Lead Market Outlook 2023:

The End of the Beginning, Not the Beginning of the End

The International Lead Conference 2023

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Agenda

- **Lead's Price Performance & Macro Background**
  Looking back, to look forward

- **What Are the Fundamentals Telling Us?**
  Micro fundamentals to separate out price performance

- **What Impact is Decarbonisation Having on Lead in Reality?**

- **Conclusions and 2023 Price Outlook**

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# Lead's Price Performance & Macro Background

Lead a Base Metal – In Theory

Base Metal LME Index Versus LME 3M Lead

Lead is highly correlated to the base metal index; therefore, it is important to have a view on key driving forces that impact the suite

Looking Back - Industrial Metals the Worst Performing Commodity Sector in 2022

Commodity By Sector Price Performance 2022 Versus 2021
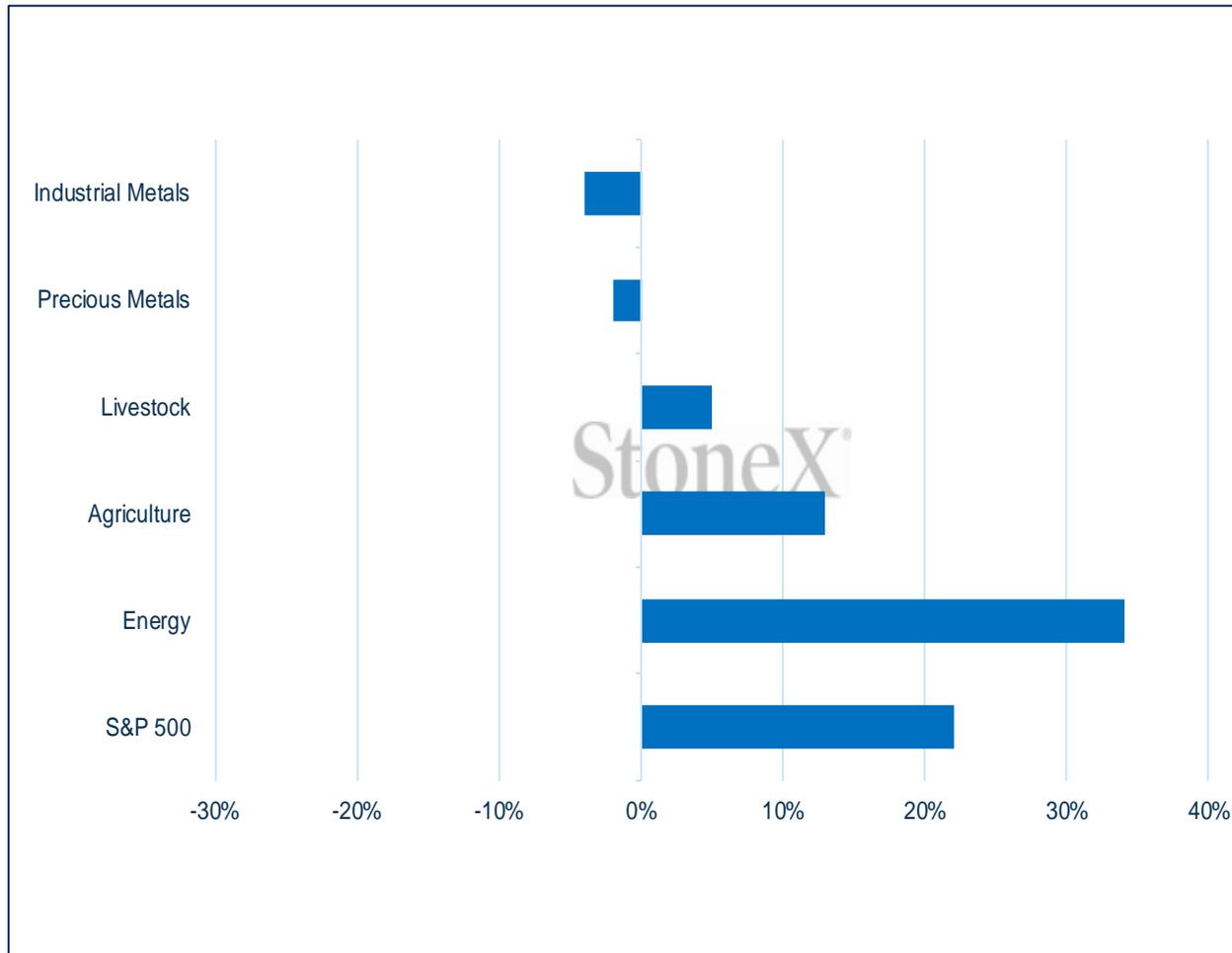
Source: Bloomberg, StoneX

Why Was This?

A 'perfect storm' of macro headwinds:

- Major central banks moved to tighten monetary policy on rising inflation, while economic growth became a concern.

- The U.S. dollar outperformed other global currencies, hitting a 20-year high.

- Russia's invasion of Ukraine (and consequent implementation of global sanctions) placed European energy security at risk.

- China's economic growth (GDP) fell well below the 2022 set target of 5.5% due to the country's commitment to a zero-tolerance approach to COVID-19.

- Global manufacturing (as a result of the above) was unable to return to levels posted in 2021.

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Looking Back - Base Metal Prices Encountered Significant Volatility in 2022

KEY

■ Price Headwind

■ Price Tailwind

European coal, natural gas & Brent crude oil, copper, aluminium, tin, nickel hit record highs by early March

U.S. lifts interest rates for the first time since December 2018
March (0.25%), May (0.50%), June (0.75%), July (0.75%), Sep (0.75%), Nov (0.75%), Dec (0.50%)

Russia invades Ukraine 24th Feb

China faces largest COVID-19 lockdown since 2020

China power crunch

China resumes international travel

Supply concerns arise in China & Europe

Omicron variant named 26th Nov

Sanctions implemented on Russia

Global freight rates remain elevated

Index

5400
5000
4600
4200
3800
3400

Sep-21   Dec-21   Mar-22   Jun-22   Sep-22   Dec-22

Source: Bloomberg, StoneX

Looking Forward – Price Action Continues to Be Dominated By Macro Forces

Base Metal LME Index

KEY

■ Price Headwind

■ Price Tailwind

China resumes international travel

BCOM Index re-weighting to include lead

Federal Reserve lifts rates by 25 bp

Start of China's Two Sessions

SVB Receivership

U.S. ban imports of Russian steel and aluminium

Federal Reserve lifts rates by 25 bp

ECB & Federal Reserve Lift Rates by 25 bp

State of Emergency announced in various Peruvian cities

ECB lifts interest rate by 50 basis points

UBS agrees to buy Credit Suisse

Chinese economic data keeps market expectations for demand recovery luck warm

Source: Bloomberg, StoneX

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Looking Forward: Understanding Global Macro Drivers Will Be Central in Forecasting Future Price Performance

Impact of key western interest rates to dent demand

Key Western Interest Rates
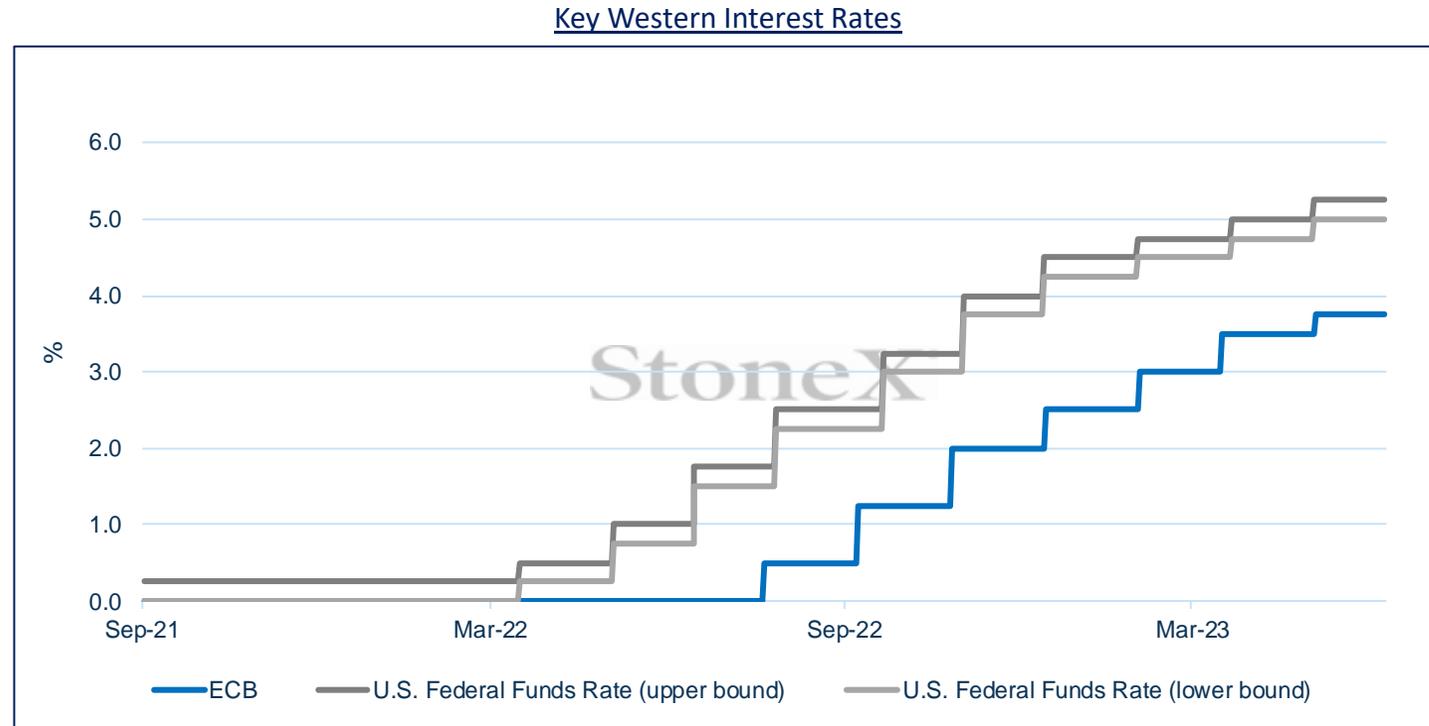
Full impact on demand to be felt in H2 2023

