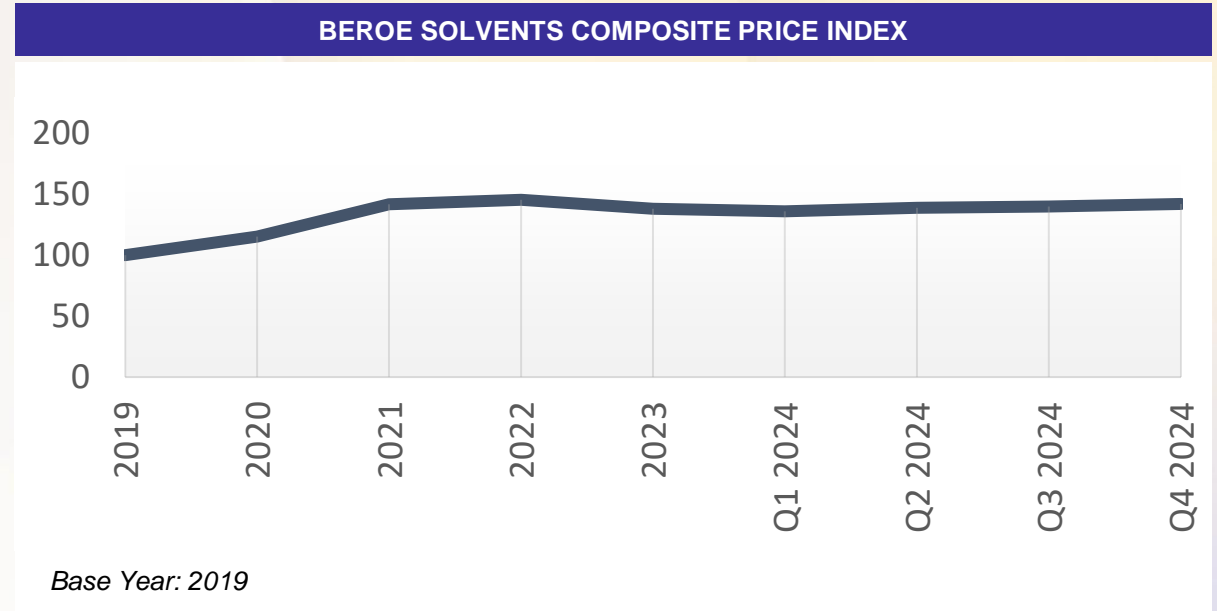


Global Solvents Outlook (2/2)

SUPPLY PROJECTIONS ACETONE ↓ ISOPROPANOL ↑ METHANOL ↓ ETHYL ACETATE ↔

Market Overview 2024

- Prices of solvents are expected to rise in Q1 2024, owing to restocking activities and improved demand sentiments from the automotive and construction sectors
- The US economy is expected to witness economic injections in H1 2024, as the country is expected to face presidential elections in H2 2024. This is expected to boost sectors, such as the construction and automobile, which is likely to eventually boost the demand for solvents
- Supply conditions are likely to be mixed, with some solvents facing tighter supply and others experiencing stability or even growth
- The solvent market is expected to have a moderate growth in 2024, due to increased industrial activity, particularly in construction, coatings, and pharmaceuticals, which is expected to fuel the demand for solvents. Additionally, growing awareness of environmental regulations might lead to a shift towards less harmful solvent alternatives, creating new market segments

