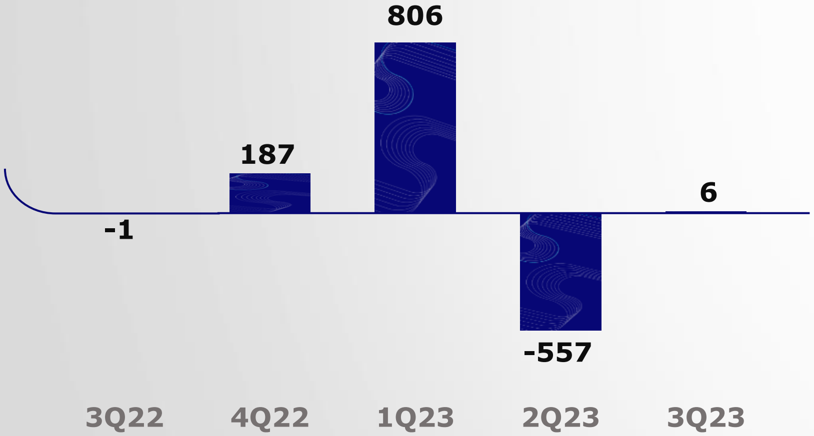
Aluminum Market Report

3Q23

cba

Market nearly balanced in 3Q23, marked by demand growth in China

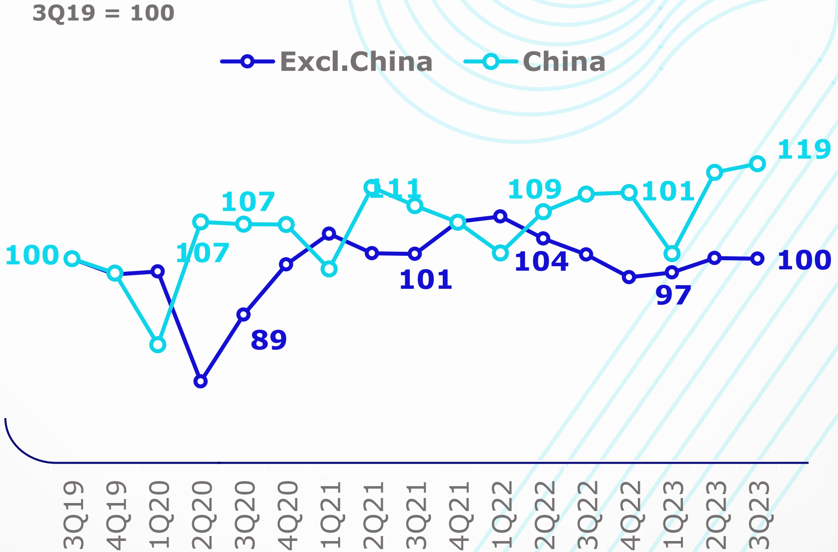
Global Balance[1] (kt) - Supply vs Demand



[1] Balance adjusted for net primary trade

Reduction in surplus estimates for 2023, from ~800kt to ~500kt, due to higher demand in China.

Primary Aluminum Demand

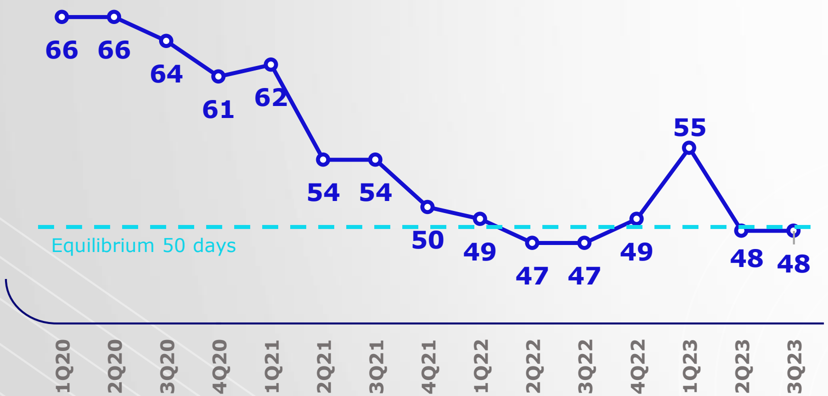


Primary aluminum demand in China grew 1.4% vs. 2Q23, 5.3% higher than the same period last year. On the other hand, the demand excl. China declined by -0.1% q/q and -0.8% y/y.

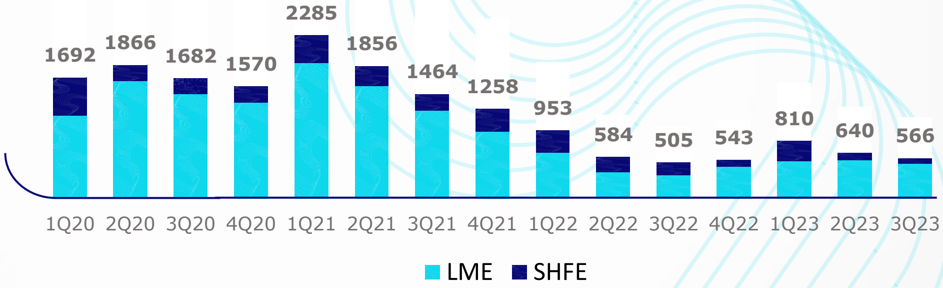
Sources: CRU Aluminum Market Outlook Oct 2023 and Company Analysis.
Note: Historical figures tend to vary depending on the supply & demand model updates made by CRU consulting

Global inventories remain close to equilibrium level. In official warehouses, volumes keep a downward trend

