



The growing importance of recycled aluminium in a carbon constrained world

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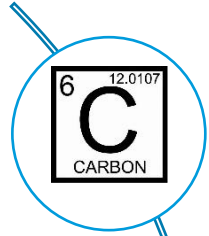


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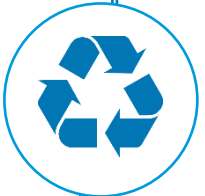
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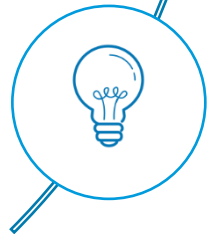
Why is carbon constrained?



What does this mean for primary aluminium?

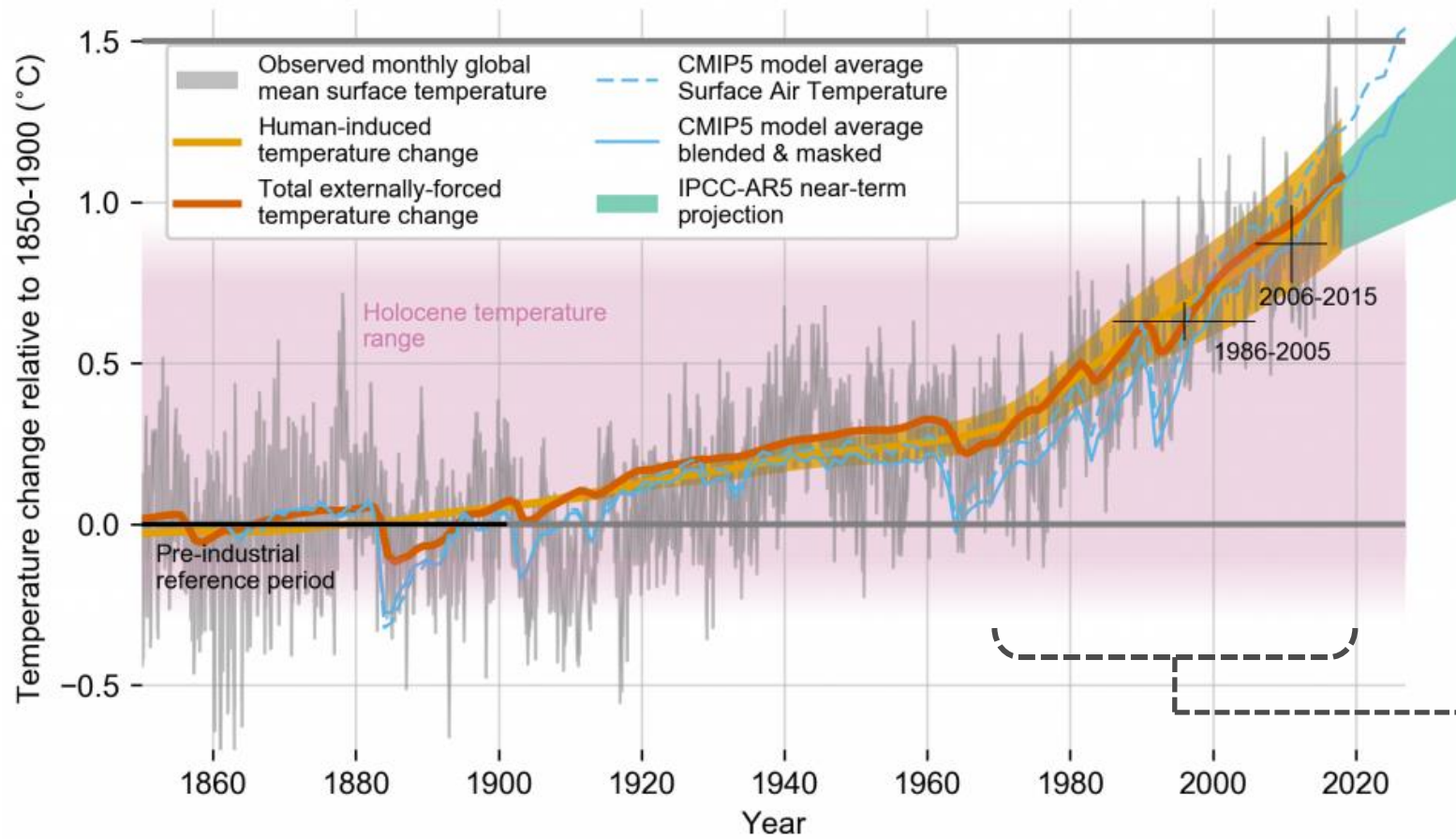


Is recycling the answer?



