Global Commodities

Northern summer energy demand drives down global commodity availability - in fundamental contrast to the BCOM crunch

2024 *Institutional Investor*
II Global Fixed Income Research Survey
VOTE
Voting Opens July 8th - August 2nd
Please vote for J.P. Morgan (5 stars)

Global Commodities Research

Tracey Allen
(44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc

Natasha Kaneva
(1-212) 834-3175
natasha.kaneva@jpmorgan.com
JPMorgan Chase Bank NA

Priya R Suneja
(91-22) 6157 4721
priya.suneja@jpmchase.com
J.P. Morgan India Private Limited

- **Global commodity inventory availability declined by -0.9% MOM through July to a three-month low of 64.3 days-of-use, from 64.9 days-of-use in June, as rising energy demand through the Northern summer and declining crude & product inventories weighed on availability. On an Ex-China basis (Ex-China CIM), the monitor, which is a proxy for globally tradeable inventories, was stable on the month at 53.2 days-of-use - albeit susceptible to a decline off these levels in future updates according to our Oil Demand and Inventory Tracker.**
- **The BCOM Index suffered a largely non-fundamental decline of -4.5% MOM in July - the largest monthly drop since May 2023. Investor length has been unwound across the complex, amid US election uncertainty, disappointing policy meetings in China, and a moderation in 2H24 global growth (listen to our thoughts here). After the weak July US employment report, our US economist now sees the FOMC cutting by 50bp at both the September and November meetings, followed by 25bp cuts at every meeting thereafter (*Weak jobs to prompt strong Fed action*, Feroli, 2 August).**
- **Energy demand picked up in July in the GCIM through the Northern summer, and crude and product inventories continued to draw, intensifying the decline in the availability. In the Ex-China CIM the July data suggests a slight moderation in demand on the month, however this series was revised higher last month and our high frequency indicators suggest that an upward revision for July is also likely. US natural gas availability declined for a consecutive month, as demand growth outstripped the inventory build. Base metals markets have been under pressure amid positioning unwinds, however availability declined modestly in the GCIM. Base metals availability increased in the Ex-China CIM however, following an increase in nickel deliveries on the LME amid boosted Chinese exports. Agri availability declined through July across all markets except for soybeans in the GCIM, while availability declined across all agri markets in the Ex-China CIM.**
- **On a standardised basis, the July GCIM z-score declined to -0.55 SD, from -0.45 SD in June, while the tradeable commodity inventories z-score increased to -0.51 SD, from -0.52 SD in June.**
- **On a seasonal basis, July monthly inventory availability at the world level typically declines by the most all year at a 5-year average of -1.8% MOM, while the Ex-China CIM typically declines by some -0.6% MOM. The July 2024 GCIM declined at a much slower pace of -0.9% MOM, similarly the Ex-China CIM stability was also contrary to the seasonal norm.**

See page 8 for analyst certification and important disclosures.

This document is being provided for the exclusive use of energynews@bloomberg.net.

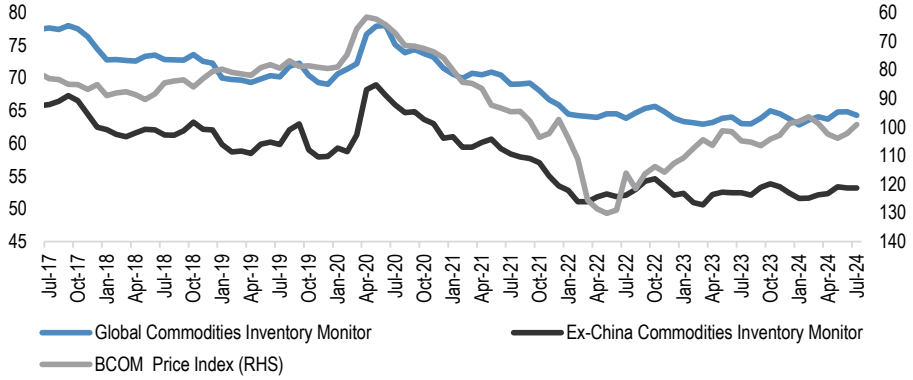
Tracey Allen (44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc
Natasha Kaneva (1-212) 834-3175
natasha.kaneva@jpmorgan.com
Priya R Suneja (91-22) 6157 4721
priya.suneja@jpmchase.com

J.P.Morgan

- **Tradeable commodity stocks remain critically low, and the abundance of available inventories in leading commodity consumer and importer China remains sizeable. Inclusive of exchange, visible commercial inventories, and strategic stockpiles, China currently holds an estimated 92% of global visible copper inventories (-2.1%-pt MOM), 57% of global visible aluminum (2.9%-pt MOM), 68.2% of corn (+0.7%-pt MOM), 51.5% of wheat, 35.4% of soybeans (+2.6%-pt MOM), and 22.5% of crude oil (+0.1%-pt MOM), according to our sources. Chinese SRB holdings alone account for 80% of global copper inventories (-2.1%-pt MOM) and 22% of global aluminium inventories (+0.3%-pt MOM).**
- **All data are available on J.P. Morgan DataQuery, and the series of underlying commodity days of use have been added. API capabilities are also available.**

Figure 1: Global commodity inventory availability declined by -0.9% MOM in July while the Ex-China CIM was flat on the month

LHS: Inventories in days of use; RHS: BCOM Price index (inverted)
Underlying commodity inventories have been converted to days of use and the relevant annual BCOM weighting factor applied to each underlying. BCOM weights recalculated after excluding: Silver, Gold, Live Cattle, Lean Hogs.



Source: Bloomberg Finance L.P., S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research
BCOM Price Index = Quarterly average for historicals and spot for current month

This document is being provided for the exclusive use of energynews@bloomberg.net.