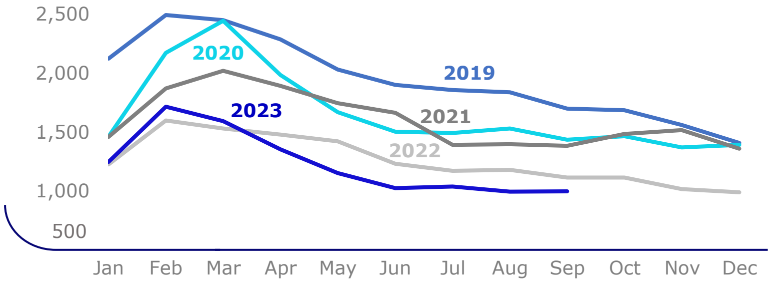
Global stocks in days of consumption



LME and SHFE exchange stocks (kt)



China: SHFE stocks and unregistered warehouse stocks (kt)



Even with smelters restarts in Yunnan, inventory levels in China continued to fall, remaining at levels below previous years.

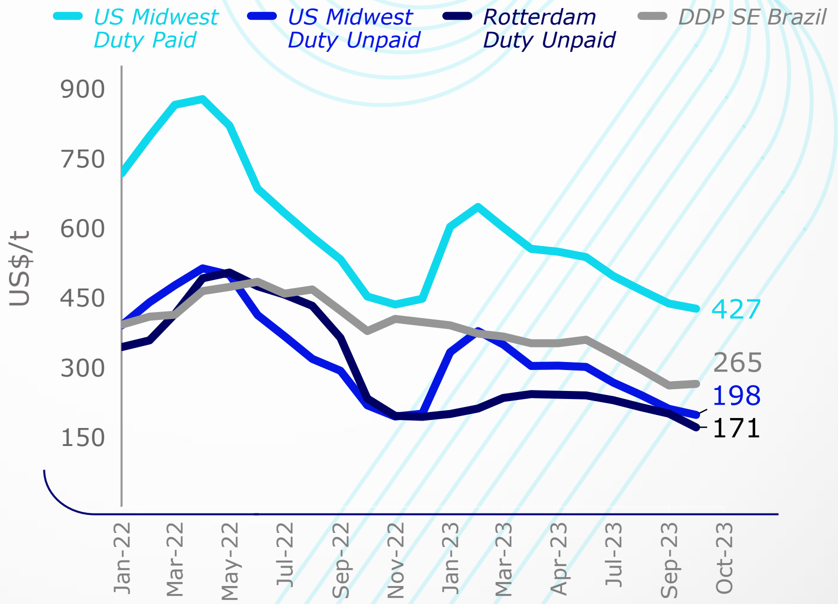
Sources: CRU Aluminum Market Outlook Oct 2023, CRU Aluminum Monitor (Oct 2023) and Company Analysis
Note: Historical figures tend to vary depending on the supply & demand model updates made by CRU consulting

Supply increase in China and weaker demand in other countries put pressure on LME and premiums in the quarter

LME Aluminium down 5% compared to the previous quarter. Concern about the global economy still persists and is also a relevant factor influencing the price

LME Aluminum (US$/t)	3Q22	2Q23	3Q23
	2,354	2,258	2,154

Reduction in regional premiums: since end of the year is looming, consumers are avoiding the risk of inventory increases, due to little visibility of demand



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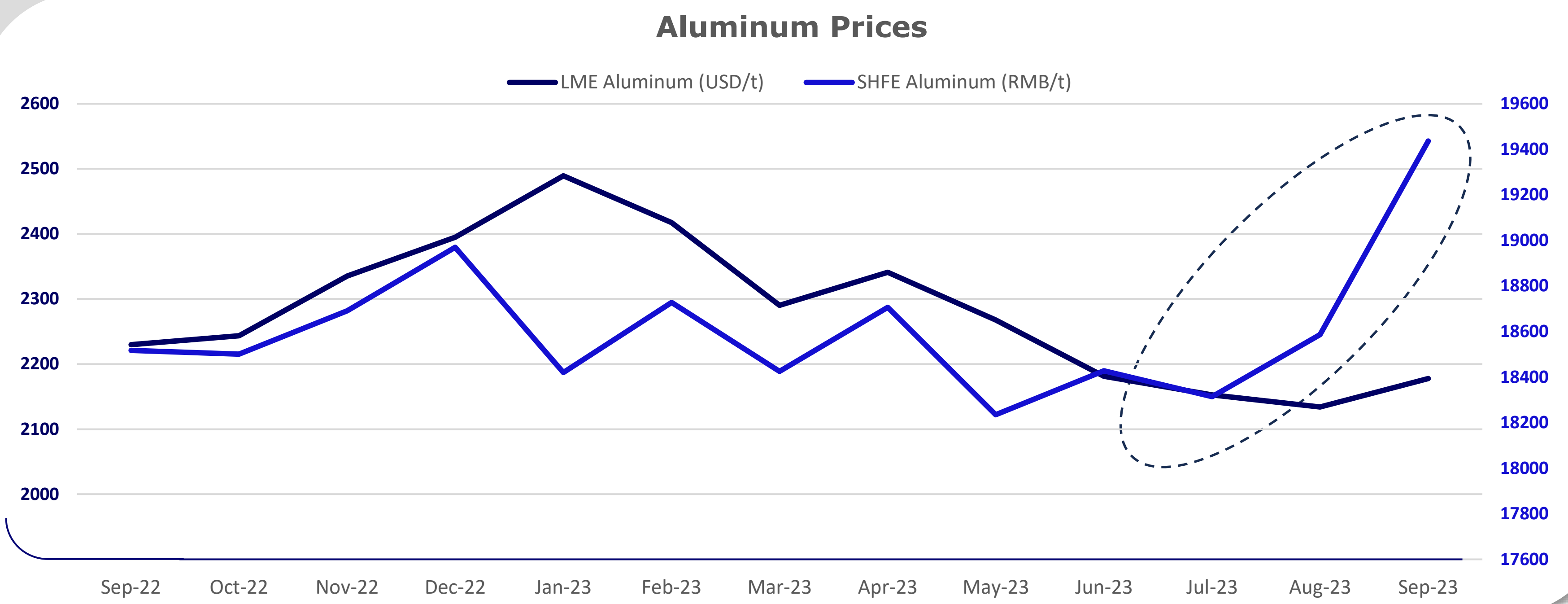
Sources: Bloomberg, CRU Aluminum Market Monitor Oct 2023, S&P Platts and Company Analysis