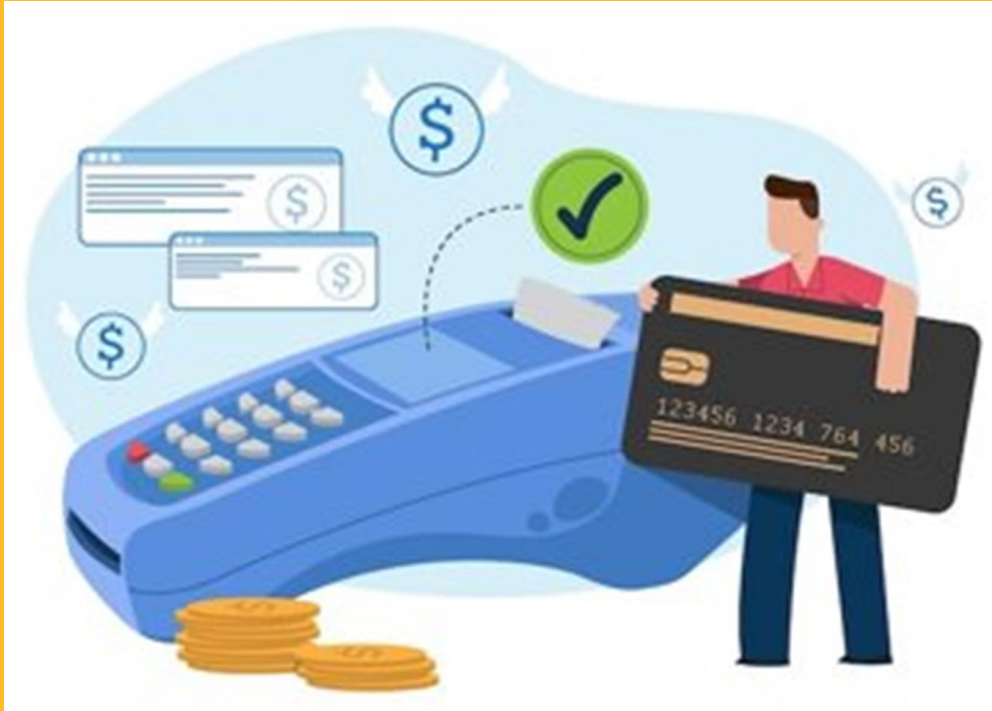


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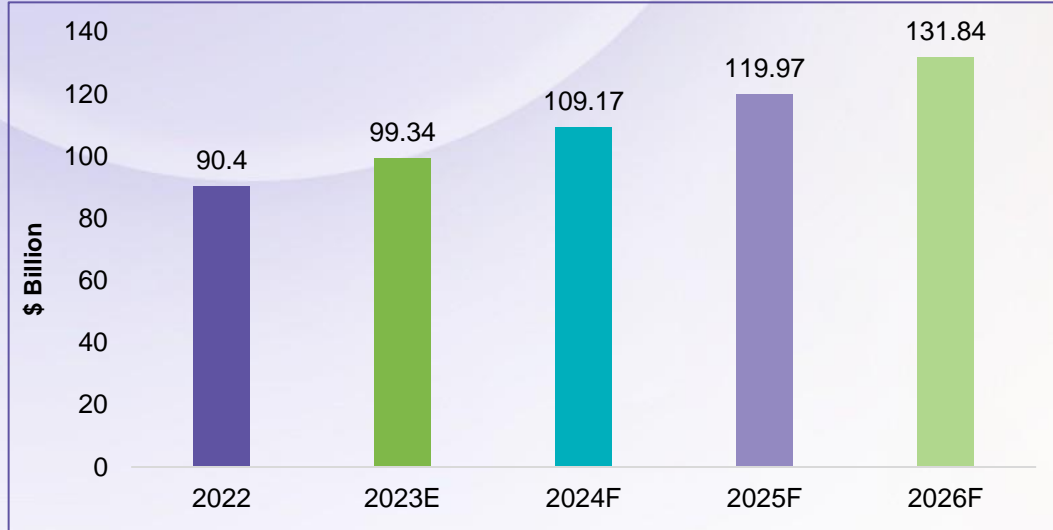




PAYMENT PROCESSING

Payment Processing Services

Payment Processing Services Market Value



- The payment processing market is projected to grow to \$132 billion by 2026, at a CAGR of 15.6 percent
- The US is the largest and most mature market globally, while the Asia-Pacific region has seen a higher growth rate, due to increased adoption of digital and mobile payments. An increase in the use of the Internet and related services has also led to market growth in the industry
- The potential for further technological innovation and advancements, coupled with ongoing analysis of consumer behavior and market dynamics, presents significant opportunities for optimizing product performance and expanding its reach into downstream applications within the payment processing market