Tracey Allen (44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc
Natasha Kaneva (1-212) 834-3175
natasha.kaneva@jpmorgan.com
Priya R Suneja (91-22) 6157 4721
priya.suneja@jpmchase.com

02 August 2024

Global Commodities Inventory Monitor

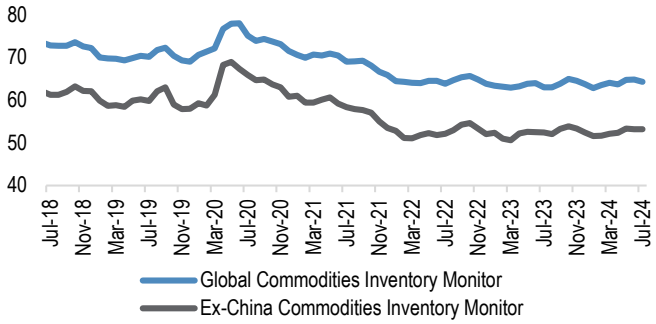
The Global Commodities Inventory Monitor provides an indication of available inventories across the vast global commodities complex based on underlying demand (Figure 1). It is a useful tool when assessing the availability of commodities in aggregate and is derived from 17 underlying energy, metals, and agricultural products (see Methodology and Data input and sources). The GCIM is reported on both a Global and Ex-China basis in days of use (Figure 2), standardised z-score (Figure 4), and by subsector (Figure 5, Figure 6). The annual Bloomberg Commodities Index Target Weights are applied to underlying products to arrive at an aggregated indicator representative of the relative importance of the commodities to the global economy.

Global commodity inventory availability declined by -0.9% MOM through July to a three-month low of 64.3 days-of-use, from 64.9 days-of-use in June, as rising energy demand through the Northern summer and declining crude product inventories weighed on availability. On an Ex-China basis (Ex-China CIM), the monitor, which is a proxy for globally tradeable inventories, was stable on the month at 53.2 days-of-use - albeit susceptible to a decline off these levels according to our Oil Demand and Inventory Tracker.

The BCOM Index suffered a largely non-fundamental decline of -4.5% MOM in July - the largest monthly drop since May 2023. Investor length has been unwound across the complex, amid US election uncertainty, disappointing policy meetings in China, and a moderation in 2H24 global growth (listen to our thoughts here). After the weak July US employment report, our US economist now sees the FOMC cutting by 50bp at both the September and November meetings, followed by 25bp cuts at every meeting thereafter (*Weak jobs to prompt strong Fed action*, Feroli, 2 August).

Figure 2: The Global Commodities Inventory Monitor is reported on both a global and ex-China basis, showing apparent inventories on a days of use basis

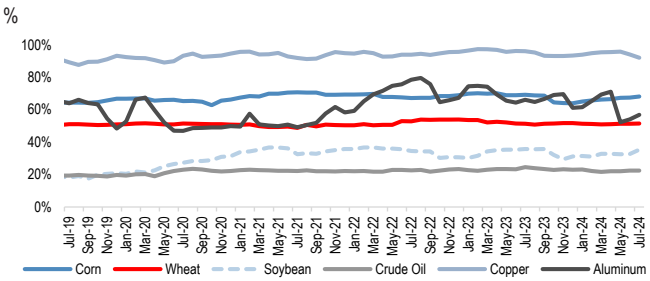
Days of use underlying commodity inventories have been converted to days of use and the relevant monthly BCOM weighting factor applied to each underlying. BCOM weights recalculated after excluding: Silver, Gold, Live Cattle, Lean Hogs.



Source: S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research

The GCIM provides an indication of total global commodity inventories on a demand basis, while the Ex-China CIM provides a guide to inventories available for global trade, stripping out the influence of China's extensive commodity inventories. Inclusive of exchange, visible commercial inventories, and strategic stockpiles, **China currently holds an estimated 92% of global visible copper inventories (-2.1%-pt MOM), 57% of global visible aluminum (2.9%-pt MOM), 68.2% of corn (+0.7%-pt MOM), 51.5% of wheat, 35.4% of soybeans (+2.6%-pt MOM), and 22.5% of crude oil (+0.1%-pt MOM), according to our sources. Chinese SRB holdings alone account for 80% of global copper inventories (-2.1%-pt MOM) and 22% of global aluminium inventories (+0.3%-pt MOM).** As China's inventories are not typically available for world market trade, **the Ex-China monitor is a useful proxy for the relative availability of tradeable commodities for the world market.** The GCIM and Ex-China CIM have broad applications but are most useful when assessing sector-wide inventories, which can help to inform views and trading decisions, amid heightened volatility and geopolitical risks.

Figure 3: China's share of world commodity inventories



Source: Bloomberg Finance L.P. Finance, Kpler, CRU, USDA, various exchanges, J.P. Morgan Commodities Research

This document is being provided for the exclusive use of energynews@bloomberg.net.

Tracey Allen (44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc
Natasha Kaneva (1-212) 834-3175
natasha.kaneva@jpmorgan.com
Priya R Suneja (91-22) 6157 4721
priya.suneja@jpmchase.com

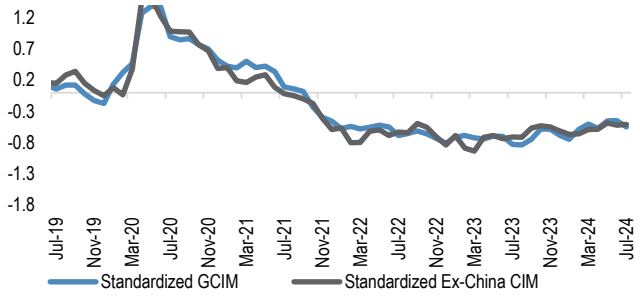
J.P.Morgan

The standardised GCIM and sectoral breakdowns of commodity inventories

Displaying the GCIM based on days of use provides an easy-to-interpret indicator (Figure 1). However, it is also slightly ambiguous, as observations among the 17 underlying commodities are sourced from different data populations. Our preferred method of displaying the GCIM is a z-score (Figure 4). This method standardises the days of use of each underlying commodity, essentially making the data comparable, before applying the BCOM target weighting factor. **At the time of publishing, on a standardised basis, the July GCIM z-score declined to -0.55 SD, from -0.45 SD in June, while the tradeable commodity inventories z-score increased to -0.51 SD, from -0.52 SD in June.**