China: growth in aluminum consumption and continued drop in stocks boosted aluminum price

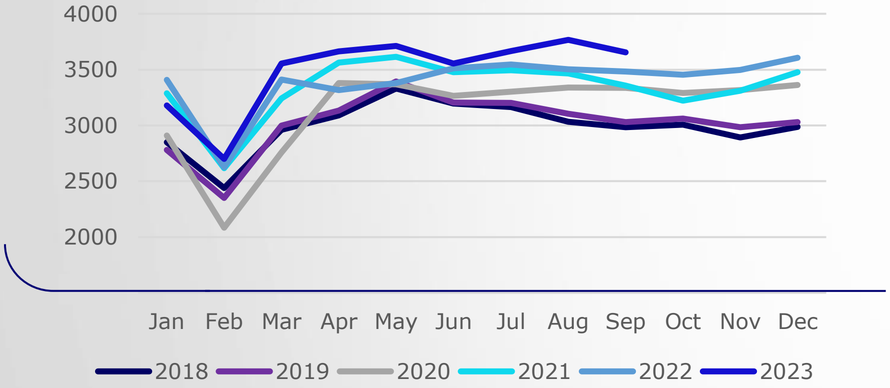


Aluminum Prices	3Q22	4Q22	1Q23	2Q23	3Q23	q/q	y/y
LME (USD/t)	2,354	2,324	2,395	2,258	2,154	-5%	-8%
SHFE (USD/t)	2,689	2,636	2,709	2,633	2,591	-2%	-4%
SHFE (RMB/t)	18,419	18,742	18,527	18,455	18,762	2%	2%

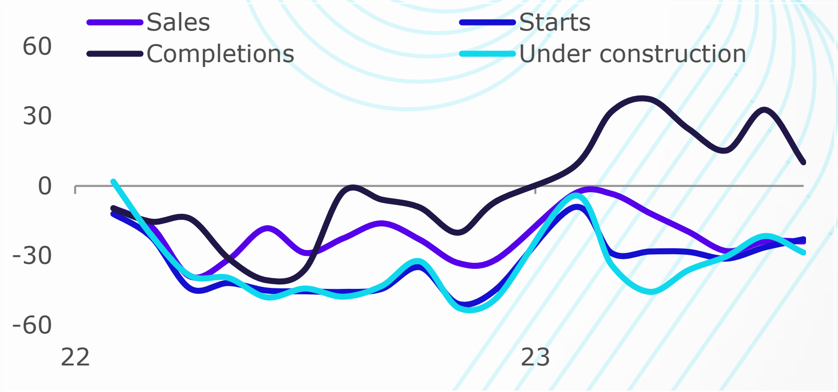
Sources: CRU Aluminum Market Monitor Oct 2023 and Company Analysis

Primary aluminum consumption at historically high level, despite challenges of the construction sector

Primary Aluminum Consumption in China (kt)



Chinese Real Estate Floor Space (% yoy)

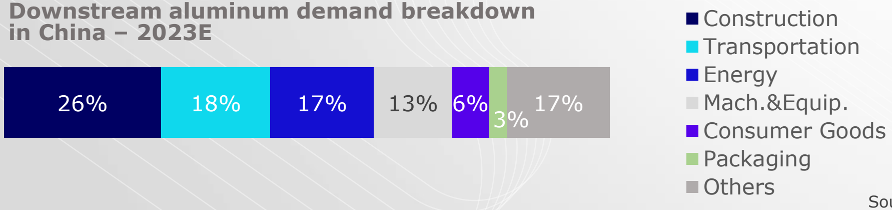


- **Energy** and **transportation** sectors are expected to account for 90% of China's absolute aluminum demand growth in 2023, offsetting the cooling of the construction sector.

- **Real estate** is still a source of concern. The retraction of **new starts** puts aluminum demand at risk in the medium term.

- Favorable arbitrage between LME and SHFE **encourages imports of aluminum by China**. In August, primary aluminum imports increased by **210%** y/y and **31%** m/m. In YTD, imports grew **16%** y/y.

