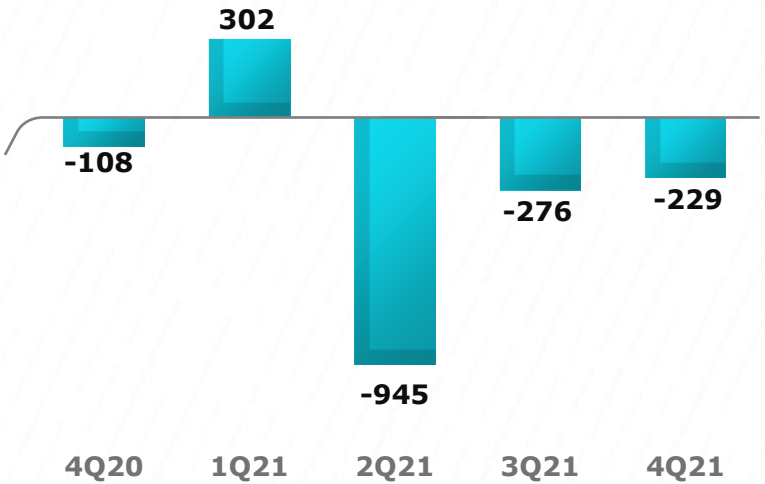
Aluminum Market Outlook

4Q21

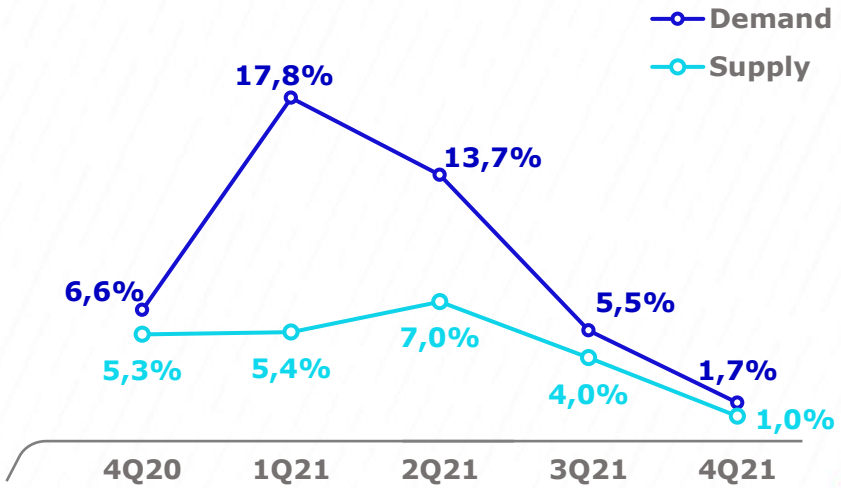
Global aluminum market remains in deficit: demand growing at a faster pace than supply

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



[1] Balance adjusted for net primary trade

Supply and Demand Growth (% YoY)

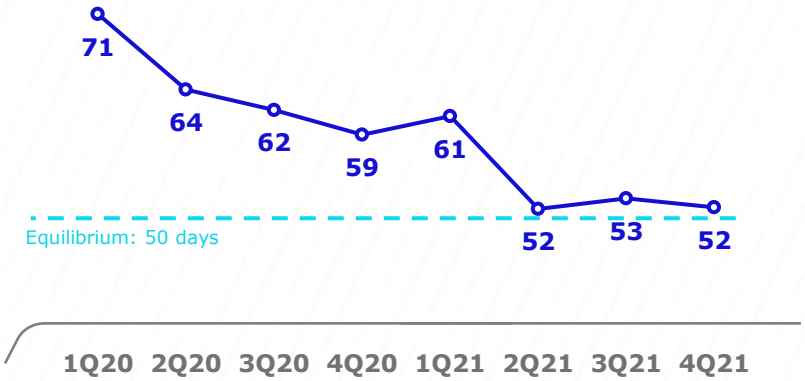


In 2021, the global deficit was -1.1 Mt. In the period, China imported a significant amount of 1.8 Mt of aluminum products, higher than historical volumes (average 2015-2019: 230ktpy)