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Source: Bloomberg, StoneX

Looking Forward: Understanding Global Macro Drivers Will Be Central in Forecasting Future Price Performance

Global manufacturing set to remain below 2021 levels

Global Manufacturing PMI Readings

	United States	Eurozone	China	Global	Japan
31/03/2022	58.8	56.5	49.5	53.0	54.1
30/04/2022	59.2	55.5	47.4	52.3	53.5
31/05/2022	57.0	54.6	49.6	52.3	53.3
30/06/2022	52.7	52.1	50.2	52.2	52.7
31/07/2022	52.2	49.8	49.0	51.1	52.1
31/08/2022	51.5	49.6	49.4	50.3	51.5
30/09/2022	52.0	48.4	50.1	49.8	50.8
31/10/2022	50.4	46.4	49.2	49.4	50.7
30/11/2022	47.7	47.1	48.0	48.8	49.0
31/12/2022	46.2	47.8	47.0	48.7	48.9
31/01/2023	46.9	48.8	50.1	49.1	48.9
28/02/2023	47.3	48.5	52.6	49.9	47.7
31/03/2023	49.2	47.3	51.9	49.6	49.2
30/04/2023	50.2	45.8	49.2	49.6	49.5
31/05/2023	48.4	44.8	48.8	49.6	50.6

Unlikely to return to peak levels in 2021

↓

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Please note: A reading <50 reflects activity is in expansionary territory. A reading >50 reflects activity is in contractionary territory.
*Source: Bloomberg, StoneX*

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Looking Forward: Understanding Global Macro Drivers Will Be Central in Forecasting Future Price Performance

Lead holds a robust negative correlation to the U.S. dollar
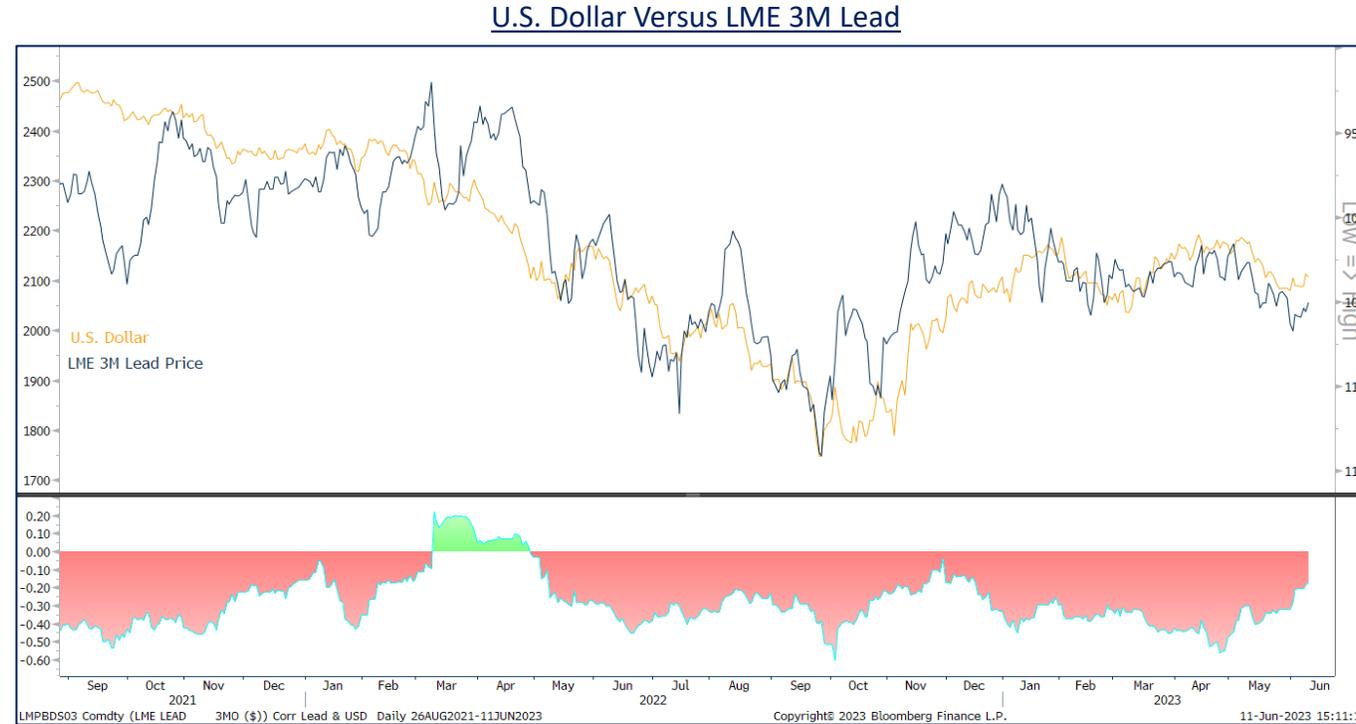
U.S. Dollar Versus LME 3M Lead

The path of U.S. Monetary policy to remain data dependent

NEUTRAL TO BULLISH

Source: Bloomberg; World Bank, StoneX

Looking Forward: Understanding Global Macro Drivers Will Be Central in Forecasting Future Price Performance

Acceleration in economic growth forecast for China in a post zero-tolerance COVID-19 environment

Chinese Forecast GDP Growth
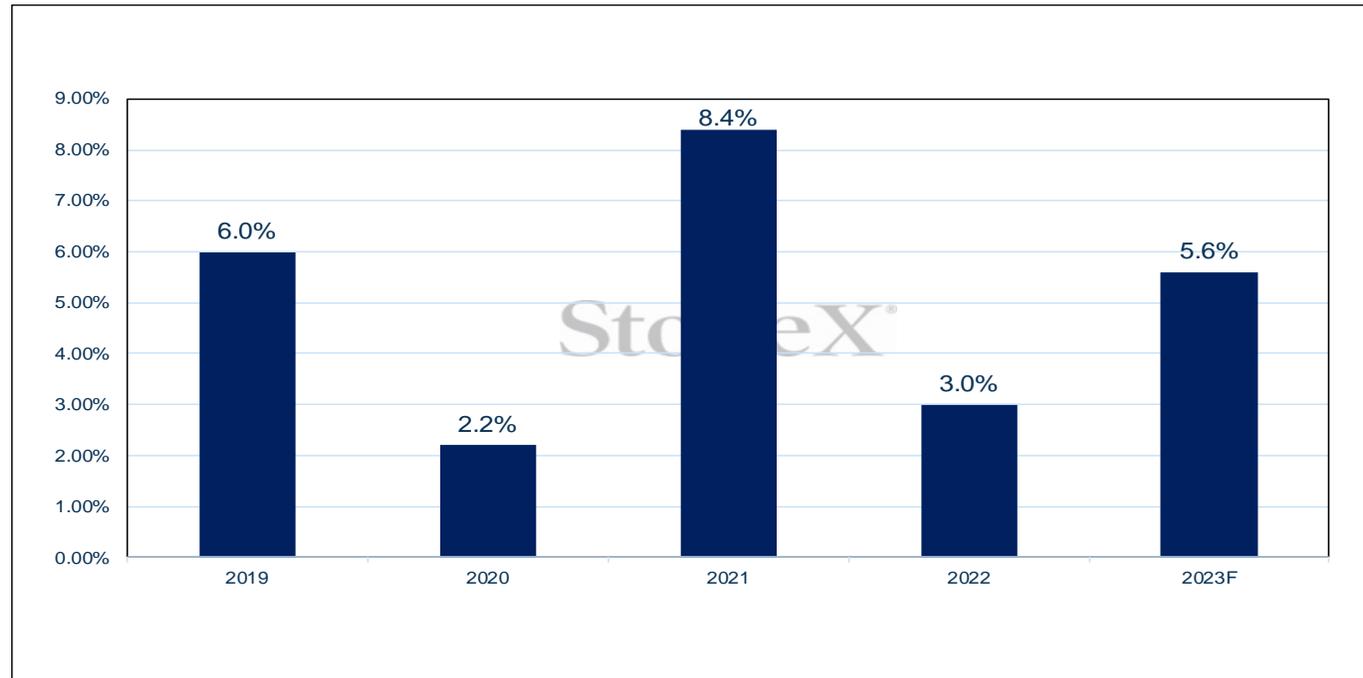
Economic growth to rebound in a post-zero tolerance world