Key Technology Trends

Artificial Intelligence (AI)/Generative AI

- AI from its emergence has been a business driver used to address several business opportunities from sales, payments, and customer service to fraud mitigation
- For SMBs, enterprises, and multinationals, generative AI is a force multiplier that amplifies productivity, efficiency, and customer engagement
 - **Enhancing the potential for clients:** Generative AI is revolutionizing software development, automating tedious API integrations for tools, like shopping carts, CRMs, and email marketing. This will make it easier and faster for businesses to connect these tools and unlock their full potential
 - **Boosting customer support:** The capabilities of generative AI-powered chatbots are set to evolve considerably, enabling them to more effectively address and anticipate customer needs

Embedded Payments

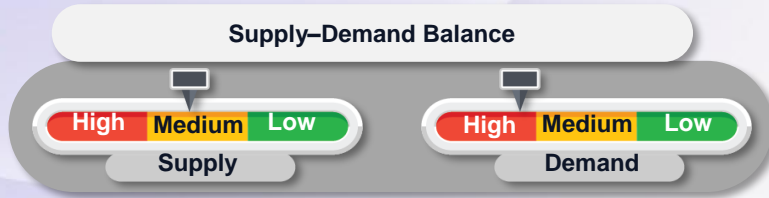
- Driven by the recognition of its multifaceted advantages, embedded payments are set to experience sustained growth beyond 2024, empowering businesses with improved repeat sales, optimized cash flow, seamless reconciliation, and minimized payment errors
- Minimizing friction and embedding payments seamlessly into the customer experience, businesses can leverage embedded payments to cultivate stronger brand loyalty and forge deeper connections with their clientele
- Embedded payments offer businesses a rich stream of automatically collected data and analytics. This enables them to optimize customer experiences by boosting convenience and fostering loyalty, ultimately leading to repeat purchases



Insurance Services

Insurance Services – Global Market Overview 2024

Health Insurance – Market Outlook

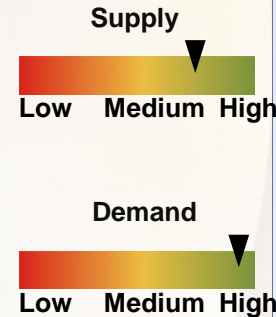


Health Insurance– Industry Trends

Industry Trend	Impact on Buyer
Cost increases exceeding 10 percent are expected in over half of markets.	
Skill gaps disrupt health systems.	
Insurers are offering cost-containment options to employers, but many have not adjusted key measures, like deductibles, necessitating active negotiation from employers and advisors.	
Employers can boost employee well-being by offering inclusive benefits, like mental health, socialization, and learning coverage for families, as more than half of insurers lack such offerings.	

Bad trend Good trend

General/Non-Life Insurance: Supply–Demand Outlook



- Property insurance premium volumes are estimated to grow by 4.2 percent in real terms in 2023 and by **2.6 percent in 2024**, driven by increased natural catastrophes and rising property costs
- Motor insurance premium volumes are projected to increase by **2.2 percent in 2024**, owing to rising repair costs
- Demand for corporate and cyber insurance has increased drastically, and corporates are reviewing their existing insurance coverage for optimum coverage on these policies
- Despite the Inflation, global conflicts, and other factors slowing the growth rate of non-life insurance, the demand and supply are expected to increase in 2024

General/Non-Life Insurance: Price Outlook

- In Q3 2023, global property insurance witnessed a notable **increase of 7 percent**, while casualty insurance maintained a steady **rise of 3 percent**
- Overall insurance pricing in the US experienced an average increase of 4 percent. Regionally, Latin America and the Caribbean saw a substantial surge of 10 percent, Europe observed a 4 percent uptick, the Pacific region recorded a 1 percent rise, and India, the Middle East, and Africa collectively encountered a 3 percent increase on an average
- Rising inflation and increasing natural calamities are the primary drivers of premium increase in 2023, and the trend is expected to continue in 2024 and beyond