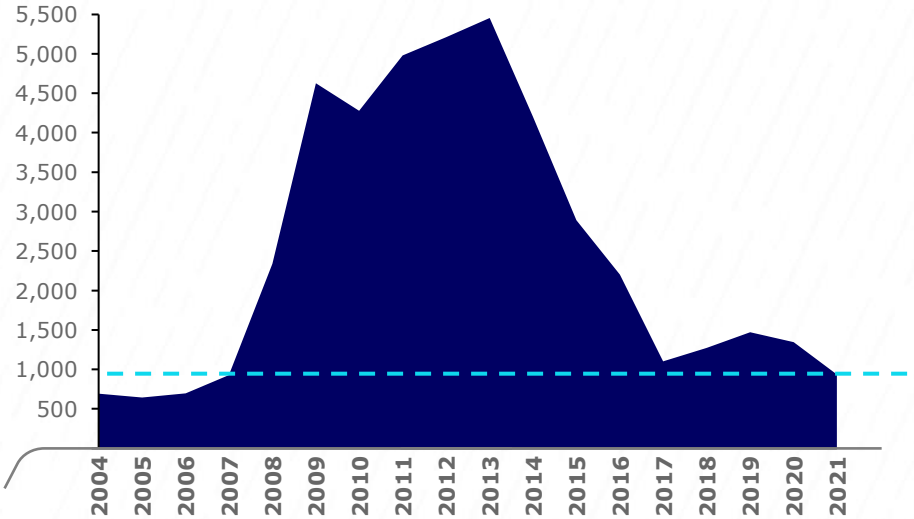
Source: CRU Aluminum Market Outlook Jan 2022 and Company Analysis.
Note: Historical figures tend to vary slightly depending on the supply & demand model updates made by CRU consulting.

Aluminum stocks reaching historically low levels

Total stocks (days of consumption) reaching what is considered to be the equilibrium levels, indicating a potential critical situation in the market



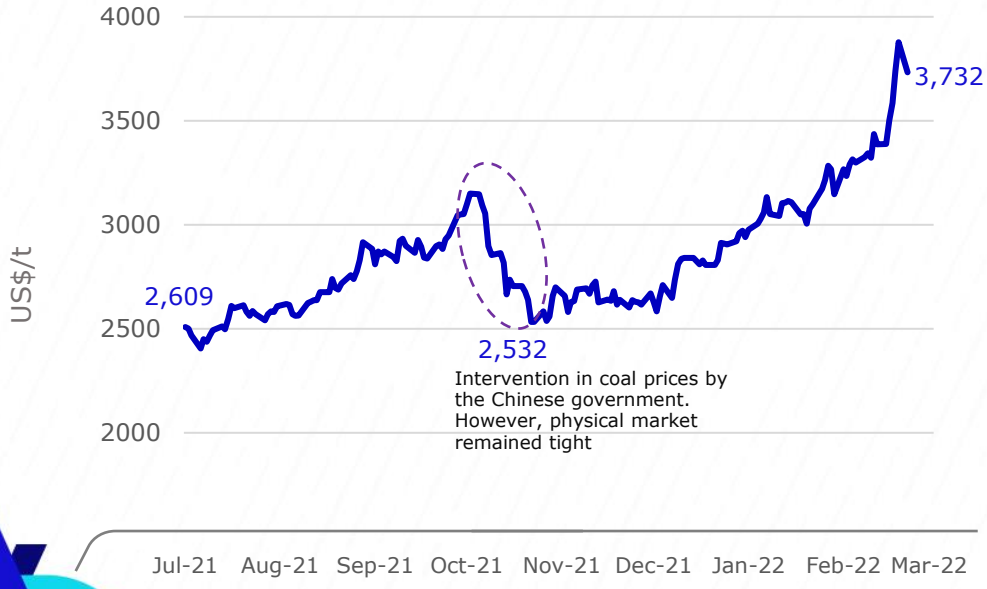
LME stockpiles (kt) sink to levels not seen since 2007



Source: CRU Aluminum Market Outlook Jan 2022 and Company Analysis.
Note: Historical figures tend to vary slightly depending on the supply & demand model updates made by CRU consulting.

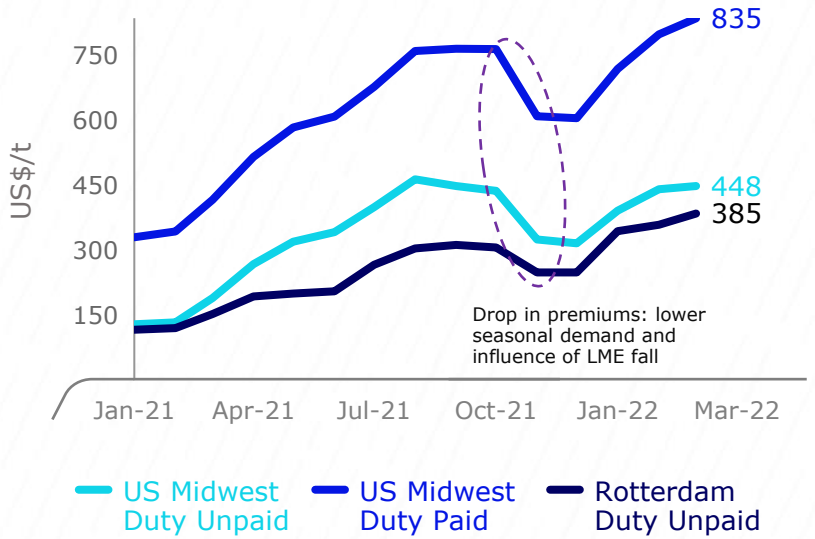
After a decrease in November, LME and premiums continued in an upward trend