Figure 4: The Global and Ex-China Commodities Inventory Monitor reported in standardised form

Z-scores of global commodities inventories as days of use

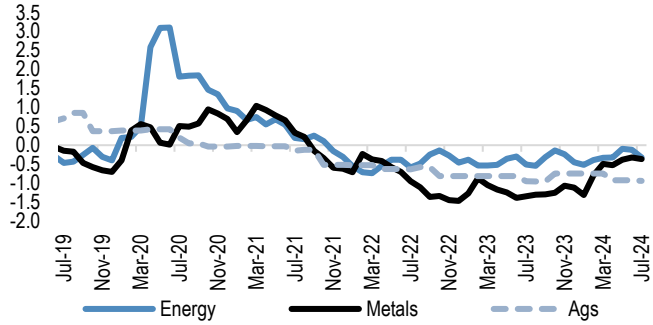


Source: S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan

Energy demand picked up in July in the GCIM through the northern summer, and crude and product inventories continued to draw, intensifying the decline in the availability. In the Ex-China CIM the July data suggests a slight moderation in demand on the month, however this series was revised higher last month and our high frequency indicators suggest that an upward revision for July is also likely. **US natural gas availability declined for a consecutive month**, as demand growth outstripped the inventory build. **Base metals markets have been under pressure amid positioning unwinds, however availability declined modestly in the GCIM**. Base metals availability increased in the Ex-China CIM however, following an increase in nickel deliveries on the LME amid boosted Chinese exports. **Agri availability declined through July** across all markets except for soybeans in the GCIM, while availability declined across all agri markets in the Ex-China CIM.

Figure 5: Sectoral Global Commodities Inventory Monitors

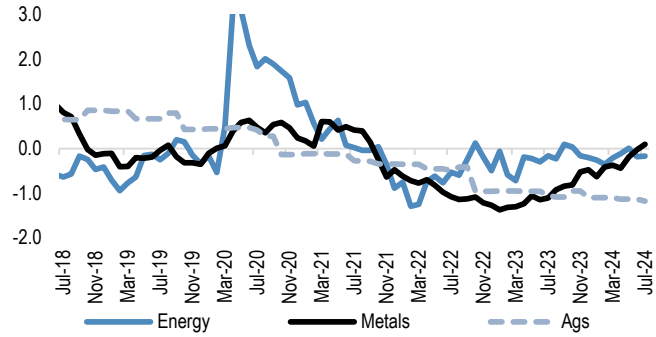
Z-scores of global commodities inventories as days of use



Source: S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research
NB-incorporates historical revisions to standardised metals inventories

Figure 6: Sectoral Ex-China Commodities Inventory Monitors

Z-scores of global commodities inventories as days of use



Source: S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research
NB-incorporates historical revisions to standardized metals inventories

Seasonality of commodity inventories

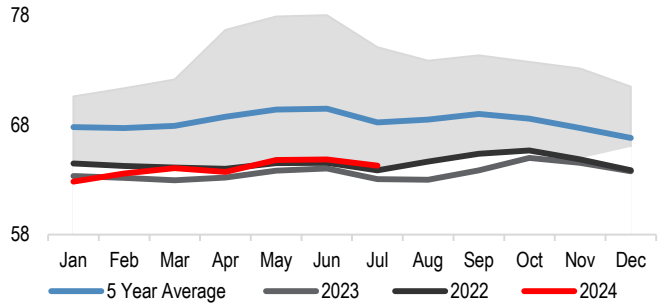
Commodity inventories are inherently seasonal in nature. **On a seasonal basis, July monthly inventory availability at the world level typically declines by the most all year (5-year average decline of -1.8% MOM), while the Ex-China CIM typically declines by some -0.6% MOM. The July 2024 GCIM declined at a much slower pace of -0.9% MOM, similarly the Ex-China CIM stability was also contrary to the seasonal norm** (Figure 7, Figure 8).

This document is being provided for the exclusive use of energynews@bloomberg.net.

Tracey Allen (44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc
Natasha Kaneva (1-212) 834-3175
natasha.kaneva@jpmorgan.com
Priya R Suneja (91-22) 6157 4721
priya.suneja@jpmchase.com

Figure 7: Global commodities inventory seasonality

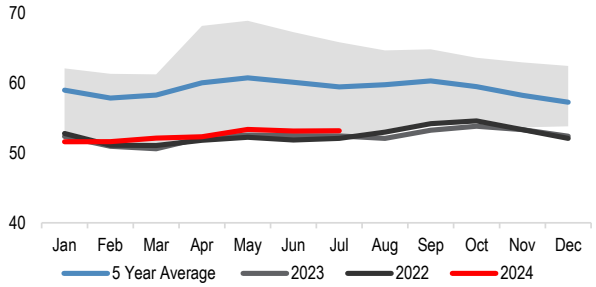
Inventories as days of use



Source: S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research

Figure 8: Ex-China commodities inventory seasonality

Z-scores of global commodities inventories as days of use



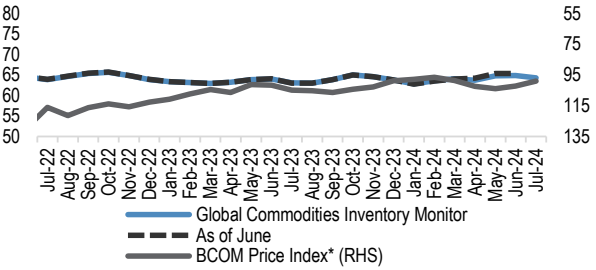
Source: S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research

Data Revisions

In the commodities space, historical data revisions are commonly made and these can alter the index. Historical data revisions were negligible in June (Figure 9, Figure 10). Ex-China oil & product demand was revised higher on the month, reducing the June Ex-China CIM reading slightly.