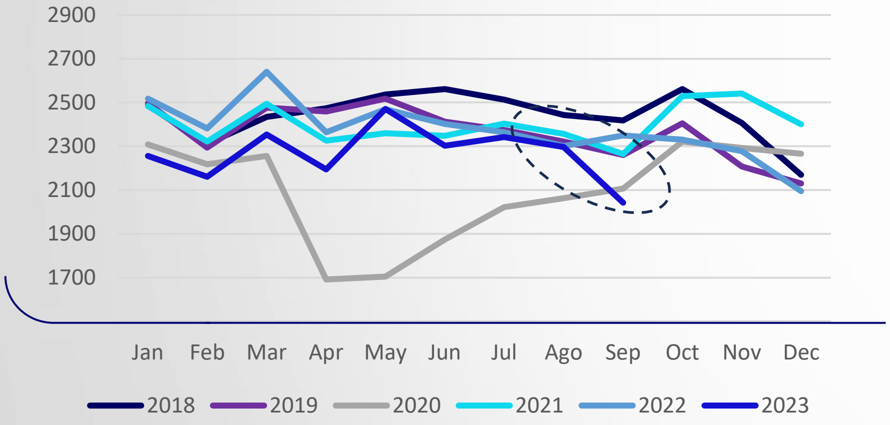
Downstream aluminum demand breakdown in China – 2023E



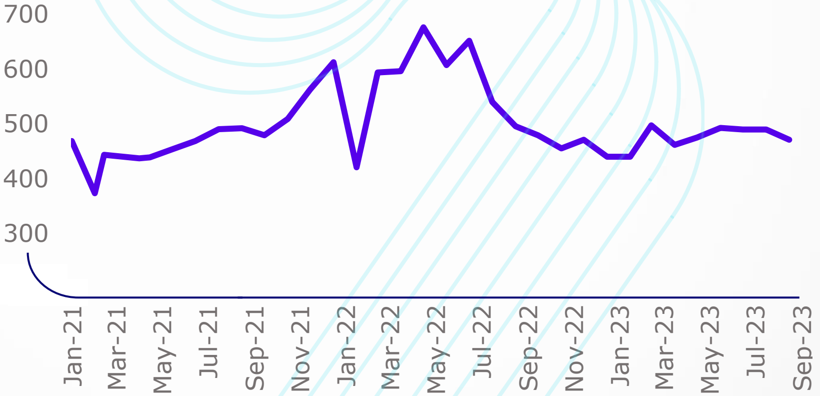
Sources: CRU Aluminum Market Outlook Oct 2023, CRU Aluminum Monitor Oct 2023 and Company Analysis

Decline in primary aluminum consumption in countries excl. China, falling below historical levels in September

Primary aluminum consumption in other countries (excl.China) (kt)



Aluminum products exports from China (kt)



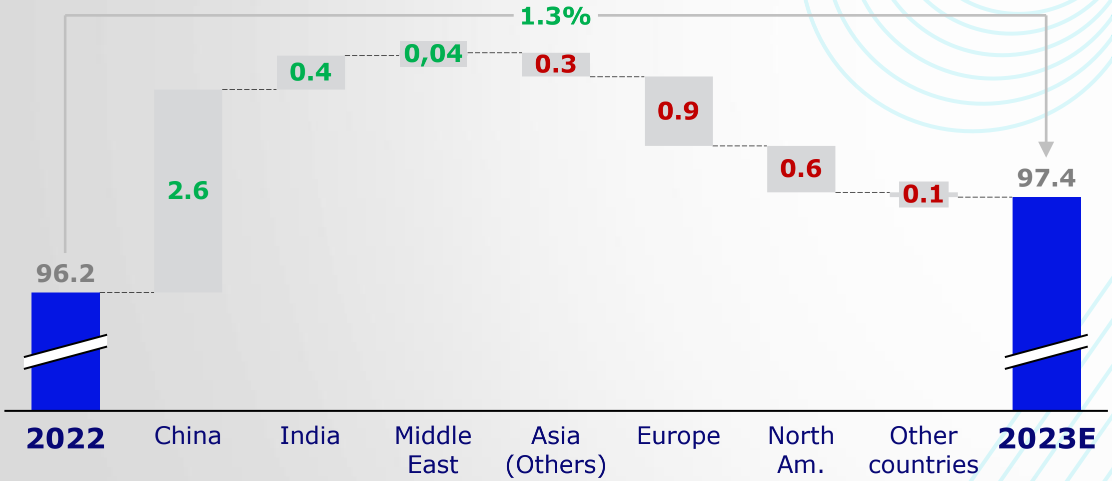
- **Industrial production in Europe and the U.S.** has been sluggish in recent quarters, resulting in lower aluminum demand.
- In addition, according to the CRU consultancy, there is a **destocking** movement in both regions, which limits the entry of new orders.

- From January to September 2023, **exports totaled 4.2 Mt, down 18% y/y,** reflecting **soft demand** from other countries and **increased anti-dumping measures** against Chinese rolled products in the European Union.

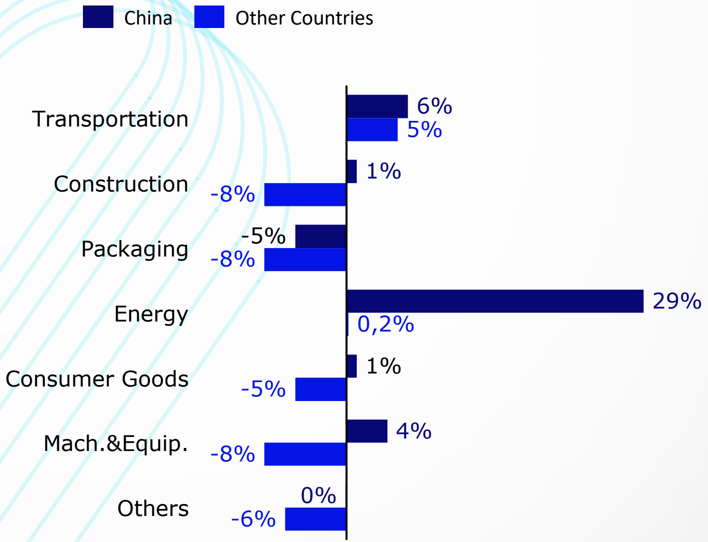
Source: CRU Aluminum Monitor Oct 2023 and Company Analysis

Aluminum consumption expected to grow in 2023, supported by China. Europe and North America will register a drop

Global Downstream Aluminum Demand (Mt)



Global Downstream Aluminum Demand Growth per segment (% yoy)



Still-high energy costs, inflation and rising interest rates have put pressure on demand in Europe. The Eurozone PMI remains below 50, indicating low confidence in the region's economic recovery.