LME Aluminium increased 64% since Jan/21



	4Q21	3Q21	4Q21
LME (US$/t)	1,916	2,648	2,762

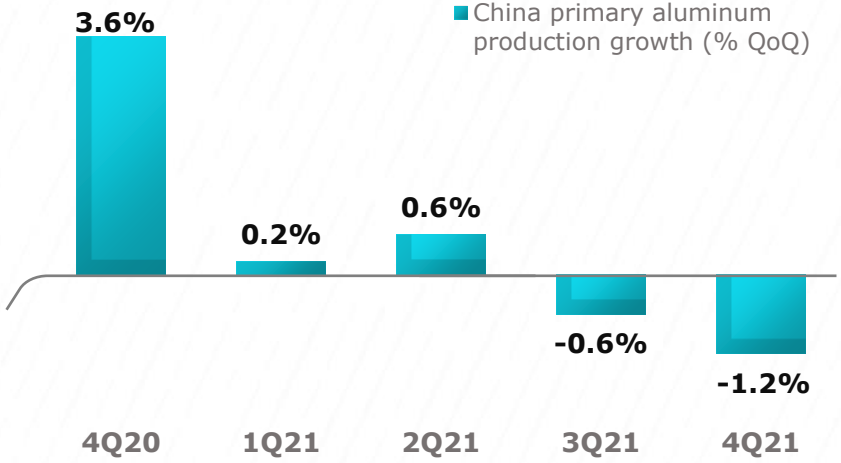
Low inventories, higher logistics costs and firm demand boost premiums



Source: Bloomberg and Company Analysis

Energy crisis in China and Europe resulted in supply restrictions in the quarter

Aluminum production in China declined in the last two quarters

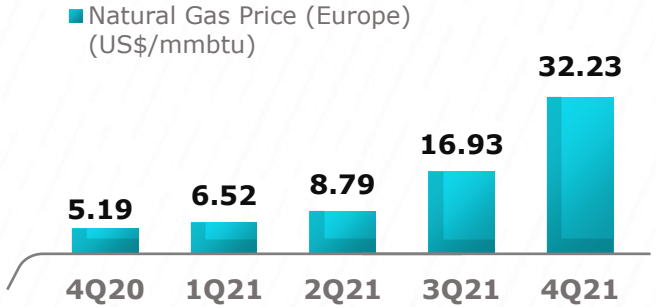


China: dual-control policy (for total and per ton power consumption) and energy crisis resulted in smelter closures of ~3.8Mtpa

Europe: energy crisis leads to production cuts of ~750ktpa (9% of the region's primary aluminum production)

Tensions between Russia and Ukraine increase the risk related to the supply of natural gas to Europe. About 40% of the natural gas consumed in Europe comes from Russia.

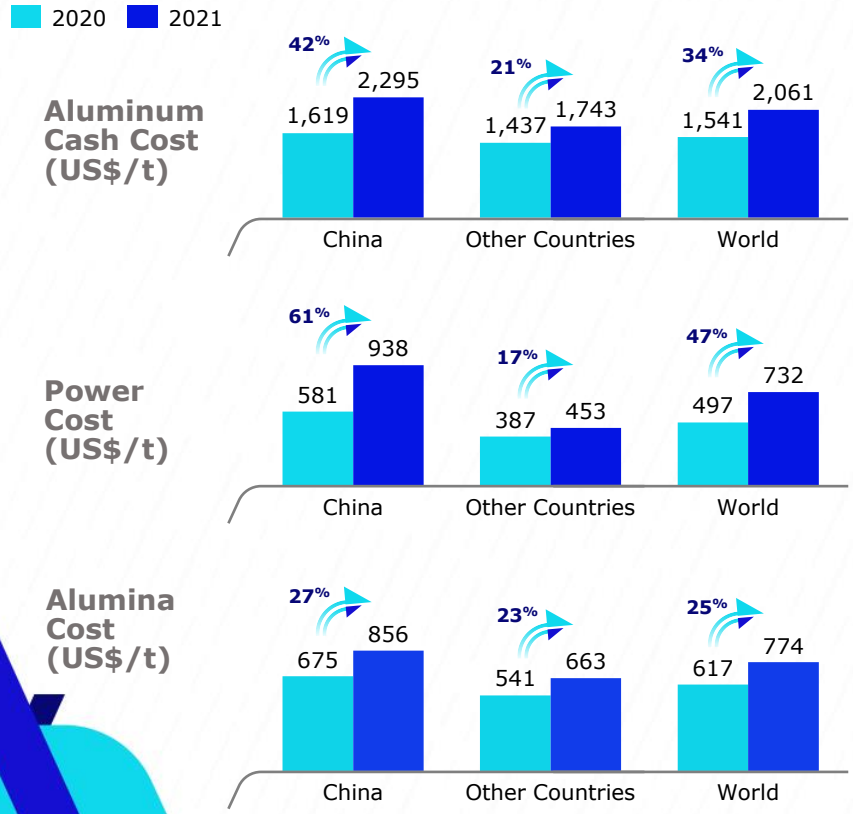
Gas prices are volatile, increasing more than **500%** in the last year