↓

NEUTRAL TO BULLISH

This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance
Source: Bloomberg; World Bank, StoneX

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Looking Forward: Understanding Global Macro Drivers Will Be Central in Forecasting Future Price Performance

*An escalation in geopolitical tensions could de-rail our forecasts*

CBOE Volatility (VIX) Index

Commodities face downward pressure when VIX trades above 30 level
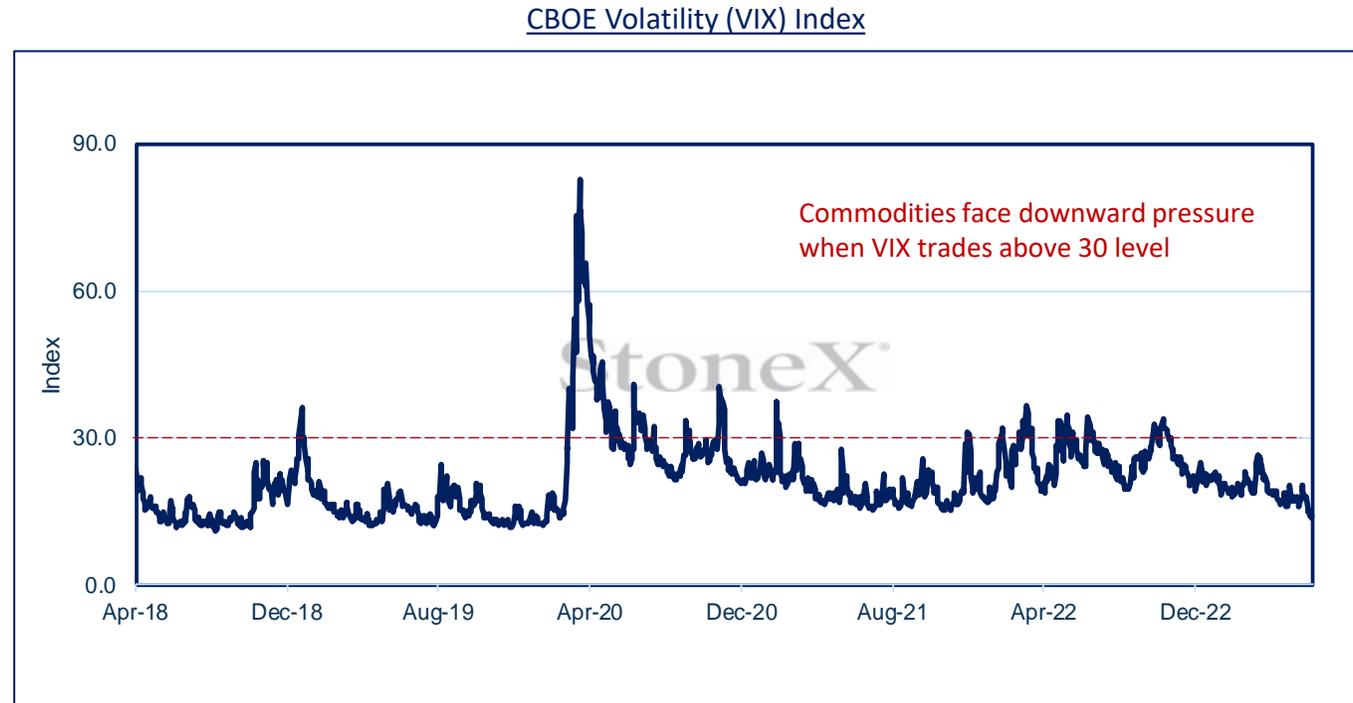
The rise of geopolitical tensions a key downward risk

NETURAL TO BEARISH

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Source: Bloomberg; World Bank, StoneX

Looking Forward – Macro Outlook Is Mixed

Understanding Global Macro Drivers Will Be Central in Forecasting Future Price Performance

Key Western Interest Rates
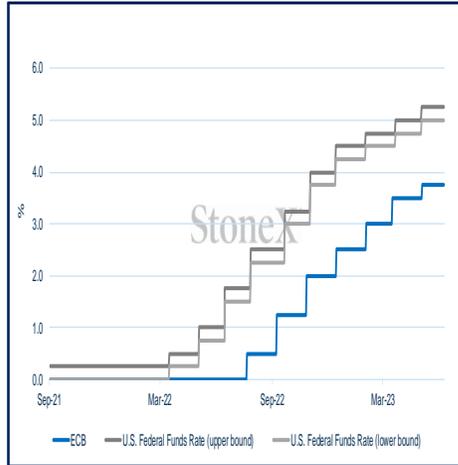
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Global Manufacturing PMI Readings

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30/06/2022	52.7	52.1	50.2	52.2	52.7
31/07/2022	52.2	49.8	49.0	51.1	52.1
31/08/2022	51.5	49.6	49.4	50.3	51.5
30/09/2022	52.0	48.4	50.1	49.8	50.8
31/10/2022	50.4	46.4	49.2	49.4	50.7
30/11/2022	47.7	47.1	48.0	48.8	49.0
31/12/2022	46.2	47.8	47.0	48.7	48.9
31/01/2023	46.9	48.8	50.1	49.1	48.9
28/02/2023	47.3	48.5	52.6	49.9	47.7
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31/05/2023	48.4	44.8	48.8	49.6	50.6

Source: Bloomberg, StoneX

U.S. Dollar

Source: Bloomberg, StoneX

Chinese Economic Growth
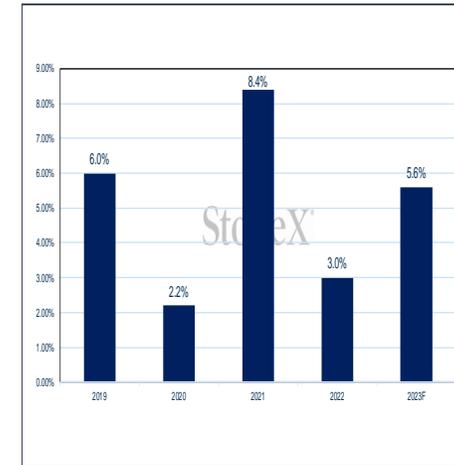
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Source: Bloomberg; World Bank, StoneX

CBOE Volatility (VIX) Index
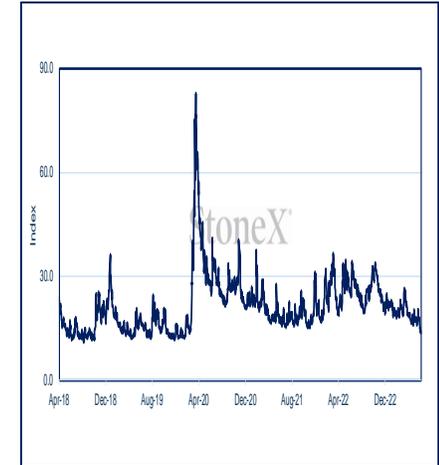
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Source: Bloomberg; World Bank, StoneX

Full impact on demand to be felt in H2 2023

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Unlikely to return to peak levels in 2021

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The path of U.S. Monetary policy to remain data dependent

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Economic growth to rebound in a post-zero tolerance world

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The rise of geopolitical tensions a key downward risk

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China a Focus Point in 2023: Timing of Recovery Key

China's Key Target Outcomes of National People's Congress (NPC) 2023

Key Targets	2023 Target	2022 Target	2022 Actual
GDP Growth	~5%	~5.5%	3.00%
Fiscal Deficit (as % of GDP)	3%	~2.8%	4.70%
Special Local Government Bond Quota (RMB)	3.85Tr	3.65Tr	4.15Tr
CPI	~3%	~3%	2%
New Urban Job Creating	~12M	<11M	12.1M
Surveyed Jobless Rate	~5.5%	>5.5%	5.50%
Energy Intensity (Decline)	~2%	No target set	n/a