Increase Favorable

Increase Unfavorable



Finance and Accounting Outsourcing

Finance and Accounting Outsourcing

Global Finance and Accounting Outsourcing Market Value



- The FAO market is expected to record a growth of 9.1 percent until 2030 to reach \$113 billion
- The US market will continue to be the highest-growing market, due to the growing adoption of cloud services and growing digital-enabled services
- The IT and telecom sectors are expected to record the highest growth, owing to their growing capital expenditure. The offerings are expected to help them manage their assets, gain and maintain their customer base

Key Market Trends

Major Challenges

High turnover rates, growing inflationary conditions, talent shortage, and increasing labor costs are the major challenges in the market currently. Major suppliers in the market have reported an increase in subcontracting costs in the latest financial year.

Increase in the Use of Automation

Advanced technologies, such as AI and machine learning, will further automate processes, urging businesses to invest in cutting-edge software to ensure a successful digital transformation.

Blockchain

Blockchain is being used to revolutionize finance with its transparency and security. Financial institutions are adopting blockchain for regulatory compliance.



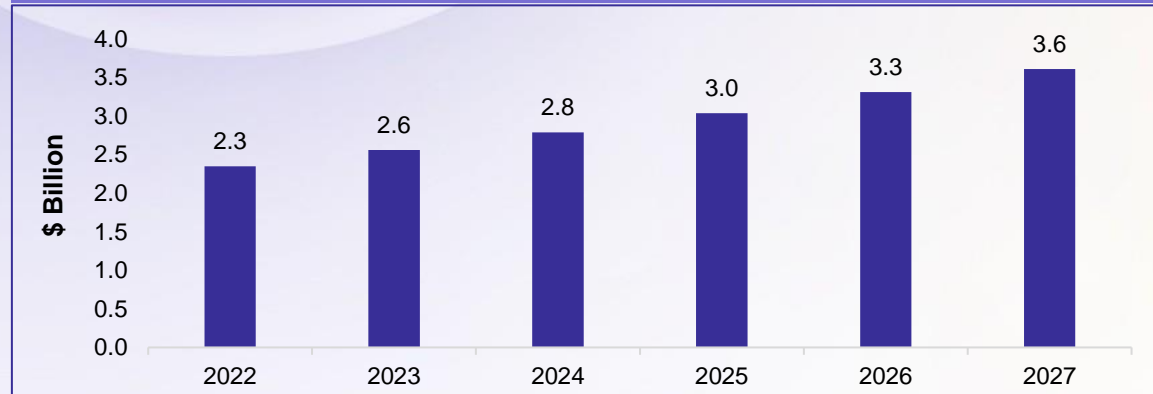
Pharma Directs – API and Biologics

Cell Culture Media – Global Market

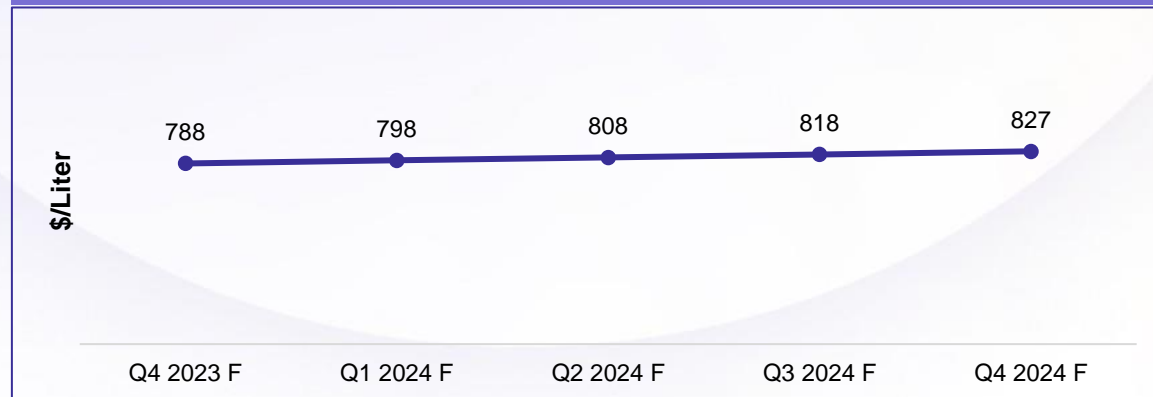
Overview

The cell culture media market is expected to grow at a faster pace, as long as there is growth in the biopharma manufacturing and contract manufacturing segment. Evaluating the supply chain of suppliers is essential to ensure how they manage the hundreds of components that are used in various cell culture media formulations. Working with experienced cell culture media or complex biology manufacturers, who have several years of experience, will limit exposure to risk and ensure consistency in supply.

Global Cell Culture Media Market



Feedstock Price Trend: Fetal Bovine Serum Forecast (Australia)



KEY INSIGHTS

SUPPLY MARKET DYNAMICS

- Major manufacturers, like Cytiva, Thermo Fisher, and MilliporeSigma, have invested in the expansion of manufacturing facilities to meet the current demand and future demand. The market is highly consolidated, with Thermo Fisher holding nearly 30–40 percent of the market share