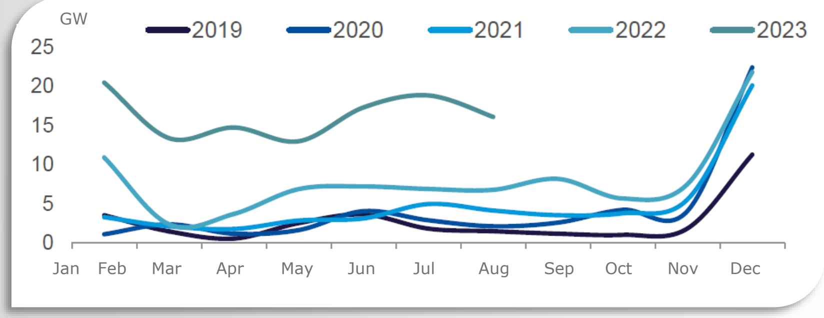
Transportation and Energy segments are expected to be bright spots regarding demand growth in China and other countries in 2023

Source: CRU Aluminum Market Outlook Oct 2023 and Company Analysis

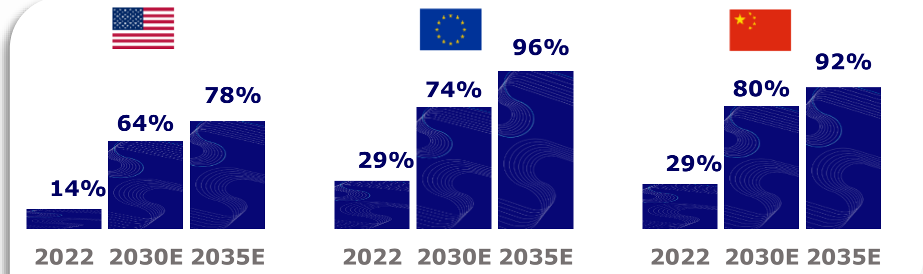
Electrification and solar energy expanding in several regions, including Brazil, with upside potential for aluminum demand

WORLD

China's solar power capacity grows at a fast pace, supporting aluminum demand in 2023



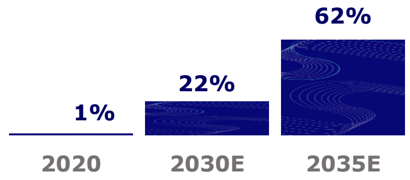
Share of electric and hybrid vehicles in countries' sales mix



Source: Research on the electrification process of the Brazilian automotive supply chain, by BCG, Anfavea and Sindipeças (Aug/23)

BRAZIL

Share of electric and hybrid vehicles in Brazil's sales mix



Source: Research on the electrification process of the Brazilian automotive supply chain, by BCG, Anfavea and Sindipeças (Aug/23)

Strong potential for bus fleet electrification, with participation of local industry

Valor ECONÔMICO

São Paulo começa a operar primeiro lote de 50 ônibus elétricos

É o primeiro passo de um plano que prevê chegar a 2,6 mil veículos até o fim de 2024

Por Carlos Prieto, Valor — São Paulo
18/09/2023 11h18 · Atualizado há um mês

Accelerated growth of solar power capacity in Brazil

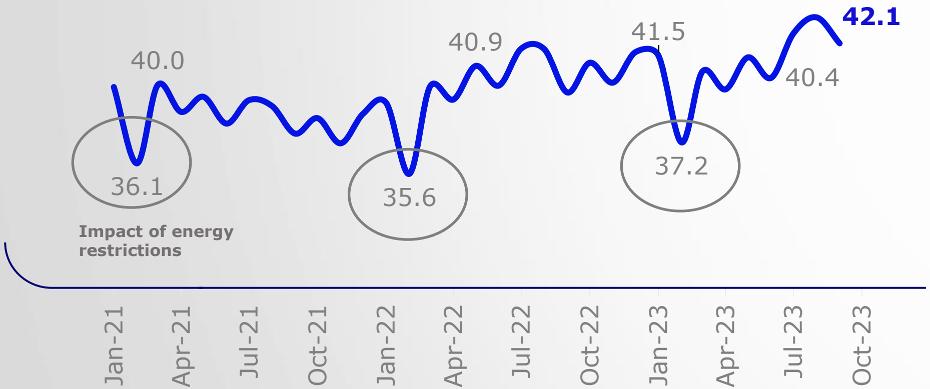
g1

Energia solar no Brasil: uma realidade que não para de crescer

Segunda maior fonte elétrica do país, energia solar bate recordes e se fortalece em empreendimentos comerciais, industriais e residências

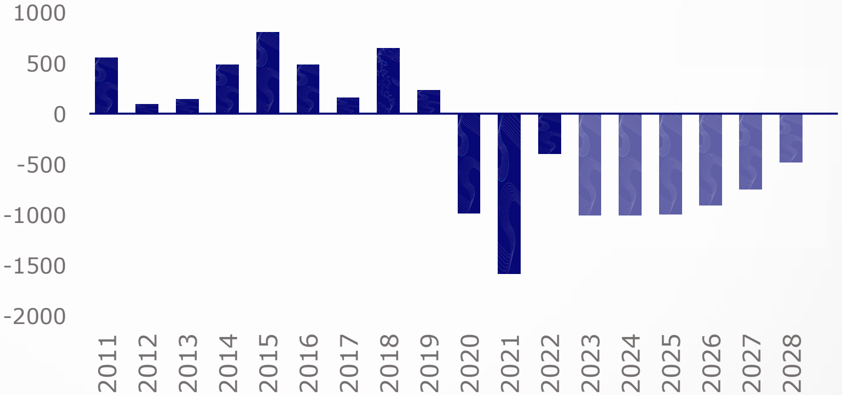
Restarts of smelters in Yunnan led to an increase in annualized production in China