Source: Bloomberg; PBoC, StoneX

Quarterly GDP Growth Forecast
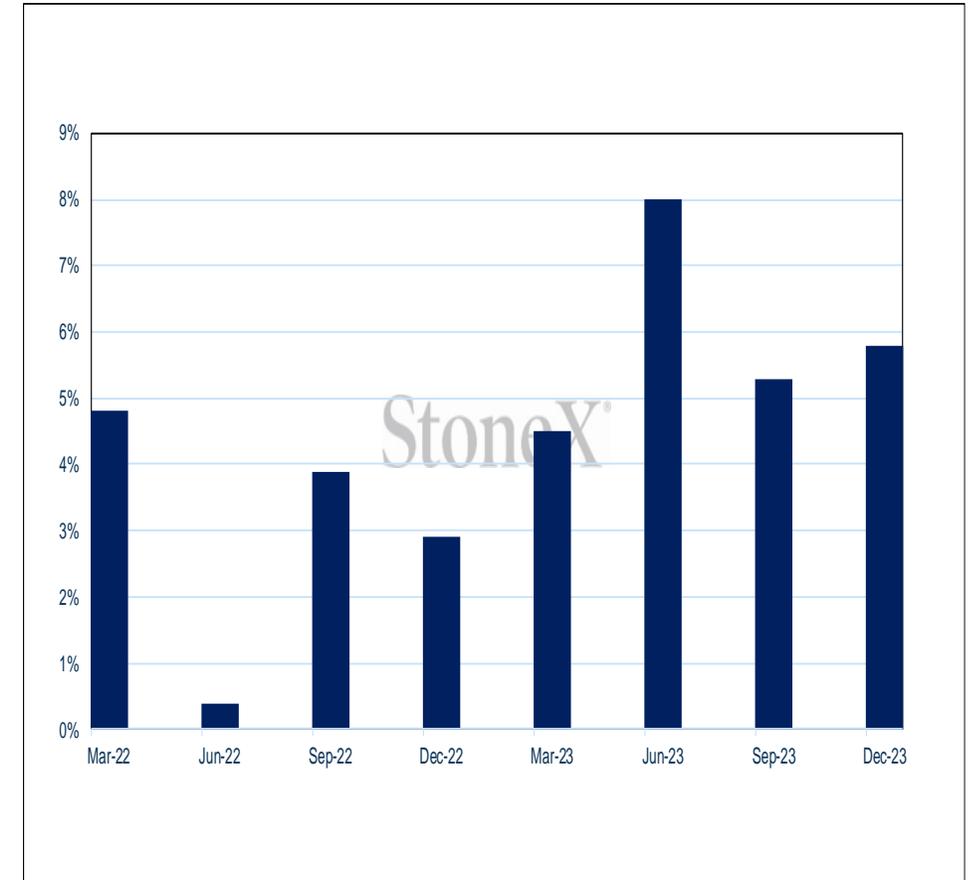
Source: Bloomberg; World Bank, StoneX

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China a Focus Point in 2023: Alteration to Trade Flows?

Chinese Imports of Russian Commodities

	Crude	LNG	Coking coal	Gold	Palladium	Aluminium	Copper	Nickel	Wheat
2023 YTD	27%	50%	92%	139%	308%	185%	-39%	-57%	247%
2022 YTD	8%	42%	96%	67%	43%	59%	-20%	-2%	-33%
2021 YTD	-5%	-10%	60%	412%	-45%	-20%	-4%	-11%	-47%

Source: Bloomberg; PBoC, StoneX

Russian President Vladimir Putin and Chinese President Xi Jinping attend a meeting at the Kremlin in Moscow, Russia, March 20, 2023.
Source: Bloomberg; Reuters, StoneX

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Lead's Unique Characteristics Shield it From Volatility

LME Base Metal 3M Price Performance 2023
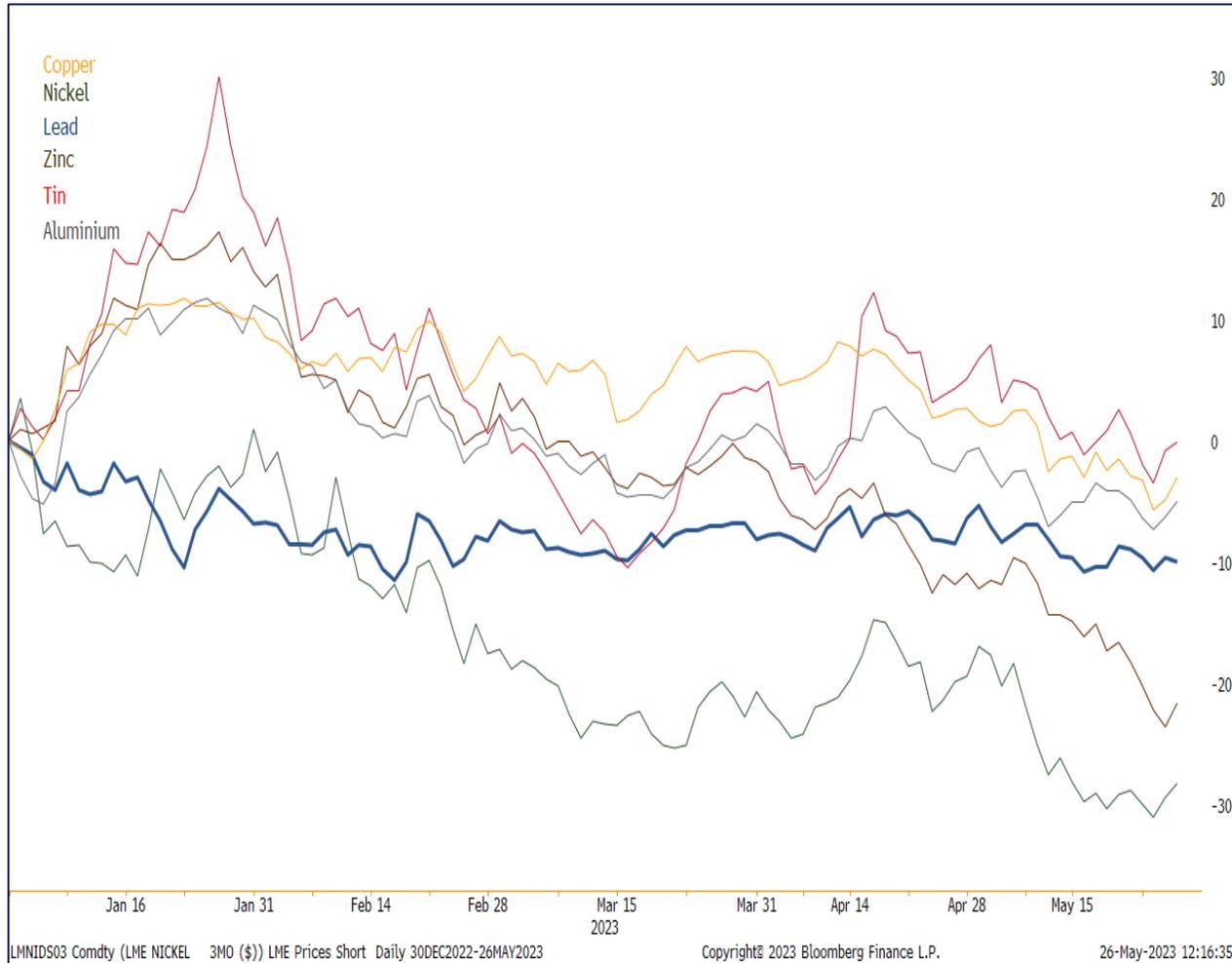
Source: Bloomberg, StoneX

Lead is likely to remain on a less volatile path than the rest of the base metal suite due to:

- Its lower exposure to primary supply risks

- Its lower exposure to primary demand risks

- Smaller market imbalances

- Relative illiquidity

- Commonly misunderstood long-term role in decarbonisation

What Are the Fundamentals Telling Us?

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Supply: Universal Rebound in Refined Production After Smelter Bottlenecks in 2022

Primary Versus Secondary Refined Supply Forecast
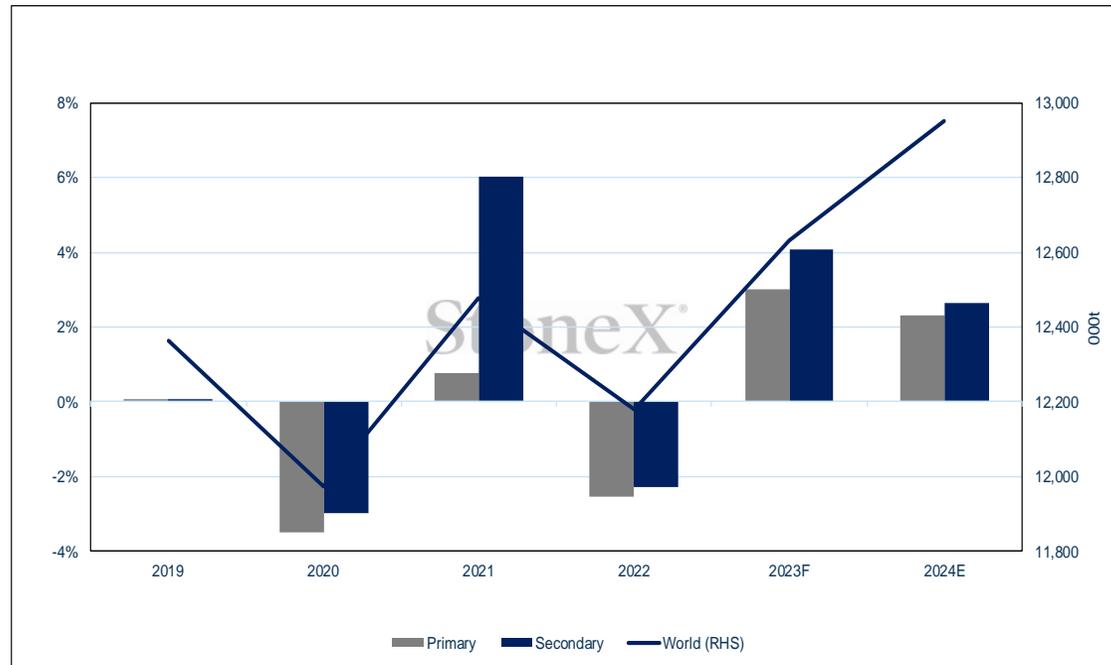
This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
*Source: Bloomberg NEF; StoneX*