Conclusion

The Paris Agreement



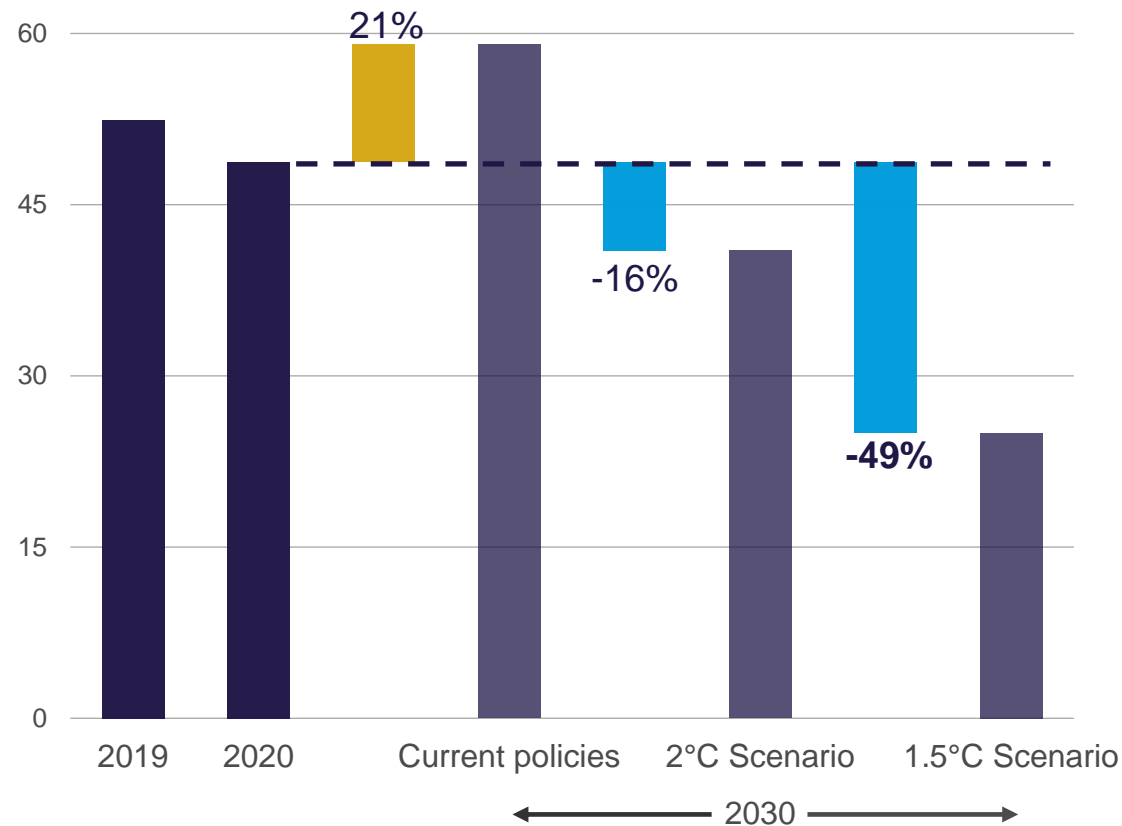
“Limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels”

Already at ~1.1°C in 2020

>70% of increase after 1970

Bridging the gap

Global annual emissions and scenarios in 2030, Gt CO₂e



Quarantine led to a 7% decrease in 2020

- Estimated 49 Gt CO₂e emitted in 2020

Emissions by scenario in 2030

- 2 Degree Scenario – 41 Gt CO₂e
- **1.5 Degree Scenario – 25 Gt CO₂e**

In total, 16% and **49% reduction by 2030**

Annually – 1.7% and **6.5% reduction CAGR**

Regulation, investors and consumers driving change

Government Policies

EU Green Deal and CBAM

UK & EU ETS

US CLEAN Futures Act

Chinese 5-year plan and emissions trading scheme

Canadian national carbon tax

Primary Producers


Hydro
 30% by 2030


RUSAL
 15% by 2025


CHALCO
 www.chalco.com.cn
 40% by 2035

RioTinto
 30% by 2030


ALCOA
 50% by 2030


SOUTH32
 50% by 2030


PRESS METAL
 30% by 2030


vedanta
 20% by 2025


HINDALCO
 25% by 2025

Consumers

BMW



Mercedes Benz



Apple



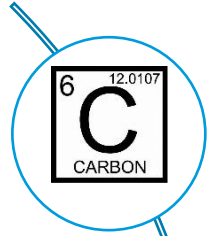
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Nespresso