Annualized primary aluminum production in China (Mt)



- Smelters in Yunnan, which had been affected by the energy crisis, **finished restarts in September, adding 2.2 Mt of annualized capacity.**
- Despite this, is expected more than **1Mtpa of temporary closure in primary aluminum production in Yunnan** from November, due to the dry period and the need for energy allocation in the region.

Net exports of primary aluminum by China (Kt)

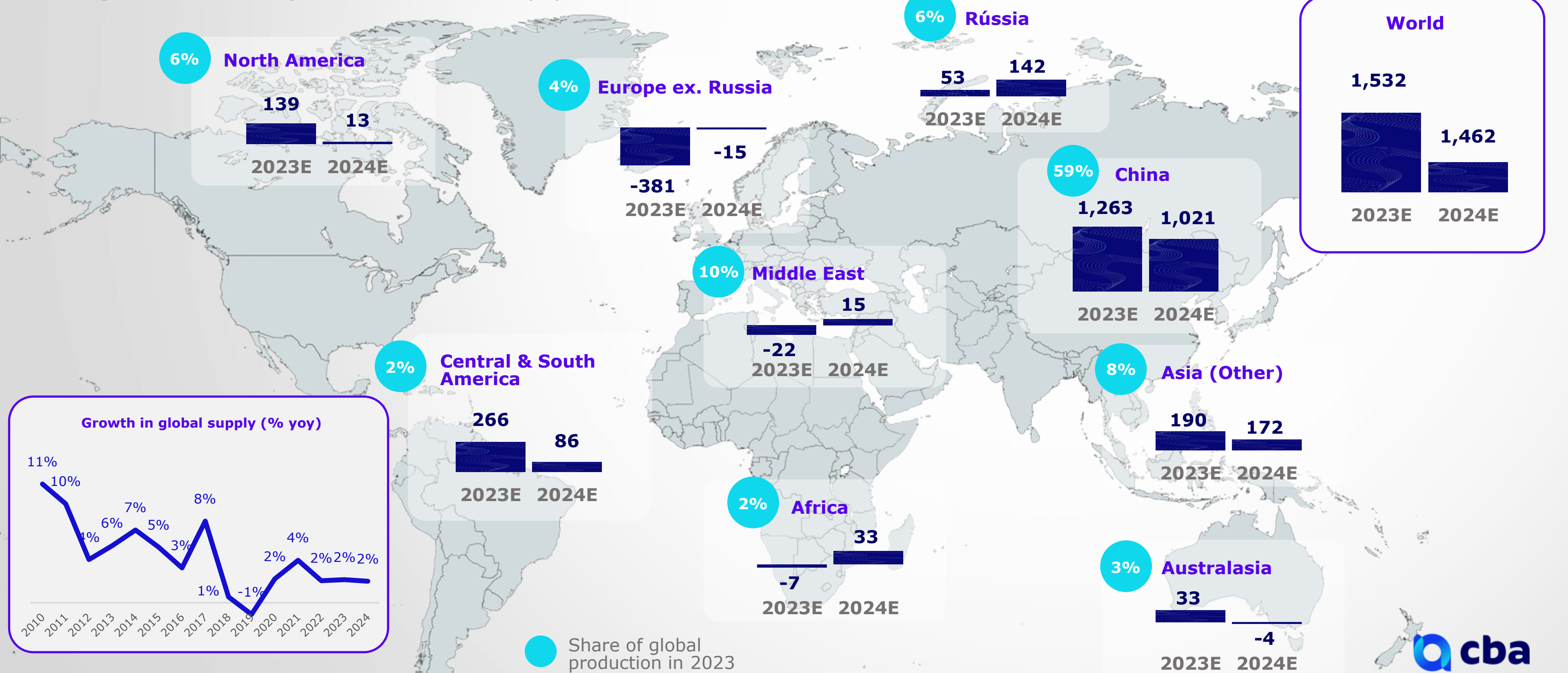


- With a capacity cap of 45Mt, China is expected to **remain a net importer in the coming years**.
- Investments by Chinese players in new smelters in other regions (e.g. Southeast Asia): greater difficulty related to **costs, regulations, resource competition with other industries.**

Source: CRU Aluminum Market Outlook Oct 2023, CRU Aluminum Monitor (Oct 2023) and Company Analysis.

Global supply increase influenced by China. The pace of production growth is declining over the years

Change in Global Primary Aluminum Production (kt)



Source: CRU Aluminum Market Outlook Oct 2023 and Company Analysis

Brazil: demand growth compared to the previous quarter, with emphasis on the Transportation segment

Compared to 3Q22, there was also growth in domestic demand, mainly from the **consumer goods** and **construction** sectors

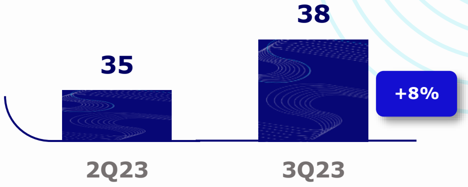
Deceleration of the **packaging** sector compared to last year, mainly due to the performance of the **aluminum can market**

Decline in the domestic premium, following the trend of international premiums. Despite this, in recent quarters it has shown **lower volatility** compared to the other regional premiums.