Regional Refined Supply Forecast
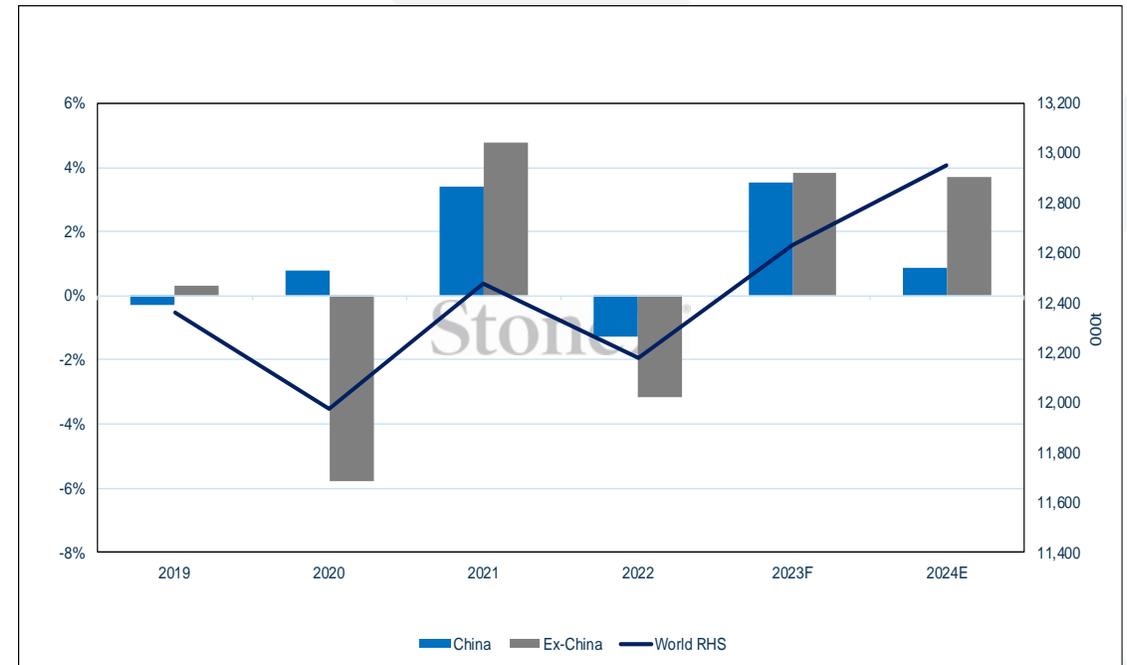
This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source: Bloomberg NEF; StoneX

Universal rebound in primary and secondary output in 2023

Universal rebound in output both within China and ex-China in 2023

Demand: Recovery in Supply Chains to Unlock Higher Demand in 2023 – Focus on China

Lead Consumption Forecast (By Region)
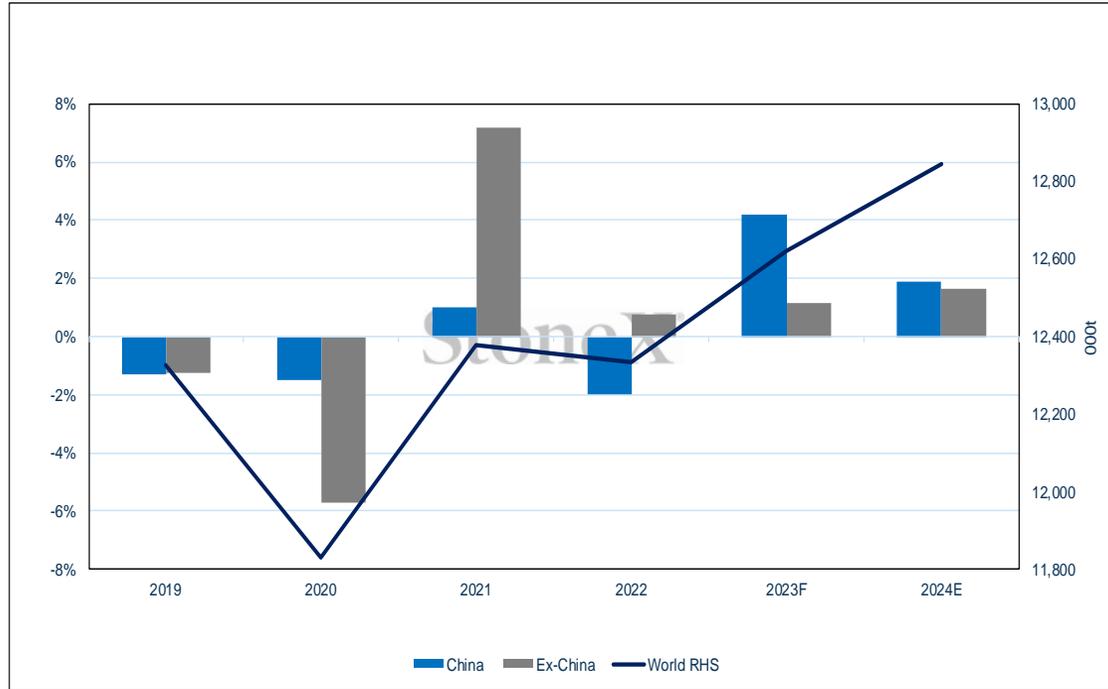
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*Source: Bloomberg NEF; StoneX*

Demand recovery dependent on China

Industrial Production Growth Separates China from Western World
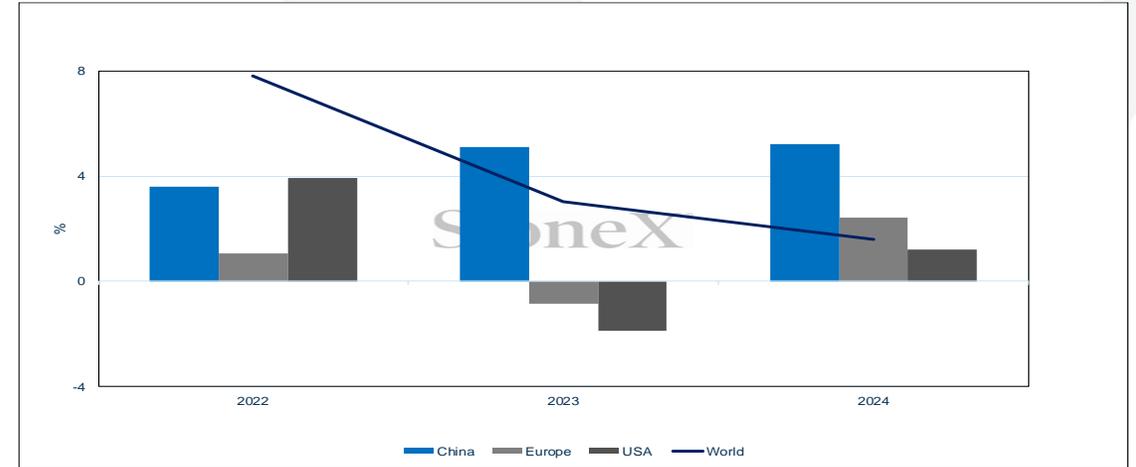
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Source: Bloomberg NEF; StoneX