MARKET OUTLOOK

- The cell culture media market is expected to reach a value of \$3.6 billion by 2027, with a CAGR between 8 percent and 9 percent from 2023 to 2027
- Media is one of the rapidly growing segments in the overall cell culture market. The increasing use of cell cultures in upstream bioprocessing has driven the demand for better-defined media
- The market is highly consolidated with Thermo Fisher holding nearly 30–40 percent of the market share and is even more competitive after the acquisition of Sigma by Merck
- The FBS price witnessed a decreasing trend in Q3 2023 compared to Q2 2023, based on historical data and forecast the price is expected to increase. The price is expected to reach \$827/liter by Q4 2024

Cell Culture Media Market Trends 2024 Forecast

Serum-free and Chemically Defined Media

- The serum-free or animal-origin free component-based product innovations are growing in the market
- In 2024, it is expected to grow further

Application of AI

- The application of AI and MI is increasing in cell culture manufacturing operations and analysis
- This implementation is expected to increase further in 2024

Cell Therapy Demand

- The demand for media from the cell therapy market is increasing, and in 2024, it is expected to further increase. The demand for 3D cell culture media is increasing

Technology and Innovation Trends

- Cell culture media for cell and gene therapy applications, novel supplementary components launching and the use of advanced software & and tools to improve the efficiency and pace are the major trends currently prevalent in the market

Capacity Addition and Expansion

- Many top players and major players are expanding their capacity to meet the global demand
- Cytiva, Merck, Thermo Fisher, Sartorius, and Fujifilm are expanding their manufacturing capacity

Acquisitions

- Companies, like FUJIFILM, Thermo Fisher, Cytiva, and Sartorius, have been actively involved in the cell culture media market through acquisition or capacity addition
- The acquisitions are primarily focused on portfolio establishment

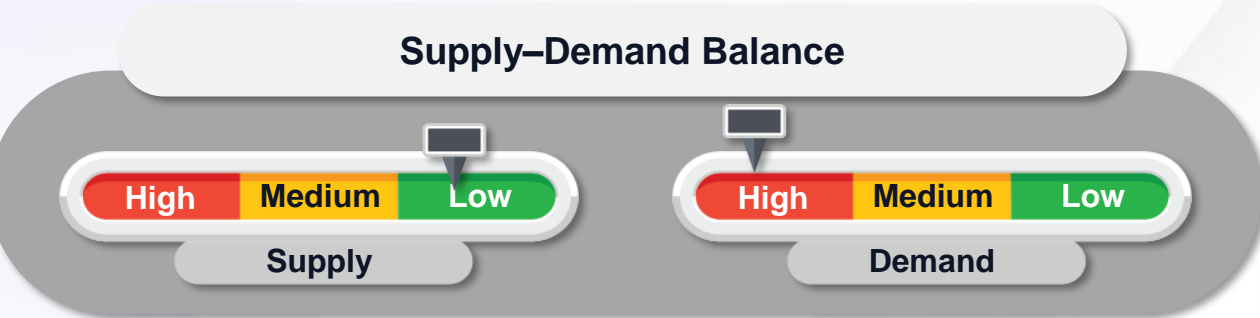
Price Increase

- The price is expected to increase in 2024, due to the impact of geopolitical conditions