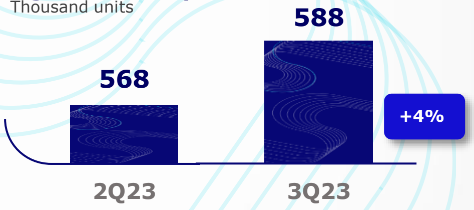
Brazil DDP SE Premium[1] (US$/t)	3Q22	2Q23	3Q23
	450	355	295

Sectoral Indicators

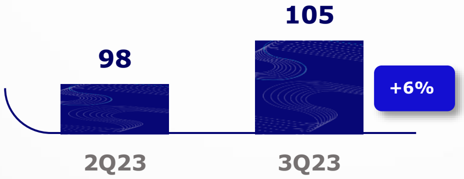
Road implements sales (Anfir)
Thousand units



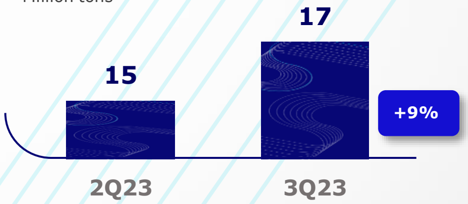
Light vehicles production (Anfavea)
Thousand units



Household appliances production (IBGE)
2022 Avg = 100



Cement consumption (SNIC)
Million tons



[1] Brazil DDP SE Premium: refers to P1020 – standard ingot, sow e T-bars.

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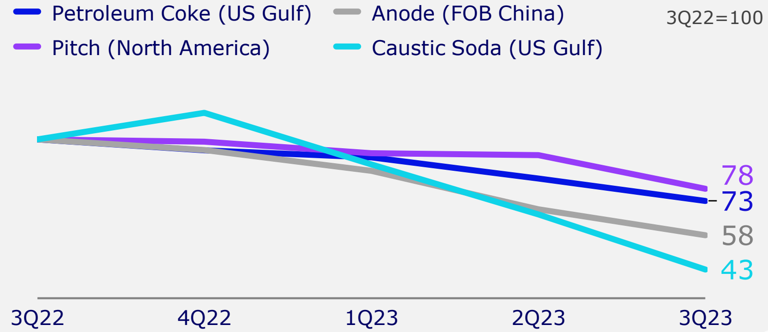
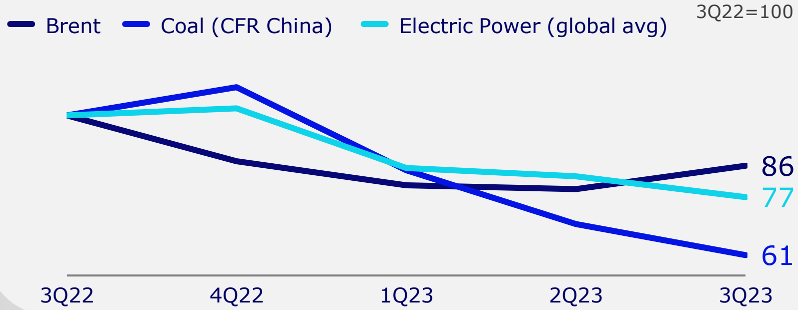
Sources: Brazil DDP SE Premium - S&P Global Platts, sources cited above and Company Analysis

Downward trend continues for most raw material prices, being below the level of 3Q22

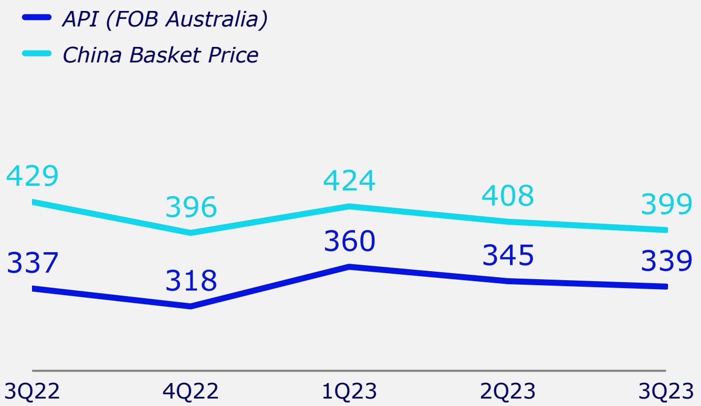
Price Index - Carbon Products and Caustic Soda



Price Index – Power Prices



Alumina Prices (US$/t)



Cooling costs and a relatively balanced market in the quarter resulted in a slight drop in alumina prices in China and other countries compared to 2Q23

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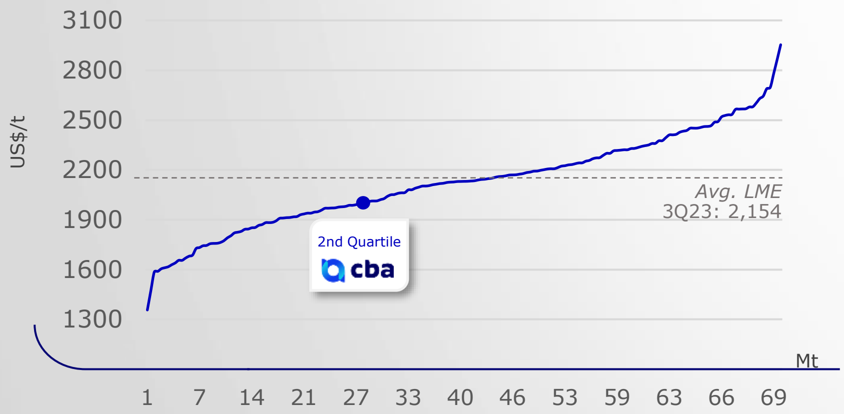
Sources: CRU Aluminium cost dashboard quarterly review (Oct 2023) and Company Analysis