ICE Vehicle Sales Versus NEV Sales
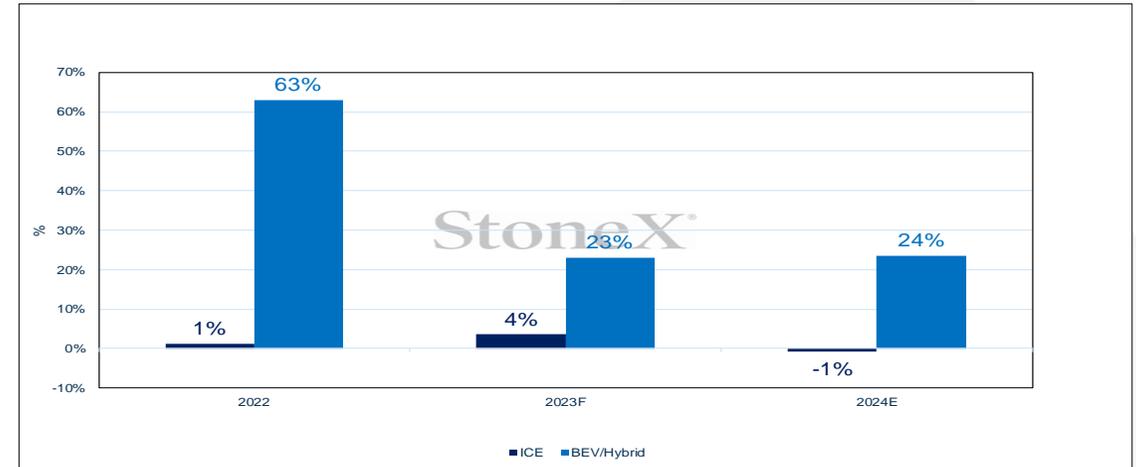
This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source: Bloomberg NEF; StoneX

Fundamental Picture to Weaken on Robust Supply & Moderate Demand

Market Balance Forecast
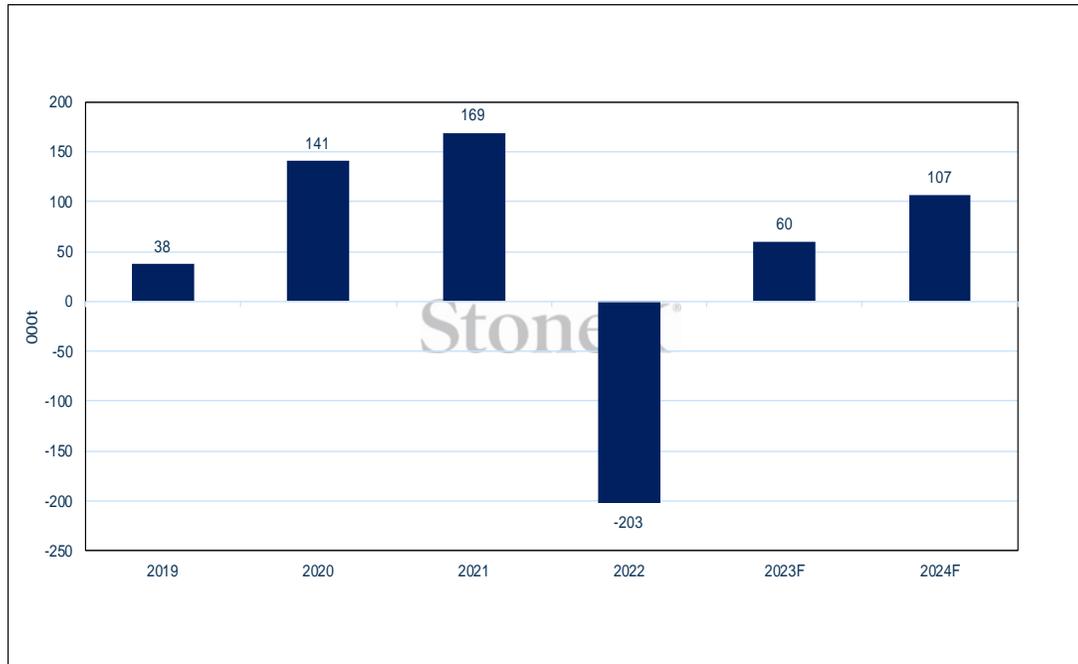
This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source: Bloomberg NEF; StoneX

Lead's market will move into a growing surplus over the 2023-2024 period

Market Balance (Split By Region)
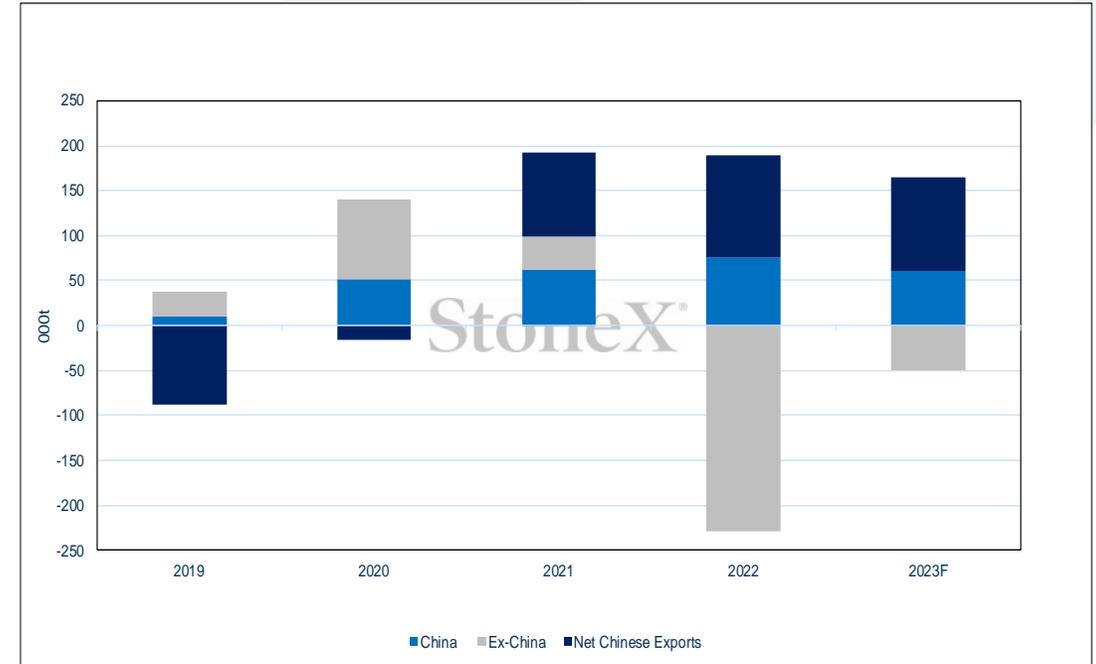
■ China   ■ Ex-China   ■ Net Chinese Exports

This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source: Bloomberg NEF; StoneX

Western market's will remain tight and depend heavily on net exports from China

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What Impact is Decarbonisation Having on Lead in Reality?

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Replacement Lead-Acid Batteries in Transport Sector to Hold Lead Demand Steady

Market Share of Vehicles By Power Train
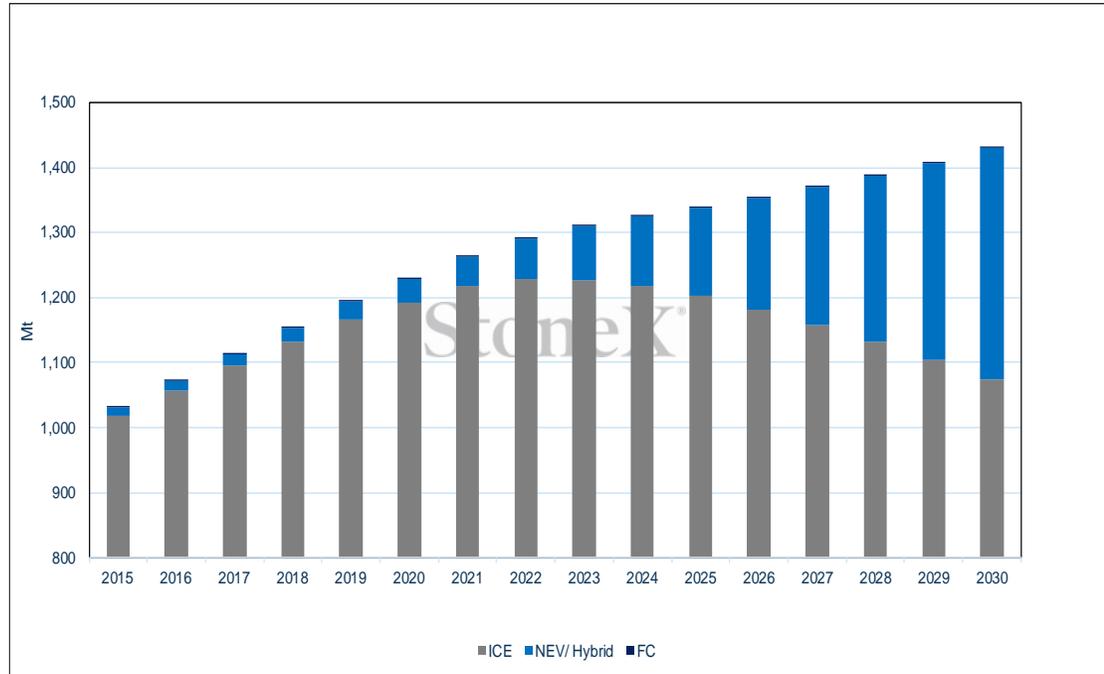
This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source: Bloomberg NEF; StoneX