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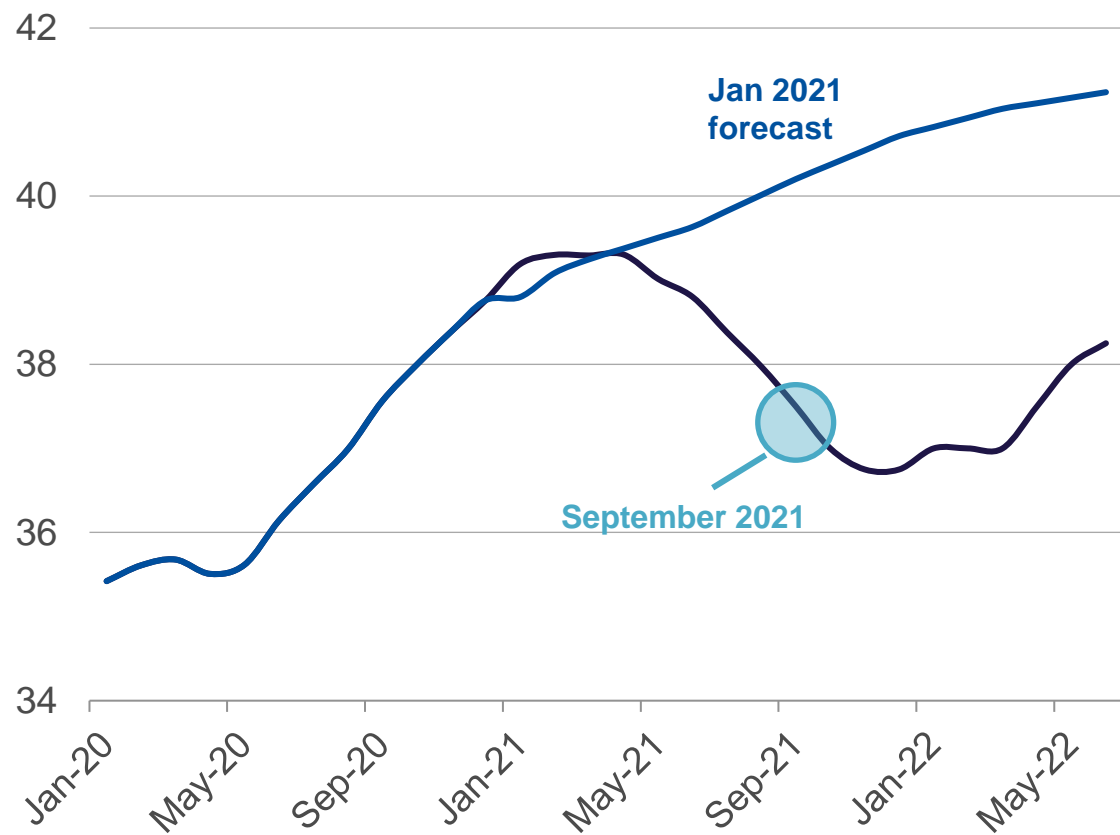
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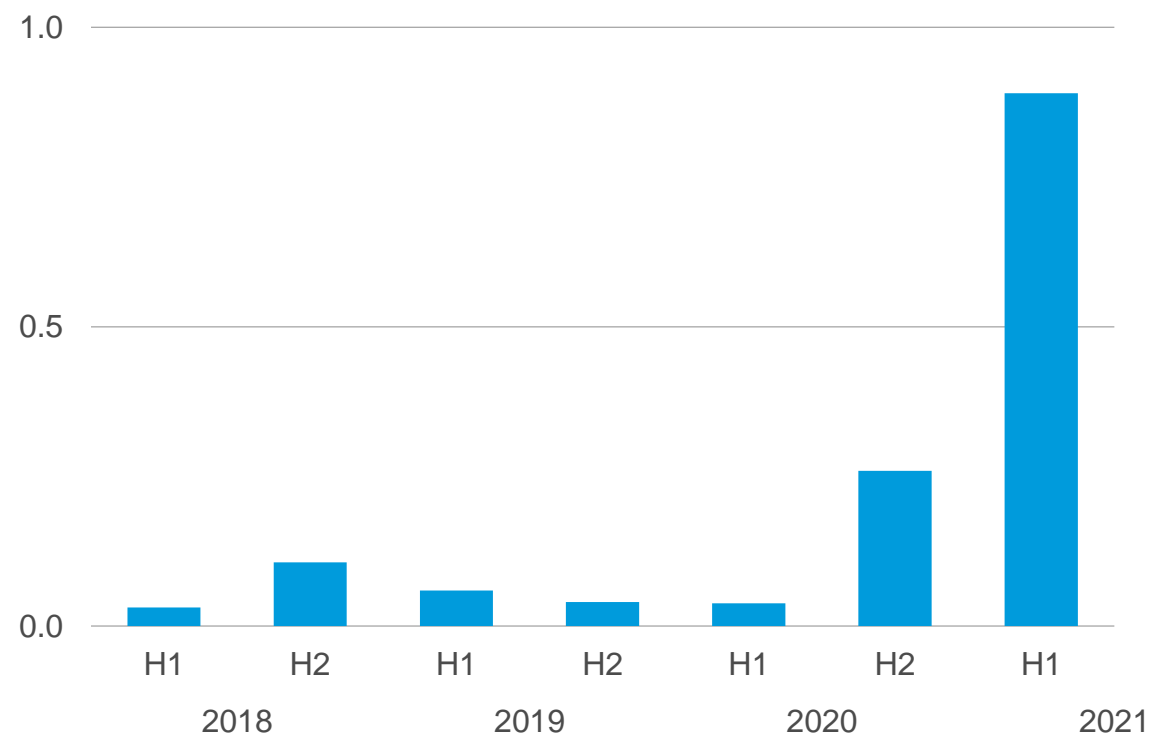
Conclusion