Rising energy costs for European smelters increases the risk of further closures and delays in ramp ups

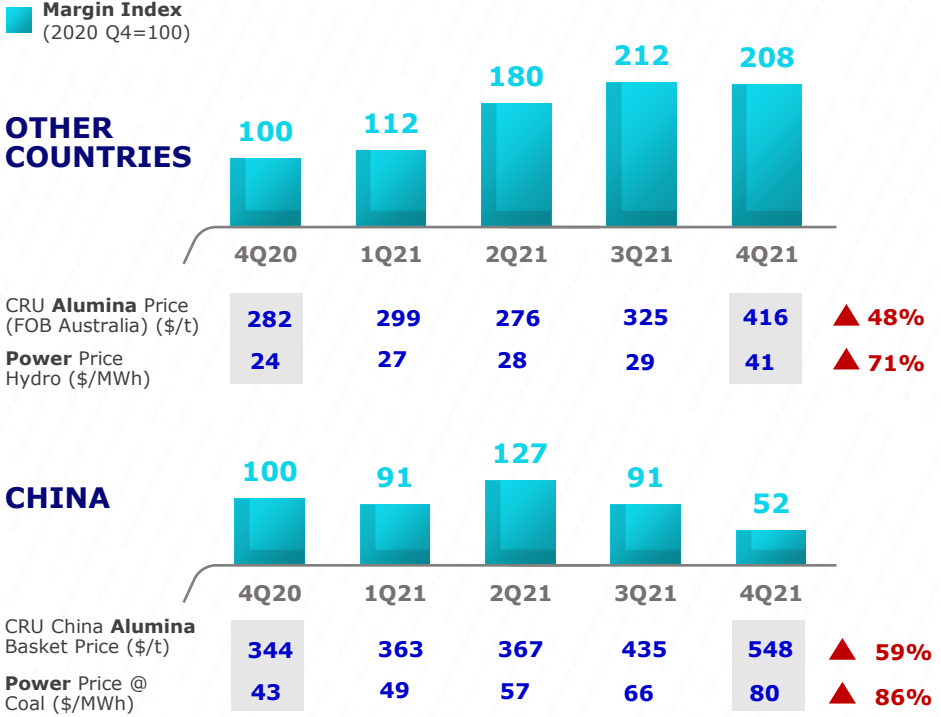
Sources: CRU Aluminum Market Outlook Jan 2022. Natural gas information: Reuters and World Bank

Sharp increase in costs in 2021, mainly for Chinese smelters



Alumina and Power represent approximately 70% of the industry's average cash cost

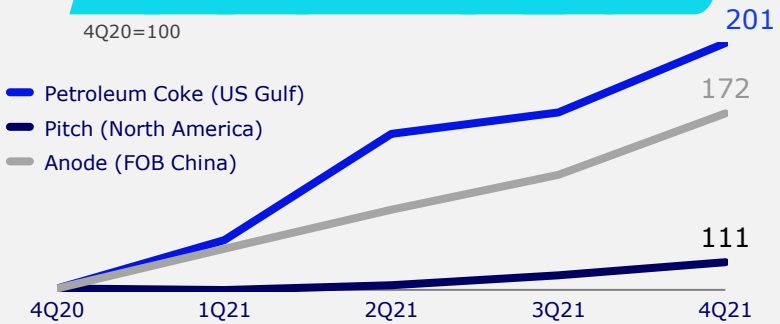
Reduction in Chinese smelters margins, while margins stabilize at higher levels in other countries, even with cost inflation