NEV market share will move to 25% by 2030 from >1% in 2015

Market Share By Demand End-Use 2023
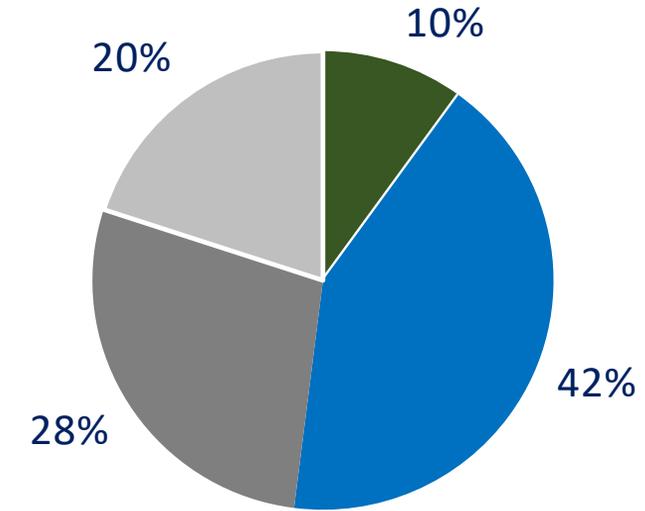
Green (ESS & NEV) ■ Transport ■ Industrial ■ Other

Source: Bloomberg NEF; StoneX

Green demand (NEV/ESS) only makes up 10% of market demand

Lead to be Part of the Decarbonisation Story

Global Rechargeable Battery Market (in MWh) by Battery Type
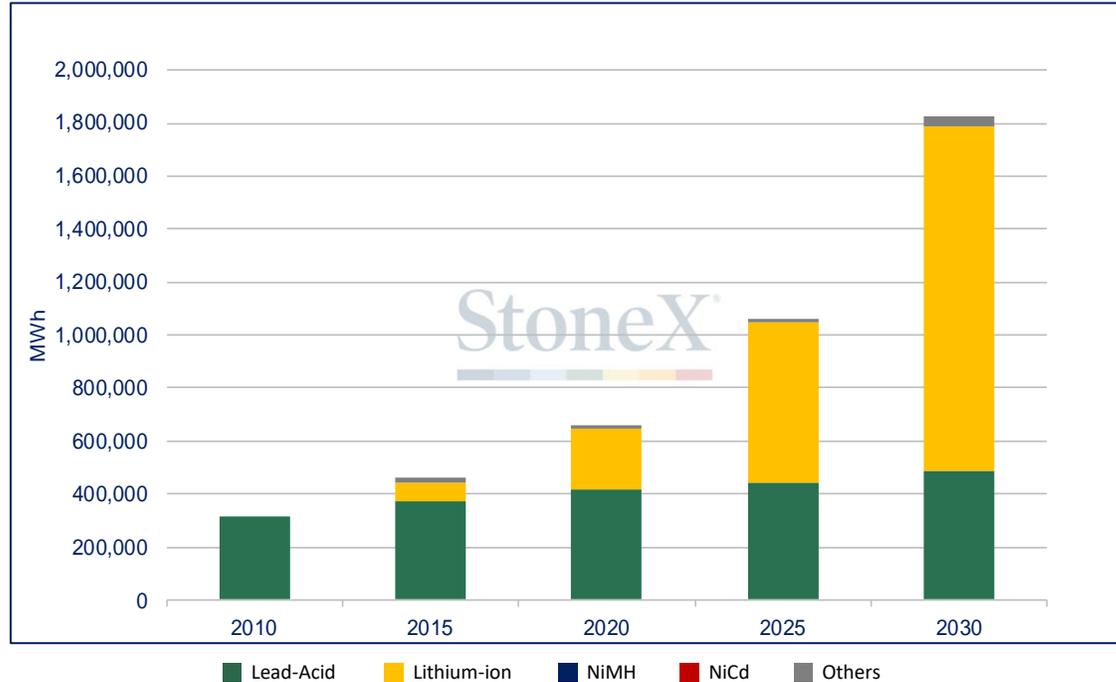
This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source for chart: Bloomberg, CRU, StoneX

Lead-acid batteries will remain a dominant battery technology over the decade, with demand set to expand

Key Drivers Behind Lead's Use in a Greener World?

- ICE vehicles to remain dominant powertrain over the decade (lead battery replacement 3x over lifetime)

- Long tail of ICE battery replacement

- Lead-Acid to remain dominant battery in industrial applications

- Use in New Electric Vehicles (as auxiliary battery)

- Increasing use in Energy Storage Systems (ESS)

- Established 'closed loop' recycling

- Lower raw material cost (compared to lithium-ion batteries)

2023 Price Outlook & Conclusions?

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Our Key Conclusions

- Macro headwinds amid modest fundamentals are set to result in lower average LME prices for lead in 2023 compared to 2022, with the market flipping into a surplus upon a universal rebound in supply.

- Regional market imbalances will remain in 2023, with China-led Asia exports key to easing tightness in the west.

- Demand recovery will continue to be aided by improving supply chains, supporting OE demand, although inflation-driven demand weakness is forecast to impede the speed of recovery over the next year, with battery replacement outstripping OE demand.

- Lead to be part of the solution towards decarbonisation goals, alongside (not against) lithium-ion batteries.

- Lead prices to remain on a less volatile path than the rest of the base metal suite due to its lower exposure to supply risks, smaller market imbalances, relative illiquidity and misunderstood long-term role in decarbonisation (weakening future investor sentiment).

Global Stock Levels

Global Visible Exchange Inventories
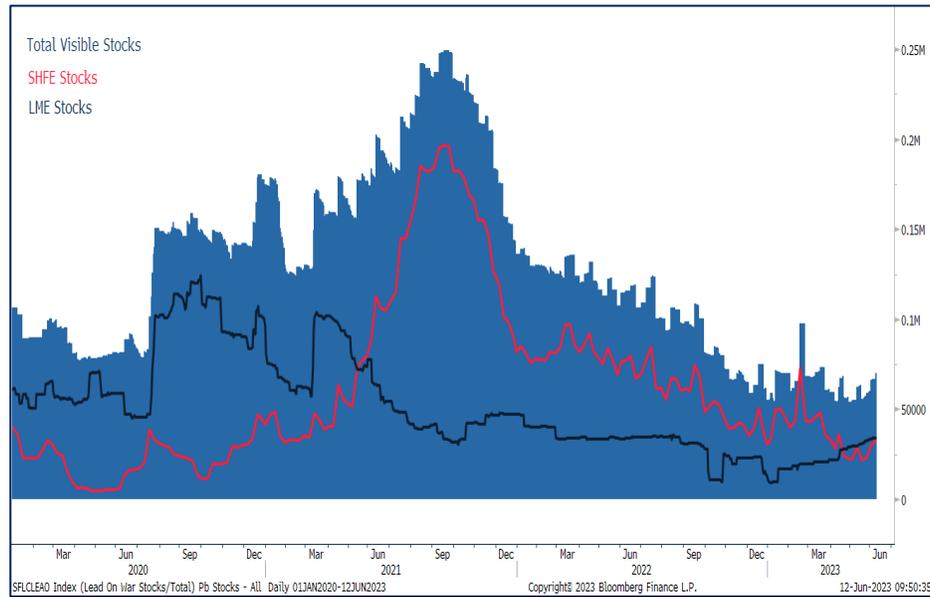
Source for chart: Bloomberg, StoneX

Stock:Demand Ratio (days)

Source for chart: Bloomberg, StoneX

We forecast a rebuild in global inventory stock over 2023, which in turn will lift the consumption ratio from record lows in 2022.

Investor 'Speculative Sentiment' Net Positions

Please note: Weekly figures taken from investment firms' net positions for LME (lots) & SHFE (lots).
Source for chart: Bloomberg, StoneX

LME Net Investor Positioning

Gross short positions move towards record levels
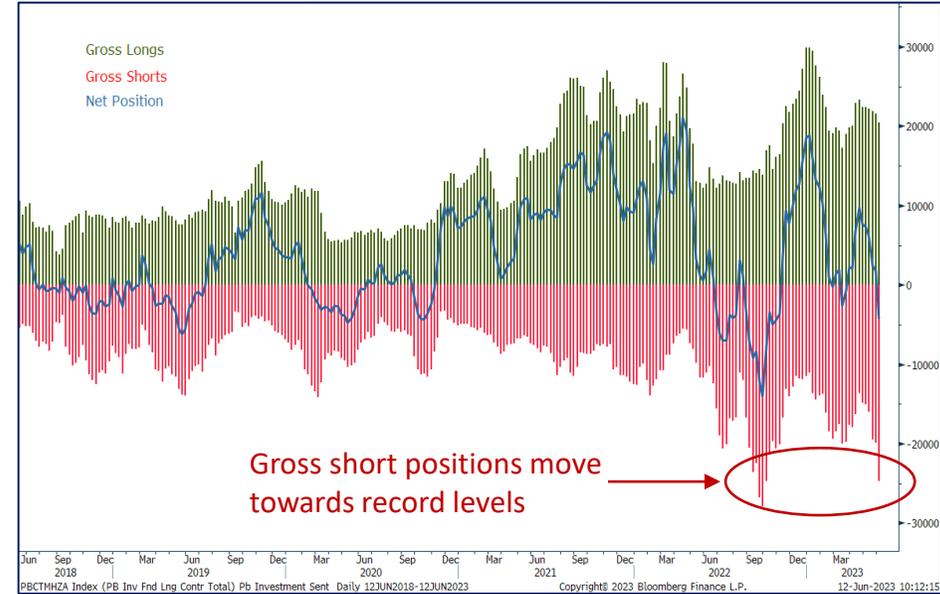
Source for chart: Bloomberg, StoneX

Divergence developing between regional net investor sentiment positioning.