Figure 9: The Global Commodities Inventory Monitor monthly update

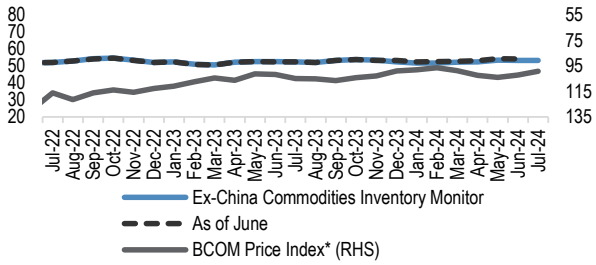
LHS: Inventories in days of use; RHS: BCOM Price index (inverted)



Source: Bloomberg Finance L.P. Finance, S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research

Figure 10: The Ex-China Commodities Inventory Monitor monthly update

LHS: Inventories in days of use; RHS: BCOM Price index (inverted)



Source: Bloomberg Finance L.P., S&P Global Platts, IEA, EIA, USDA, various exchanges, J.P. Morgan Commodities Research

Data Query

All data can be provided through J.P. Morgan DataQuery; API capabilities are also available. Below are the direct links:

Global Commodities Inventory Monitor (GCIM)

GCIM - Ex-China Commodities Inventory Monitor

GCIM - Standardized

GCIM - Standardized Ex-China

GCIM - Energy GCIM Z-Score

GCIM - Ags GCIM Z-score

GCIM - Metals GCIM Z-score

GCIM - Energy Ex-China Z-score

GCIM - Ags Ex-China Z-score

GCIM - Metals Ex-China Z-score

GCIM - Oil Global Inventory Monitor

GCIM - Nat Gas Global Inventory Monitor

GCIM - Cotton Global Inventory Monitor

GCIM - Sugar Global Inventory Monitor

GCIM - Corn Global Inventory Monitor

This document is being provided for the exclusive use of energynews@bloomberg.net.

Tracey Allen (44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc
Natasha Kaneva (1-212) 834-3175
natasha.kaneva@jpmorgan.com
Priya R Suneja (91-22) 6157 4721
priya.suneja@jpmchase.com

J.P.Morgan

GCIM - Wheat Global Inventory Monitor

GCIM - Soybean Oil Global Inventory Monitor

GCIM - Soybean Meal Global Inventory Monitor

GCIM - Soybeans Global Inventory Monitor

GCIM - Coffee Global Inventory Monitor

GCIM - Copper Global Inventory Monitor

GCIM - Aluminum Global Inventory Monitor

GCIM - Nickel Global Inventory Monitor

GCIM - Zinc Global Inventory Monitor

GCIM - Oil Ex-China Inventory Monitor

GCIM - Nat Gas Ex-China Inventory Monitor

GCIM - Cotton Ex-China Inventory Monitor

GCIM - Sugar Ex-China Inventory Monitor

GCIM - Corn Ex-China Inventory Monitor

GCIM - Wheat Ex-China Inventory Monitor

GCIM - Soybean Oil Ex-China Inventory Monitor

GCIM - Soybean Meal Ex-China Inventory Monitor

GCIM - Soybeans Ex-China Inventory Monitor

GCIM - Coffee Ex-China Inventory Monitor

GCIM - Copper Ex-China Inventory Monitor

GCIM - Aluminum Ex-China Inventory Monitor

GCIM - Nickel Ex-China Inventory Monitor

GCIM - Zinc Ex-China Inventory Monitor

Methodology

The GCIM has been compiled based on available inventory data across 17 underlying commodities based on the days of use (2017-present). The annual **BCOM Target Weight** is then applied to each underlying commodity (BCOM weights recalculated after excluding Silver, Gold, Live Cattle, Lean Hogs) to arrive at a representative cross-commodity index of inventories in days of use. We monitor inventories on both a Global and an Ex-China basis to account for inventories that may be locked out of the world market.
See *Global Commodities Inventory Monitor – data inputs and sources*, Allen et al., 25 February 2022, for further details including data sources and relevant tickers.

Data inputs

Energy inventories comprise oil, products, and natural gas

Oil and products: Global oil inventories reflect the sum of crude, gasoline, and diesel (Americas, APAC, Europe, FSU, Middle East, and Africa), Strategic Petroleum Reserves, in-transit, and floating vessels from S&P Global Platts. Demand is Total IEA reflecting available data, with J.P. Morgan estimates thereafter.

Ex-China inventories reflect OECD industrial inventories from IEA reflecting available data, with J.P. Morgan estimates thereafter. Demand is OECD IEA reflecting available data, with J.P. Morgan estimates thereafter.

Inventories are measured in million barrels and demand in million barrels per day, both inventories and demand data are monthly series, and the days of use ratio is calculated as inventory(t)/demand(t).

Natural Gas: Inventories data represent U.S. working natural gas in underground storage from the U.S. Department of Energy's Energy Information Administration and European storage from S&P Global Platts. Working gas is defined as gas available for withdrawal above the level of base gas that is needed to maintain adequate pressure and deliverability rates. The series is estimated weekly from the source while we use these data with a monthly granularity. US demand data are sourced from natural gas consumption from the US Energy Information Administration (EIA). Both inventories and demand are measured in billion cubic feet, the days-of-use ratio is calculated as inventory(t)/demand(t), for which the demand is divided by the number of days in a month.

As only US data are used for natural gas, the methodology and inputs are consistent across both the Global and Ex-China

This document is being provided for the exclusive use of energynews@bloomberg.net.

monitors.

Agriculture: Global inventories reflect the USDA's global inventory and domestic consumption estimates for corn, wheat, soybeans, soybeans oil, soybeans meal, cotton, and coffee while Green Pool's global inventory and domestic consumption estimates are used for sugar. Respective marketing year-level estimates are divided to obtain daily use, and a days-of-use ratio is calculated as inventory(t)/daily use(t). Days of use are replicated across each month for respective international marketing years. Please note that figures for the sugar market for the 2023/24 MY are J.P. Morgan forecasts, i.e., inventory/consumption data starting Apr 2022.