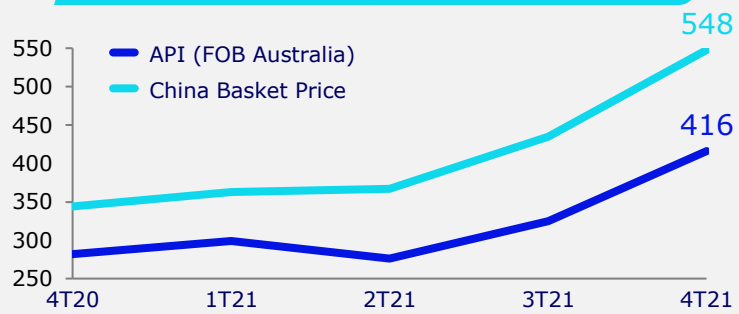
Sources: CRU Smelter Cost Model Q4 2021 e CRU Aluminium cost dashboard quarterly review (Jan 2022)

Inflation in raw material prices, especially alumina

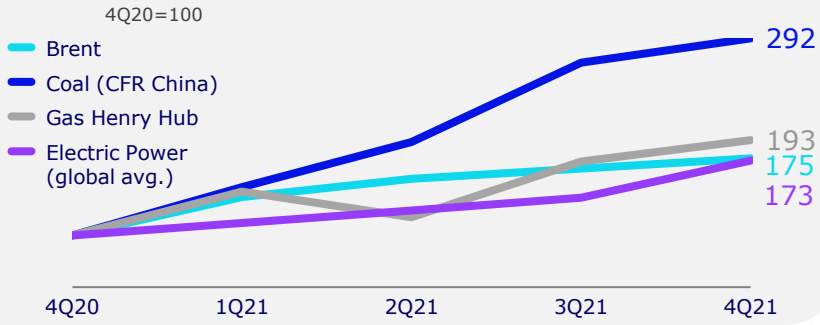
Price Index - Carbon Products



Alumina Prices - US$/t



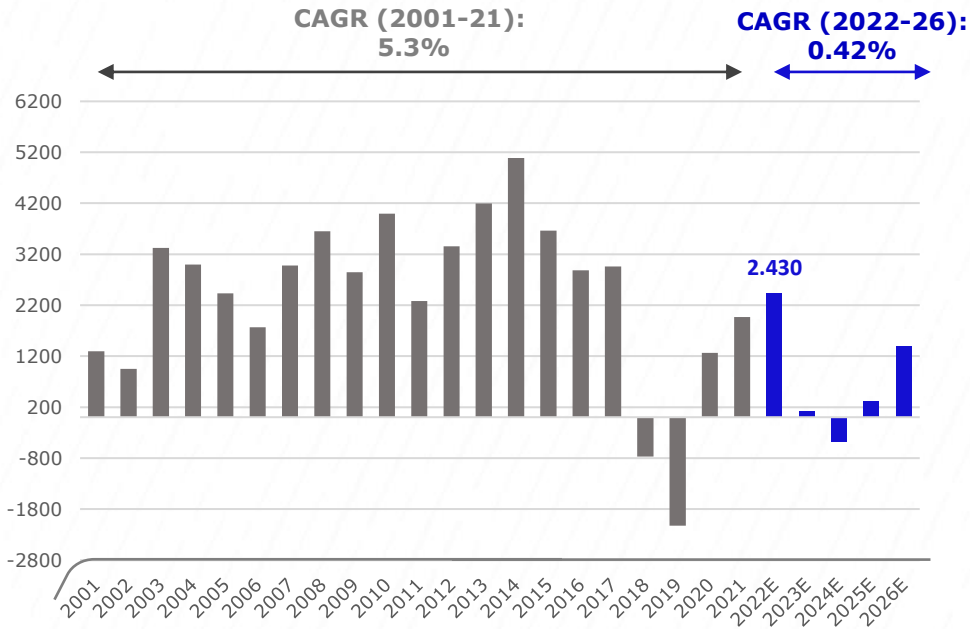
Prices Index – Power Prices



Source: CRU Aluminium cost dashboard quarterly review (Jan 2022)

Smelters restarts are expected in the short term, however, new projects pipeline is limited