Technical Picture for Lead – 200DMA to be Resistance or Support?

Technical Indicators on the LME 3M Lead Price
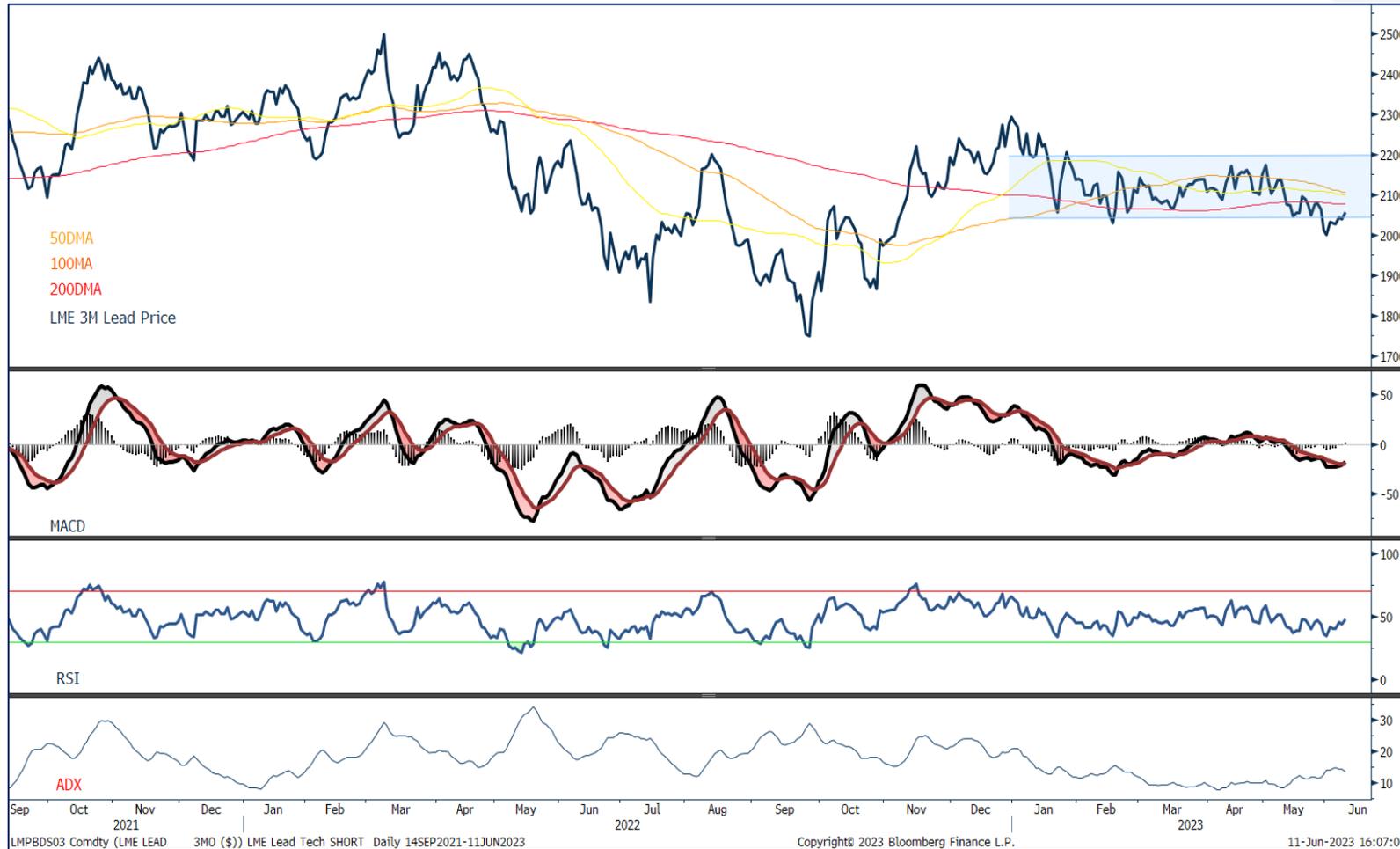
Moving Averages: Lead has broken back into its YTD sideways trending channel, with the 200-DMA set to be the next major resistance level.

RSI: Lead is currently neither oversold or overbought, therefore the price has room to move in either direction (in theory).

MACD: Momentum to the upside is starting to appear.

ADX: No significant trend.

This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Please note: DMA (Daily Moving Average), MACD (Moving Average Divergence/Convergence, RSI (Relative Strength Indicator), ADX (Average Directional Index)
Source for chart: Bloomberg, StoneX

Lead Price Forecast

Lead LME 3M Price Performance 1-Year
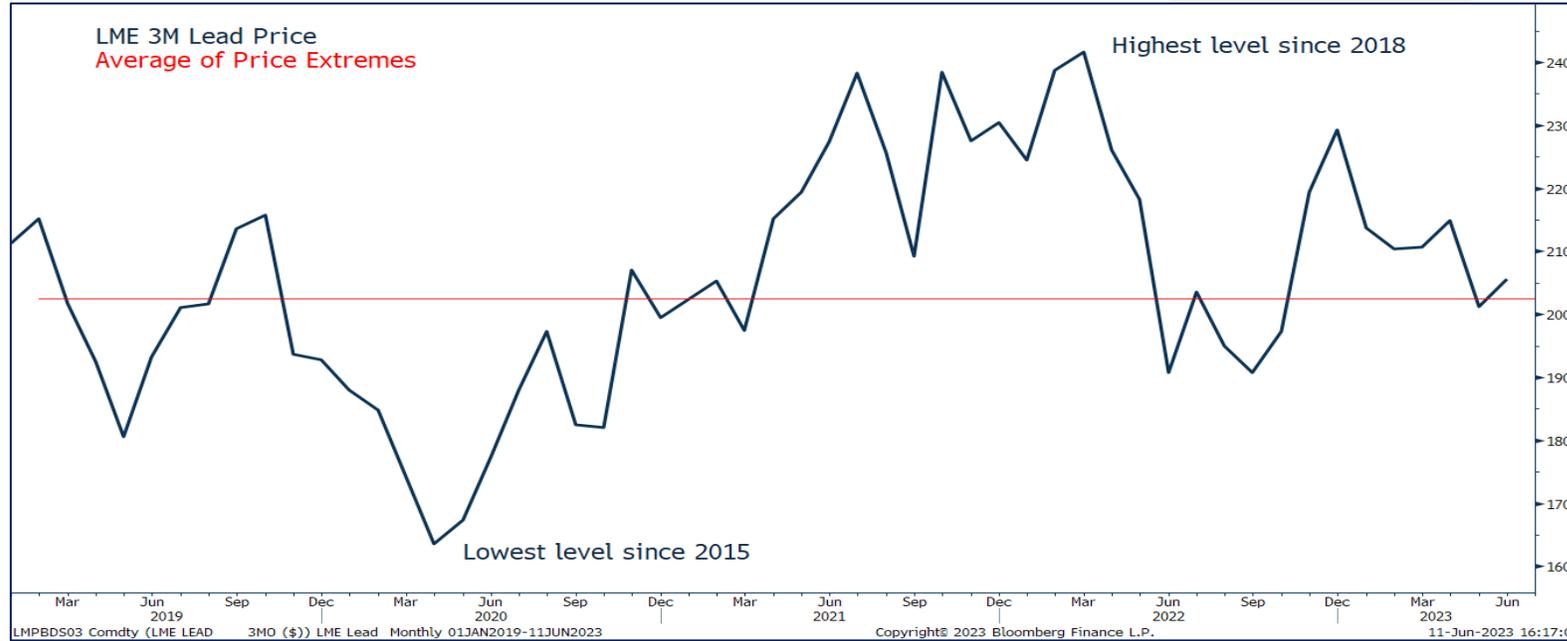
Source for chart: Bloomberg, StoneX

	2019	2020	2021	2022	2023F
Annual Average $/t	2,006	1,837	2,189	2,145	2,078
% Chg Y/Y	-18.8%	-8.4%	19.2%	-2.0%	-3.1%

This table includes predictions/forecasts. Past performance may not be a reliable guide to future performance.
Source for chart: Bloomberg, StoneX

THANK YOU

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