The Ex-China inventory methodology takes the same approach as above, but uses the USDA's world minus China inventory and consumption data for corn, wheat, soybeans, soybeans oil, soybeans meal, cotton, and coffee. We continue to use global data for sugar.

Metals: Metals inventories reflect visible inventories that are tracked via exchange or surveyed in China and that are not necessarily a representation of a full universe; however, they provide a useful proxy.

Global inventories include copper inventories from SHFE, COMEX, LME, SRB, and China Bonded; aluminium inventories from SHFE, COMEX, LME, SRB, and China Regional; nickel inventories from SHFE, LME, Bonded; zinc inventories from SHFE, COMEX, LME, Bonded, and Nanchu; lead inventories from SHFE, LME, and China Regional. Demand for all metals is global, demand's source for metals ex-lead is CRU until 2014 and J.P. Morgan from 2015-YTD. Lead demand is from Wood Mackenzie.

Ex-China inventories include copper inventories from COMEX and LME; aluminium inventories from COMEX and LME; nickel inventories from LME; zinc inventories from COMEX and LME; lead inventories from LME. Demand for all metals is Ex-China, demand source for metals ex-lead is CRU until 2014, and J.P. Morgan over 2015-YTD. Lead demand is from Wood Mackenzie.

Inventories and demand are measured in 1,000 metric tonnes. The days-of-use ratio is calculated as inventory(t)/demand(t), for which the demand is divided by the number of days in a year as demand granularity is annual.

BCOM weighting: Underlying commodity inventory days of use are weighted based on the relevant annual BCOM Target Weight. BCOM weights are recalculated after excluding Silver, Gold, Live Cattle, Lean Hogs. The BCOM weighting is applied to arrive at a representative cross-commodity index of inventories in days of use. The BCOM uses both liquidity data and US dollar–weighted production data in determining the relative quantities of included commodities within the index, to produce representative index of the importance of underlying commodities in the global economy.

This document is being provided for the exclusive use of energynews@bloomberg.net.

Tracey Allen (44-20) 7134-6732
tracey.l.allen@jpmorgan.com
J.P. Morgan Securities plc
Natasha Kaneva (1-212) 834-3175
natasha.kaneva@jpmorgan.com

Priya R Suneja (91-22) 6157 4721
priya.suneja@jpmchase.com

Disclosures

A history of J.P. Morgan investment recommendations disseminated during the preceding 12 months can be accessed on the Research & Commentary page of http://www.jpmorganmarkets.com where you can also search by analyst name, sector or financial instrument.

Analysts' Compensation: The research analysts responsible for the preparation of this report receive compensation based upon various factors, including the quality and accuracy of research, client feedback, competitive factors, and overall firm revenues.

Company-Specific Disclosures: Important disclosures, including price charts and credit opinion history tables, are available for compendium reports and all J.P. Morgan–covered companies, and certain non-covered companies, by visiting https://www.jpmm.com/research/disclosures, calling 1-800-477-0406, or e-mailing research.disclosure.inquiries@jpmorgan.com with your request.

Other Disclosures

J.P. Morgan is a marketing name for investment banking businesses of JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide.

UK MIFID FICC research unbundling exemption: UK clients should refer to UK MIFID Research Unbundling exemption for details of J.P. Morgan's implementation of the FICC research exemption and guidance on relevant FICC research categorisation.

J.P. Morgan Research may, from time to time, write on issuers or securities targeted by economic or financial sanctions imposed or administered by the governmental authorities of the U.S., EU, UK or other relevant jurisdictions (Sanctioned Securities). Nothing in this report is intended to be read or construed as encouraging, facilitating, promoting or otherwise approving investment or dealing in such Sanctioned Securities. Clients should be aware of their own legal and compliance obligations when making investment decisions.

Any digital or crypto assets discussed in this research report are subject to a rapidly changing regulatory landscape. For relevant regulatory advisories on crypto assets, including bitcoin and ether, please see https://www.jpmorgan.com/disclosures/cryptoasset-disclosure.

The author(s) of this research report may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so.

Exchange-Traded Funds (ETFs): J.P. Morgan Securities LLC ("JPMS") acts as authorized participant for substantially all U.S.-listed ETFs. To the extent that any ETFs are mentioned in this report, JPMS may earn commissions and transaction-based compensation in connection with the distribution of those ETF shares and may earn fees for performing other trade-related services, such as securities lending to short sellers of the ETF shares. JPMS may also perform services for the ETFs themselves, including acting as a broker or dealer to the ETFs. In addition, affiliates of JPMS may perform services for the ETFs, including trust, custodial, administration, lending, index calculation and/or maintenance and other services.

Options and Futures related research: If the information contained herein regards options- or futures-related research, such information is available only to persons who have received the proper options or futures risk disclosure documents. Please contact your J.P. Morgan Representative or visit https://www.theocc.com/components/docs/riskstoc.pdf for a copy of the Option Clearing Corporation's Characteristics and Risks of Standardized Options or http://www.finra.org/sites/default/files/Security_Futures_Risk_Disclosure_Statement_2018.pdf for a copy of the Security Futures Risk Disclosure Statement.

Changes to Interbank Offered Rates (IBORs) and other benchmark rates: Certain interest rate benchmarks are, or may in the future become, subject to ongoing international, national and other regulatory guidance, reform and proposals for reform. For more information, please consult: https://www.jpmorgan.com/global/disclosures/interbank_offered_rates

Private Bank Clients: Where you are receiving research as a client of the private banking businesses offered by JPMorgan Chase & Co. and its subsidiaries ("J.P. Morgan Private Bank"), research is provided to you by J.P. Morgan Private Bank and not by any other division of J.P. Morgan, including, but not limited to, the J.P. Morgan Corporate and Investment Bank and its Global Research division.