Penicillin – Global Market Overview

- Penicillin is a medication used to manage and treat a wide range of infections. It is in the beta-lactam antibiotic class of drugs. Penicillin V is one type of penicillin antibiotic and is used to treat a wide range of bacterial infections, such as ear infections, throat infections, and skin infections, and prevent rheumatic fever
- Currently, the demand for Penicillin is high, and the supply is low in the market and the category risk is also high
- The European-regulated suppliers cater to global big pharma companies and Chinese non-regulated players cater to non-regulated markets

Market Supply and Demand Trends



KEY INSIGHTS

SUPPLY MARKET DYNAMICS

- Penicillin API has always experienced a supply shortage, due to less availability of raw materials
- The supply is expected to increase, as suppliers, such as Aurobindo and Sandoz, are expanding their manufacturing capacity. There is currently serious supply shortage in the US, Australia, and other European nations

MARKET OUTLOOK

- Demand for penicillin products is constantly on the rise, considering the diagnosis of various diseases, such as syphilis
- Increased demand for penicillin has led to supplier shortages across the globe
- Average prices of Penicillin G Potassium sourced from China decreased by 1–2 percent in November 2023; supply is expected to normalize in H1 2024
- The raw material cost is also increasing, especially sourced from European countries, like Austria and Spain
- Penicillin shortages are reported in the US, Europe, and Australia as well
- The global penicillin market is around 50,000–60,000 MT in 2022 and is almost stable in the past few years. China is the major region of supply with an installed capacity of 100,000 MT; however, the utilization rate is 30–40 percent. 90 percent of the Chinese production is exported

Penicillin Market Trends 2024 Forecast

Supply Trends

- The experts and analysts forecast that penicillin with lower strength will be in shortage until November 2024 and penicillin with higher strength will be in shortage until February 2024 in Australia
- Australia TGA has approved an alternative brand called, Brancaster Pharma, UK, temporarily until March 2024
- Teva estimates the resupply dates of penicillin around mid-January 2024
- The overall global market is expected to normalize the supply of penicillin by H1 2024
- Pfizer's combination dosages supply is expected to be restored by Q3 2023 and their long-acting forms supply are expected to be restored by Q2 2024
- The expansion of manufacturing plants will also help in increasing the supply of Penicillin

Opportunities due to China - Offshoring

- Due to the US–China tension and the impact of the COVID-19 pandemic, many countries and companies are off-shoring from Chinese suppliers. The complete off-shoring will take time; however, the steps and initiation are taken off-shore. Due to this situation, other countries like India will have opportunities to get selected as alternate regions. India is also taking measures to reduce reliance on China actively
- Other developed regions are also taking measures to attain self-sufficiency
- Suppliers, such as Aurobindo and Sandoz, are expanding their manufacturing capacity in India and Europe, respectively
- Countries, like India, Japan, Korea, Europe, and the US, are taking measures to achieve self-sufficiency in the API industry; and in 2024, this trend is expected to continue

Price Trend

- The price of penicillin is dependent on the availability of API and raw materials. Penicillium chrysogenum accounts for 50–60 percent of the total cost of penicillin
- The prices of penicillin in Europe are expected to increase up to 5 percent by the end of 2024, and in China, the prices are expected to increase by 5–10 percent by the end of the year 2024. Europe-sourced Penicillin V Potassium has increased in 2023, based on demand, the price is expected to increase
- The geopolitical conditions also may contribute to the increase in the price of API and other raw materials
- The volume-based purchase, multi-sourcing, regional sourcing, and long-term contracts can help in saving costs to some extent

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