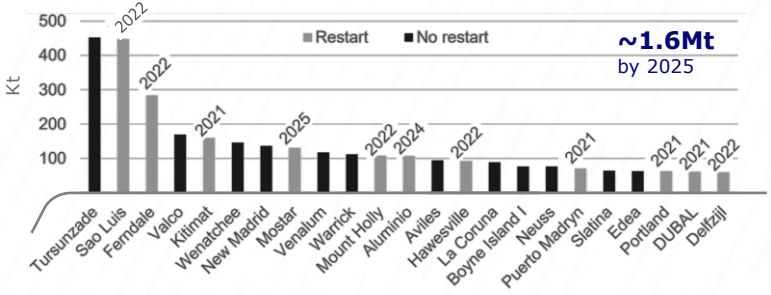
Change in primary aluminum production capacity (kt)



Source: CRU Aluminum Market Outlook Oct 2021/Jan 2022 and Company Analysis

Even with smelters restarts in the USA, Brazil, Oceania and Europe in the short term, physical market should remain tight. CRU estimates a deficit of -1.6Mt in 2022 (vs -1.1Mt in 2021)

Idle capacity[1] in world excl. China and expected/announced restarts by 2025

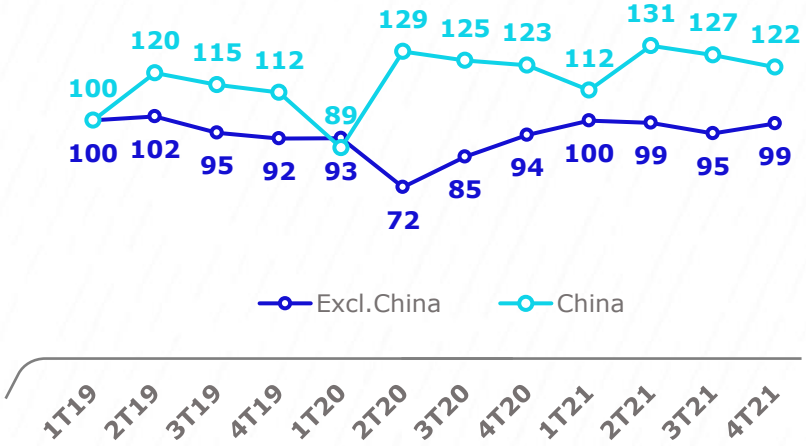


Smaller pipeline: new projects rely on clean energy availability at a competitive price, stable and high LME price in the coming years and China's commitment to its capacity and emissions control policy

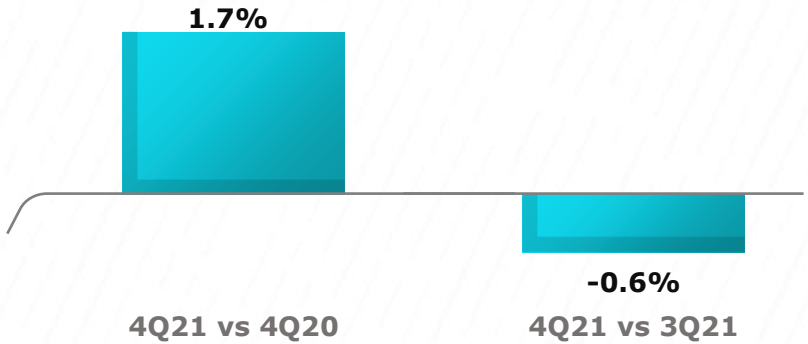
Note(1): Volumes are not included in the chart "Change in primary aluminum production capacity", because they are not additional (new) capacities

Global demand remains at favorable levels, despite a slight slowdown compared to the 3Q21

Primary aluminum demand (1Q19=100)



Primary aluminum demand growth



▼ **China**: softening in the construction market, which accounts for 30% of aluminum demand

▼ **Energy crisis in China** impacted local **downstream producers**, which operated at ~50% utilization in some provinces