Legal entity responsible for the production and distribution of research: The legal entity identified below the name of the Reg AC Research Analyst who authored this material is the legal entity responsible for the production of this research. Where multiple Reg AC Research Analysts authored this material with different legal entities identified below their names, these legal entities are jointly responsible for the production of this research. Research Analysts from various J.P. Morgan affiliates may have contributed to the production of this material but may not be licensed to carry out regulated activities in your jurisdiction (and do not hold themselves out as being able to do so). Unless otherwise stated below, this material has been distributed by the legal entity responsible for production. If you have any queries, please contact the relevant Research Analyst in your jurisdiction or the entity in your jurisdiction that has distributed this research material.

Legal Entities Disclosures and Country-/Region-Specific Disclosures:
Argentina: JPMorgan Chase Bank N.A Sucursal Buenos Aires is regulated by Banco Central de la República Argentina ("BCRA"- Central Bank of Argentina) and Comisión Nacional de Valores ("CNV"- Argentinian Securities Commission - ALYC y AN Integral N°51). **Australia:** J.P. Morgan Securities Australia Limited ("JPMSAL") (ABN 61 003 245 234/AFS Licence No: 238066) is regulated by the Australian Securities and Investments Commission and is a Market Participant of ASX Limited, a Clearing and Settlement Participant of ASX Clear Pty Limited and a Clearing Participant of ASX Clear (Futures) Pty Limited. This material is issued and distributed in Australia by or on behalf of

This document is being provided for the exclusive use of energynews@bloomberg.net.

JPMSAL only to "wholesale clients" (as defined in section 761G of the Corporations Act 2001). A list of all financial products covered can be found by visiting https://www.jpmm.com/research/disclosures. J.P. Morgan seeks to cover companies of relevance to the domestic and international investor base across all Global Industry Classification Standard (GICS) sectors, as well as across a range of market capitalisation sizes. If applicable, in the course of conducting public side due diligence on the subject company(ies), the Research Analyst team may at times perform such diligence through corporate engagements such as site visits, discussions with company representatives, management presentations, etc. Research issued by JPMSAL has been prepared in accordance with J.P. Morgan Australia's Research Independence Policy which can be found at the following link: J.P. Morgan Australia - Research Independence Policy. **Brazil**: Banco J.P. Morgan S.A. is regulated by the Comissao de Valores Mobiliarios (CVM) and by the Central Bank of Brazil. Ombudsman J.P. Morgan: 0800-7700847 / 0800-7700810 (For Hearing Impaired) / ouvidoria.jp.morgan@jpmorgan.com. **Canada**: J.P. Morgan Securities Canada Inc. is a registered investment dealer, regulated by the Canadian Investment Regulatory Organization and the Ontario Securities Commission and is the participating member on Canadian exchanges. This material is distributed in Canada by or on behalf of J.P.Morgan Securities Canada Inc. **Chile:** Inversiones J.P. Morgan Limitada is an unregulated entity incorporated in Chile. **China:** J.P. Morgan Securities (China) Company Limited has been approved by CSRC to conduct the securities investment consultancy business. **Dubai International Financial Centre (DIFC)**: JPMorgan Chase Bank, N.A., Dubai Branch is regulated by the Dubai Financial Services Authority (DFSA) and its registered address is Dubai International Financial Centre - The Gate, West Wing, Level 3 and 9 PO Box 506551, Dubai, UAE. This material has been distributed by JP Morgan Chase Bank, N.A., Dubai Branch to persons regarded as professional clients or market counterparties as defined under the DFSA rules. **European Economic Area (EEA):** Unless specified to the contrary, research is distributed in the EEA by J.P. Morgan SE ("JPM SE"), which is authorised as a credit institution by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB). JPM SE is a company headquartered in Frankfurt with registered address at TaunusTurm, Taunustor 1, Frankfurt am Main, 60310, Germany. The material has been distributed in the EEA to persons regarded as professional investors (or equivalent) pursuant to Art. 4 para. 1 no. 10 and Annex II of MiFID II and its respective implementation in their home jurisdictions ("EEA professional investors"). This material must not be acted on or relied on by persons who are not EEA professional investors. Any investment or investment activity to which this material relates is only available to EEA relevant persons and will be engaged in only with EEA relevant persons. **Hong Kong**: J.P. Morgan Securities (Asia Pacific) Limited (CE number AAJ321) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission in Hong Kong, and J.P. Morgan Broking (Hong Kong) Limited (CE number AAB027) is regulated by the Securities and Futures Commission in Hong Kong. JP Morgan Chase Bank, N.A., Hong Kong Branch (CE Number AAL996) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission, is organized under the laws of the United States with limited liability. Where the distribution of this material is a regulated activity in Hong Kong, the material is distributed in Hong Kong by or through J.P. Morgan Securities (Asia Pacific) Limited and/or J.P. Morgan Broking (Hong Kong) Limited. **India**: J.P. Morgan India Private Limited (Corporate Identity Number - U67120MH1992FTC068724), having its registered office at J.P. Morgan Tower, Off. C.S.T. Road, Kalina, Santacruz - East, Mumbai – 400098, is registered with the Securities and Exchange Board of India (SEBI) as a 'Research Analyst' having registration number INH000001873. J.P. Morgan India Private Limited is also registered with SEBI as a member of the National Stock Exchange of India Limited and the Bombay Stock Exchange Limited (SEBI Registration Number – INZ000239730) and as a Merchant Banker (SEBI Registration Number - MB/INM000002970). Telephone: 91-22-6157 3000, Facsimile: 91-22-6157 3990 and Website: http://www.jpmipl.com. JPMorgan Chase Bank, N.A. - Mumbai Branch is licensed by the Reserve Bank of India (RBI) (Licence No. 53/ Licence No. BY.4/94; SEBI - IN/CUS/014/ CDSL : IN-DP-CDSL-444-2008/ IN-DP-NSDL-285-2008/ INBI00000984/ INE231311239) as a Scheduled Commercial Bank in India, which is its primary license allowing it to carry on Banking business in India and other activities, which a Bank branch in India are permitted to undertake. For non-local research material, this material is not distributed in India by J.P. Morgan India Private Limited. Compliance Officer: Spurthi Gadamsetty; spurthi.gadamsetty@jpmchase.com; +912261573225. Grievance Officer: Ramprasadh K, jpmipl.research.feedback@jpmorgan.com; +912261573000.