In countries excl. China, smelter margins declined compared to the previous quarter

CBA's competitiveness in the cost curve impacted by specific and exogenous factors, such as pot room's operational instability, costs at still high levels and appreciation of the Real

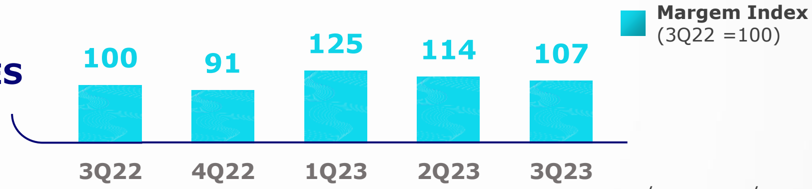
Liquid Metal Cost Curve - 2023

CRU Liquid Metal Cost (US$/t)



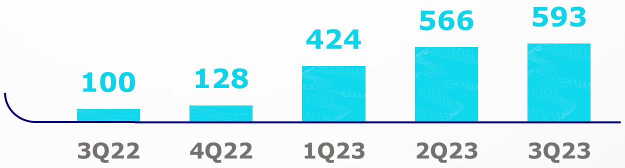
In China, the sharper reduction in costs and the increase in aluminum price (SHFE) benefited smelters' margins

OTHER CONTRIES



	3Q22	4Q22	1Q23	2Q23	3Q23	y/y	q/q
CRU **Alumina** *Price* (FOB Australia) ($/t)	337	318	360	345	339	1%	-2%
Power Price **Hydro** ($/MWh)	33	30	29	28	26	-21%	-3%
Power Price **All sources**($/MWh)	38	36	31	30	28	-22%	-8%

CHINA



	3Q22	4Q22	1Q23	2Q23	3Q23	y/y	q/q
CRU China **Alumina** *Basket Price* ($/t)	429	396	424	408	399	-7%	-2%
Power Price **Coal** ($/MWh)	69	72	57	58	51	-25%	-11%
Power Price **All sources** ($/MWh)	68	70	58	56	53	-22%	-7%

Note: Cash Cost CBA in the cost curve above refers to the 9-month cumulative period

Sources: CRU Aluminium cost dashboard quarterly review (Oct 2023), CRU Aluminium Smelter Cost Model Q3 2023 and Company Analysis

Key Takeaways

Global market nearly balanced in 3Q22. In China, despite the restarts in Yunnan, imports increased and official inventories continued to fall, indicating **growing consumption**. Possible **further capacity closure in Yunnan** in the coming months.

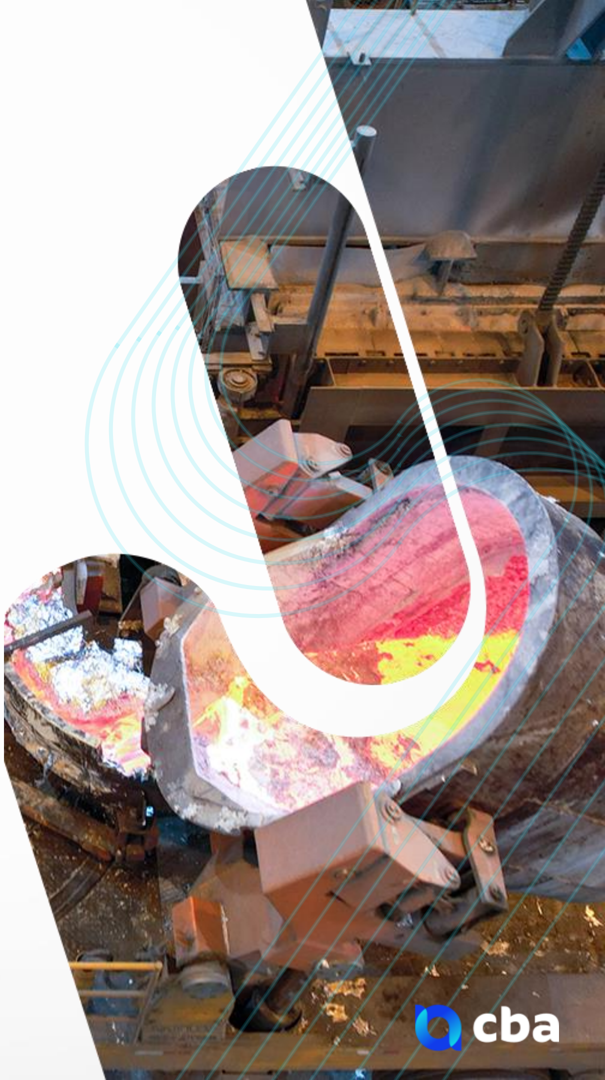
In the other countries, aluminum demand slows down due to the **sluggish performance of the industrial sector**, mainly in the US and Europe

Aluminium LME down 5% quarter-on-quarter, reflecting **concerns about rising supply in China, weaker demand elsewhere and macroeconomic uncertainties**

Regional premiums falling, tracking cooling demand in key regions of the world

Industry costs continue to fall, however, margins of smelters outside China drop due to sharper LME decline. In China, smelters' profitability enhanced by the SHFE Aluminum rise

Brazilian demand grew in the quarter, compared to 2Q23 and 3Q22. Better macroeconomic conditions and seasonality benefited consumption in the country



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