China wants to produce more, but can not

China annualised primary aluminium production, Mt



Chalco aluminium profit before tax, \$ bn



China's NDRC is controlling energy consumption

Dual Control Target Barometer for Energy Consumption Reduction

	Production		Q1 2021			H1 2021	
	'000 t	y/y change	Intensity	Total	Change	Intensity	Total
Yunnan	3,815	68%	●	●	▶	●	●
Qinghai	2,470	10%	●	●	▲	●	●
Guangxi	2,278	5%	●	●	▶	●	●
Ningxia	1,209	0%	●	●	▲	●	●
Fujian	75	0%	●	●	▲	●	●
Xinjiang	6,004	5%	●	●	▲	●	●
Shaanxi	907	0%	●	●	▲	●	●
Sichuan	992	62%	●	●	▲	●	●
Gansu	2,352	3%	●	●	▶	●	●
Henan	1,786	5%	●	●	▶	●	●
Guizhou	1,258	-7%	●	●	▼	●	●
Shanxi	970	30%	●	●	▶	●	●
Liaoning	430	18%	●	●	▶	●	●
Shandong	7,995	1%	●	●	▶	●	●
Inner Mongolia	6,024	8%	●	●	▶	●	●
Chongqing	503	13%	●	●	▶	●	●
Hubei	82	6%	●	●	▼	●	●

Closures to date of operating aluminium smelting capacity

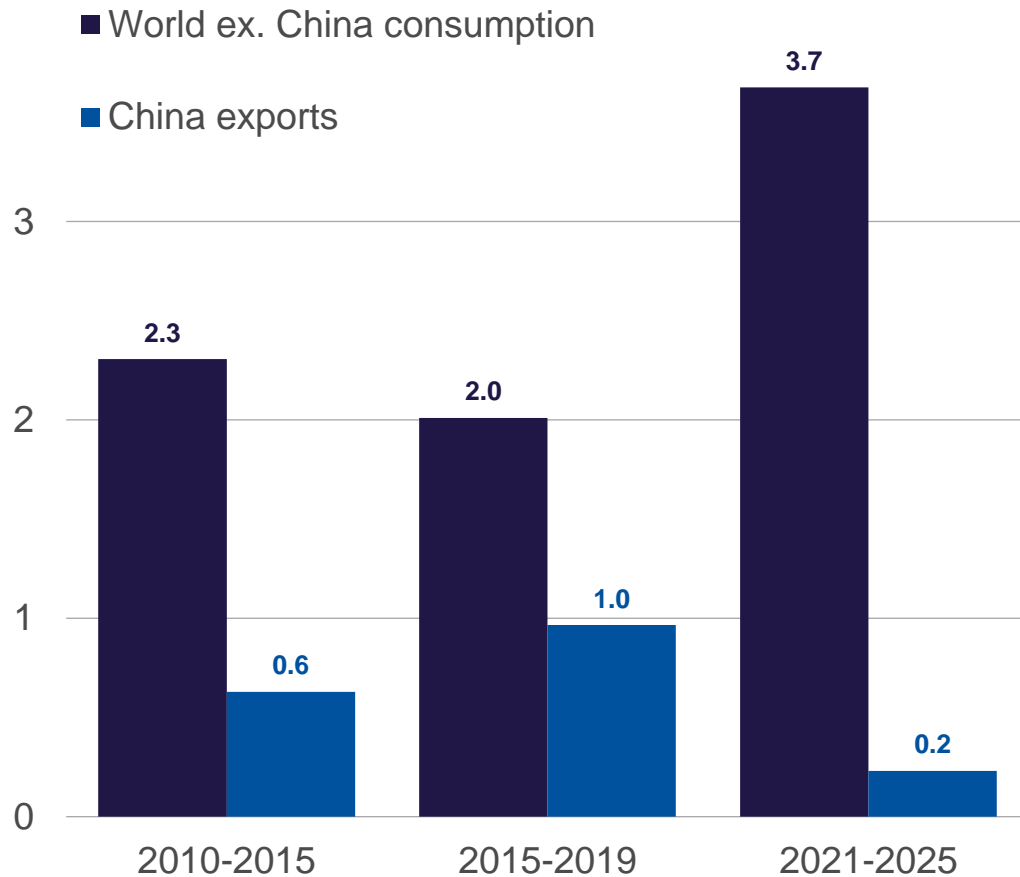
Yunnan 2.1 Mt/y
 Shaanxi 315 kt/y
 Inner Mongolia 300 kt/y
 Guangxi 220 kt/y