Investment in securities market are subject to market risks. Read all the related documents carefully before investing. Registration granted by SEBI and certification from NISM in no way guarantee performance of the intermediary or provide any assurance of returns to investors.

Indonesia: PT J.P. Morgan Sekuritas Indonesia is a member of the Indonesia Stock Exchange and is registered and supervised by the Otoritas Jasa Keuangan (OJK). **Korea**: J.P. Morgan Securities (Far East) Limited, Seoul Branch, is a member of the Korea Exchange (KRX). JPMorgan Chase Bank, N.A., Seoul Branch, is licensed as a branch office of foreign bank (JPMorgan Chase Bank, N.A.) in Korea. Both entities are regulated by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS). For non-macro research material, the material is distributed in Korea by or through J.P. Morgan Securities (Far East) Limited, Seoul Branch. **Japan**: JPMorgan Securities Japan Co., Ltd. and JPMorgan Chase Bank, N.A., Tokyo Branch are regulated by the Financial Services Agency in Japan. **Malaysia**: This material is issued and distributed in Malaysia by JPMorgan Securities (Malaysia) Sdn Bhd (18146-X), which is a Participating Organization of Bursa Malaysia Berhad and holds a Capital Markets Services License issued by the Securities Commission in Malaysia. **Mexico**: J.P. Morgan Casa de Bolsa, S.A. de C.V. and J.P. Morgan Grupo Financiero are members of the Mexican Stock Exchange and are authorized to act as a broker dealer by the National Banking and Securities Exchange Commission. **New Zealand**: This material is issued and distributed by JPMSAL in New Zealand only to "wholesale clients" (as defined in the Financial Markets Conduct Act 2013). JPMSAL is registered as a Financial Service Provider under the Financial Service providers (Registration and Dispute Resolution) Act of 2008. **Philippines**: J.P. Morgan Securities Philippines Inc. is a Trading Participant of the Philippine Stock Exchange and a member of the Securities Clearing Corporation of the Philippines and the Securities Investor Protection Fund. It is regulated by the Securities and Exchange Commission. **Singapore**: This material is issued and distributed in Singapore by or through J.P. Morgan Securities Singapore Private Limited (JPMSS) [MCI (P) 030/08/2023 and Co. Reg. No.: 199405335R], which is a member of the Singapore Exchange Securities Trading Limited, and/or JPMorgan Chase Bank, N.A., Singapore branch (JPMCB Singapore), both of which are regulated by the Monetary Authority of Singapore. This material is issued and distributed in Singapore only to accredited investors, expert investors and institutional investors, as defined in Section 4A of the Securities and Futures Act, Cap. 289 (SFA).

This document is being provided for the exclusive use of energynews@bloomberg.net.

This material is not intended to be issued or distributed to any retail investors or any other investors that do not fall into the classes of "accredited investors," "expert investors" or "institutional investors," as defined under Section 4A of the SFA. Recipients of this material in Singapore are to contact JPMSS or JPMCB Singapore in respect of any matters arising from, or in connection with, the material. **South Africa**: J.P. Morgan Equities South Africa Proprietary Limited and JPMorgan Chase Bank, N.A., Johannesburg Branch are members of the Johannesburg Securities Exchange and are regulated by the Financial Services Conduct Authority (FSCA). **Taiwan**: J.P. Morgan Securities (Taiwan) Limited is a participant of the Taiwan Stock Exchange (company-type) and regulated by the Taiwan Securities and Futures Bureau. Material relating to equity securities is issued and distributed in Taiwan by J.P. Morgan Securities (Taiwan) Limited, subject to the license scope and the applicable laws and the regulations in Taiwan. According to Paragraph 2, Article 7-1 of Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers (as amended or supplemented) and/or other applicable laws or regulations, please note that the recipient of this material is not permitted to engage in any activities in connection with the material that may give rise to conflicts of interests, unless otherwise disclosed in the "Important Disclosures" in this material. **Thailand**: This material is issued and distributed in Thailand by JPMorgan Securities (Thailand) Ltd., which is a member of the Stock Exchange of Thailand and is regulated by the Ministry of Finance and the Securities and Exchange Commission, and its registered address is 3rd Floor, 20 North Sathorn Road, Silom, Bangrak, Bangkok 10500. **UK:** Unless specified to the contrary, research is distributed in the UK by J.P. Morgan Securities plc ("JPMS plc") which is a member of the London Stock Exchange and is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. JPMS plc is registered in England & Wales No. 2711006, Registered Office 25 Bank Street, London, E14 5JP. This material is directed in the UK only to: (a) persons having professional experience in matters relating to investments falling within article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) (Order) 2005 ("the FPO"); (b) persons outlined in article 49 of the FPO (high net worth companies, unincorporated associations or partnerships, the trustees of high value trusts, etc.); or (c) any persons to whom this communication may otherwise lawfully be made; all such persons being referred to as "UK relevant persons". This material must not be acted on or relied on by persons who are not UK relevant persons. Any investment or investment activity to which this material relates is only available to UK relevant persons and will be engaged in only with UK relevant persons. Research issued by JPMS plc has been prepared in accordance with JPMS plc's policy for prevention and avoidance of conflicts of interest related to the production of Research which can be found at the following link: J.P. Morgan EMEA - Research Independence Policy. **U.S**.: J.P. Morgan Securities LLC ("JPMS") is a member of the NYSE, FINRA, SIPC, and the NFA. JPMorgan Chase Bank, N.A. is a member of the FDIC. Material published by non-U.S. affiliates is distributed in the U.S. by JPMS who accepts responsibility for its content.