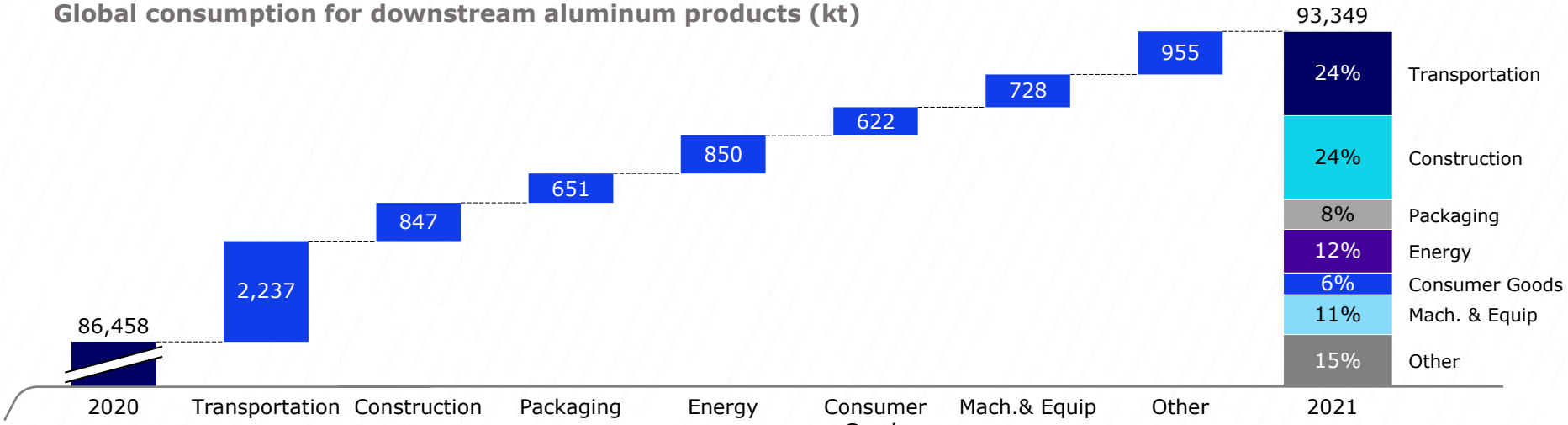
▲ **China's semis aluminum exports hit a record high** in Dec/21 (5.6Mt), which is positive for primary aluminum demand

▲ **Semiconductor crisis** and **shortage of some alloys** (e.g. magnesium and silicon) showing **signs of improvement**

Source: CRU Aluminum Market Outlook Jan 2022

Strong growth in all segments of downstream aluminum products demand

Global consumption for downstream aluminum products (kt)



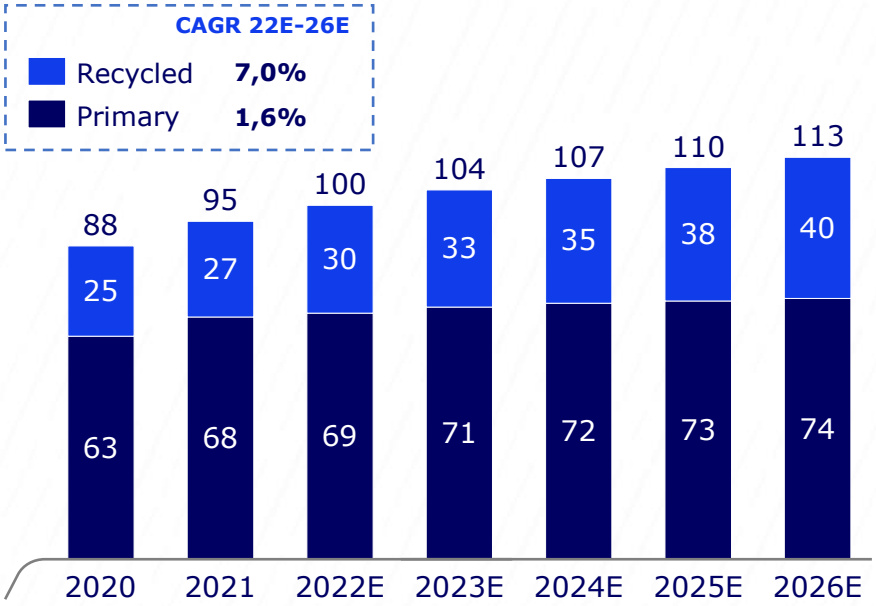
Growth (% YoY)	Transportation	Construction	Packaging	Energy	Consumer Goods	Mach.& Equip	Other	Total
2021	11.3%	4.0%	9.1%	8.0%	12.3%	7.4%	7.5%	12.5%
2020	-13.5%	-1.8%	0.8%	0.5%	-0.7%	-3.4%	0.1%	-3.4%
2015-2019	2.8%	1.3%	4.1%	4.0%	3.9%	4.8%	4.2%	3.1%

Robust demand growth in 2021. Except for Transportation, all other segments outweighed the fall or small growth of the previous year

Source: CRU Aluminum Market Outlook Jan 2022

Demand for recycled aluminum expected to grow at a higher rate than primary demand

Total demand for primary and recycled aluminum (Mt)