General: Additional information is available upon request. The information in this material has been obtained from sources believed to be reliable. While all reasonable care has been taken to ensure that the facts stated in this material are accurate and that the forecasts, opinions and expectations contained herein are fair and reasonable, JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) make no representations or warranties whatsoever to the completeness or accuracy of the material provided, except with respect to any disclosures relative to J.P. Morgan and the Research Analyst's involvement with the issuer that is the subject of the material. Accordingly, no reliance should be placed on the accuracy, fairness or completeness of the information contained in this material. There may be certain discrepancies with data and/or limited content in this material as a result of calculations, adjustments, translations to different languages, and/or local regulatory restrictions, as applicable. These discrepancies should not impact the overall investment analysis, views and/or recommendations of the subject company(ies) that may be discussed in the material. J.P. Morgan accepts no liability whatsoever for any loss arising from any use of this material or its contents, and neither J.P. Morgan nor any of its respective directors, officers or employees, shall be in any way responsible for the contents hereof, apart from the liabilities and responsibilities that may be imposed on them by the relevant regulatory authority in the jurisdiction in question, or the regulatory regime thereunder. Opinions, forecasts or projections contained in this material represent J.P. Morgan's current opinions or judgment as of the date of the material only and are therefore subject to change without notice. Periodic updates may be provided on companies/industries based on company-specific developments or announcements, market conditions or any other publicly available information. There can be no assurance that future results or events will be consistent with any such opinions, forecasts or projections, which represent only one possible outcome. Furthermore, such opinions, forecasts or projections are subject to certain risks, uncertainties and assumptions that have not been verified, and future actual results or events could differ materially. The value of, or income from, any investments referred to in this material may fluctuate and/or be affected by changes in exchange rates. All pricing is indicative as of the close of market for the securities discussed, unless otherwise stated. Past performance is not indicative of future results. Accordingly, investors may receive back less than originally invested. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. This material may include views on structured securities, options, futures and other derivatives. These are complex instruments, may involve a high degree of risk and may be appropriate investments only for sophisticated investors who are capable of understanding and assuming the risks involved. The recipients of this material must make their own independent decisions regarding any securities or financial instruments mentioned herein and should seek advice from such independent financial, legal, tax or other adviser as they deem necessary. J.P. Morgan may trade as a principal on the basis of the Research Analysts' views and research, and it may also engage in transactions for its own account or for its clients' accounts in a manner inconsistent with the views taken in this material, and J.P. Morgan is under no obligation to ensure that such other communication is brought to the attention of any recipient of this material. Others within J.P. Morgan, including Strategists, Sales staff and other Research Analysts, may take views that are inconsistent with those taken in this material. Employees of J.P. Morgan not involved in the preparation of this material may have investments in the securities (or derivatives of such securities) mentioned in this material and may trade them in ways different from those discussed in this material. This material is not an advertisement for or marketing of any issuer, its products or services, or its securities in any jurisdiction.

Confidentiality and Security Notice: This transmission may contain information that is privileged, confidential, legally privileged, and/or exempt from disclosure under applicable law. If you are not the intended recipient, you are hereby notified that any disclosure, copying,

This document is being provided for the exclusive use of energynews@bloomberg.net.

distribution, or use of the information contained herein (including any reliance thereon) is STRICTLY PROHIBITED. Although this transmission and any attachments are believed to be free of any virus or other defect that might affect any computer system into which it is received and opened, it is the responsibility of the recipient to ensure that it is virus free and no responsibility is accepted by JPMorgan Chase & Co., its subsidiaries and affiliates, as applicable, for any loss or damage arising in any way from its use. If you received this transmission in error, please immediately contact the sender and destroy the material in its entirety, whether in electronic or hard copy format. This message is subject to electronic monitoring: https://www.jpmorgan.com/disclosures/email

MSCI: Certain information herein ("Information") is reproduced by permission of MSCI Inc., its affiliates and information providers ("MSCI") ©2024. No reproduction or dissemination of the Information is permitted without an appropriate license. MSCI MAKES NO EXPRESS OR IMPLIED WARRANTIES (INCLUDING MERCHANTABILITY OR FITNESS) AS TO THE INFORMATION AND DISCLAIMS ALL LIABILITY TO THE EXTENT PERMITTED BY LAW. No Information constitutes investment advice, except for any applicable Information from MSCI ESG Research. Subject also to msci.com/disclaimer

Sustainalytics: Certain information, data, analyses and opinions contained herein are reproduced by permission of Sustainalytics and: (1) includes the proprietary information of Sustainalytics; (2) may not be copied or redistributed except as specifically authorized; (3) do not constitute investment advice nor an endorsement of any product or project; (4) are provided solely for informational purposes; and (5) are not warranted to be complete, accurate or timely. Sustainalytics is not responsible for any trading decisions, damages or other losses related to it or its use. The use of the data is subject to conditions available at https://www.sustainalytics.com/legal-disclaimers. ©2024 Sustainalytics. All Rights Reserved.

"Other Disclosures" last revised July 06, 2024.

Copyright 2024 JPMorgan Chase & Co. All rights reserved. This material or any portion hereof may not be reprinted, sold or redistributed without the written consent of J.P. Morgan. It is strictly prohibited to use or share without prior written consent from J.P. Morgan any research material received from J.P. Morgan or an authorized third-party ("J.P. Morgan Data") in any third-party artificial intelligence ("AI") systems or models when such J.P. Morgan Data is accessible by a third-party. It is permissible to use J.P. Morgan Data for internal business purposes only in an AI system or model that protects the confidentiality of J.P. Morgan Data so as to prevent any and all access to or use of such J.P. Morgan Data by any third-party.

Completed 02 Aug 2024 06:46 PM BST

Disseminated 02 Aug 2024 06:46 PM BST

This document is being provided for the exclusive use of energynews@bloomberg.net.