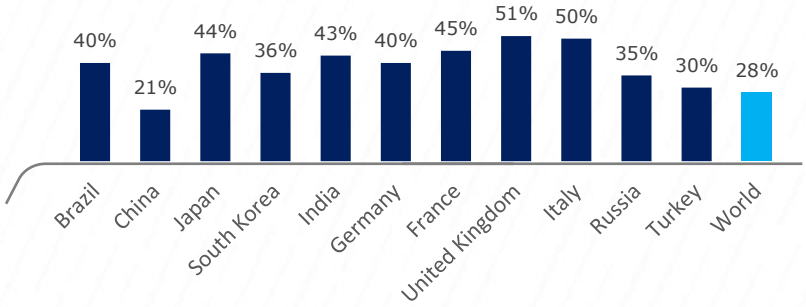


Recicled Share (%)	29	28	30	32	33	34	35

There was a 3pp increase in recycled share in 2026 compared to the July/21 forecast

- **New investments announced in 2021 around the world: China, South Korea, Americas**
- **Capex of recycling plants tends to be significantly lower than the capex of a brownfield smelter**

Recycled Aluminum Share in Total Demand 2021 (%)

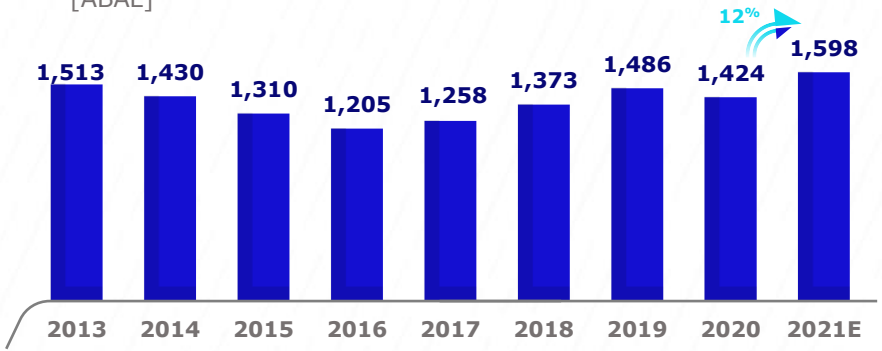


- **Brazil is globally well-positioned in aluminum recycling, mainly aluminum cans. However, there are still opportunities to improve recycling of other products**

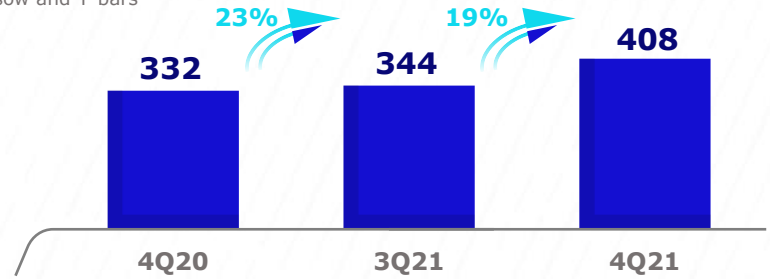
Source: CRU Aluminum Market Outlook Jan 2022 and Company Analysis

Brazil: positive market dynamics, with record aluminum consumption in 2021

Brazillian Aluminum demand (Kt)
[ABAL]



Firm demand lifts regional premium:
Brazil DDP SE US$/t [S&P Global Platts]
P1020: standard ingot, sow and T-bars



4Q21

- End of government financial assistance and returning of activities reduced the pace of aluminum demand, mainly in **consumer goods** and **self-construction**
- Good performance in **transportation**, with highlight on increased production of **heavy duty vehicles**:
  - **Trucks:** e-commerce deliveries, mining, agribusiness
  - **Buses:** market recovery due to the return of routines, as the vaccination gained impetus
- **Packaging** (excluding cans): stable consumption. The flexible packaging subsegment delivered strong performance in the period

2021

- ABAL estimates that aluminum demand grew **12%** in 2021, registering a **record consumption** of 1,598 kt, higher than the peak reached in 2013

Sources: ABAL Website and Revista Alumínio. Premium: S&P Global Platts.

Key Takeaways

- **Global market in deficit** with stocks declining, close to what are considered as equilibrium levels, indicating a potential critical situation in the market
- **Energy crisis in Europe and China** led to smelter capacity closures of ~4.5Mtpa in 2021, some on a temporary basis
- **LME Aluminum** increased 4% in 4Q21 versus 3Q21. Compared to 4Q20, the increase is 44%
- Lower seasonal demand pressured premiums in November. However, upward trends soon recovered, supported by **low inventories and higher logistics costs**
- Global demand: despite a slight slowdown in 4Q21 vs 3Q21, **consumption continues at healthy levels**
- **Brazil:** demand cooling in some sectors in 4Q21, however, **in 2021 consumption is expected to reach an all-time high**, according to ABAL estimates
- **Global cost inflation** hits the entire industry, with greater impact in China due to the energy crisis. **Integrated producers such as CBA are less exposed to exogenous cost pressures**