At risk

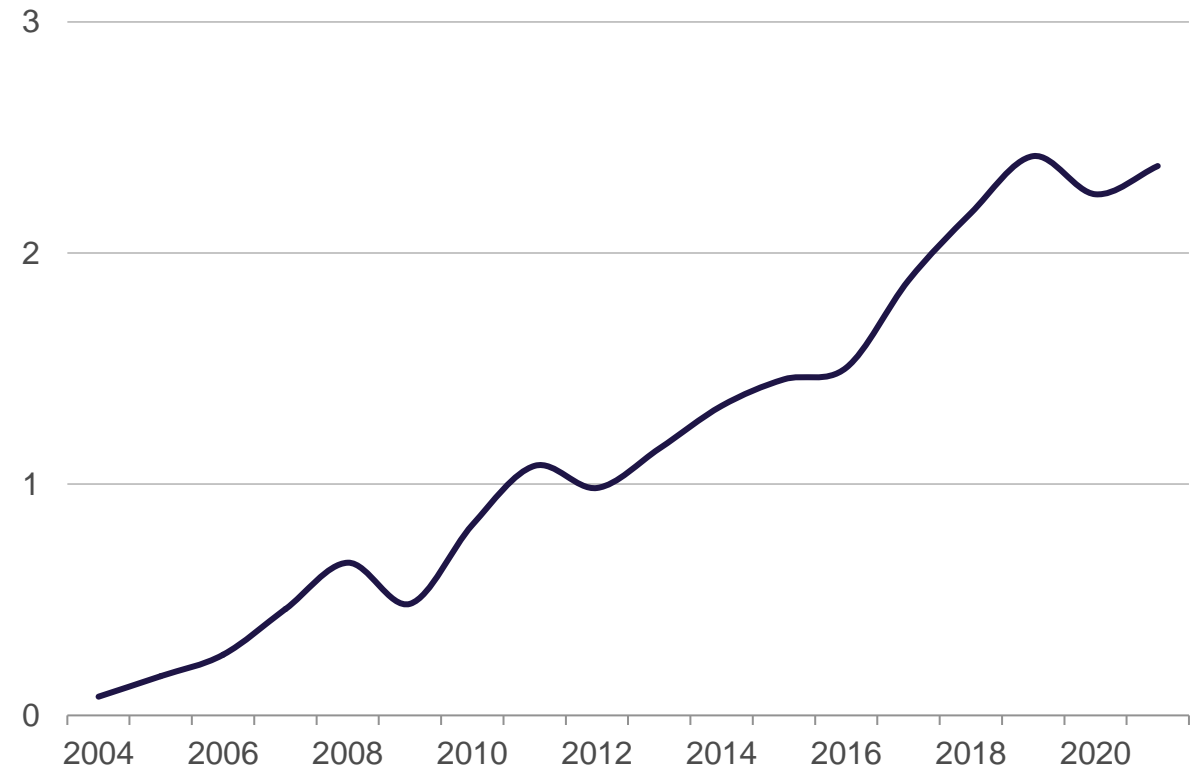
Qinghai, Guizhou, Ningxia, Xinjiang.
 Across these provinces we expect an additional ~1.5Mt/y of curtailments

Chinese exports are flat at a time of robust demand growth ex. China

Growth in consumption and exports, million tonnes

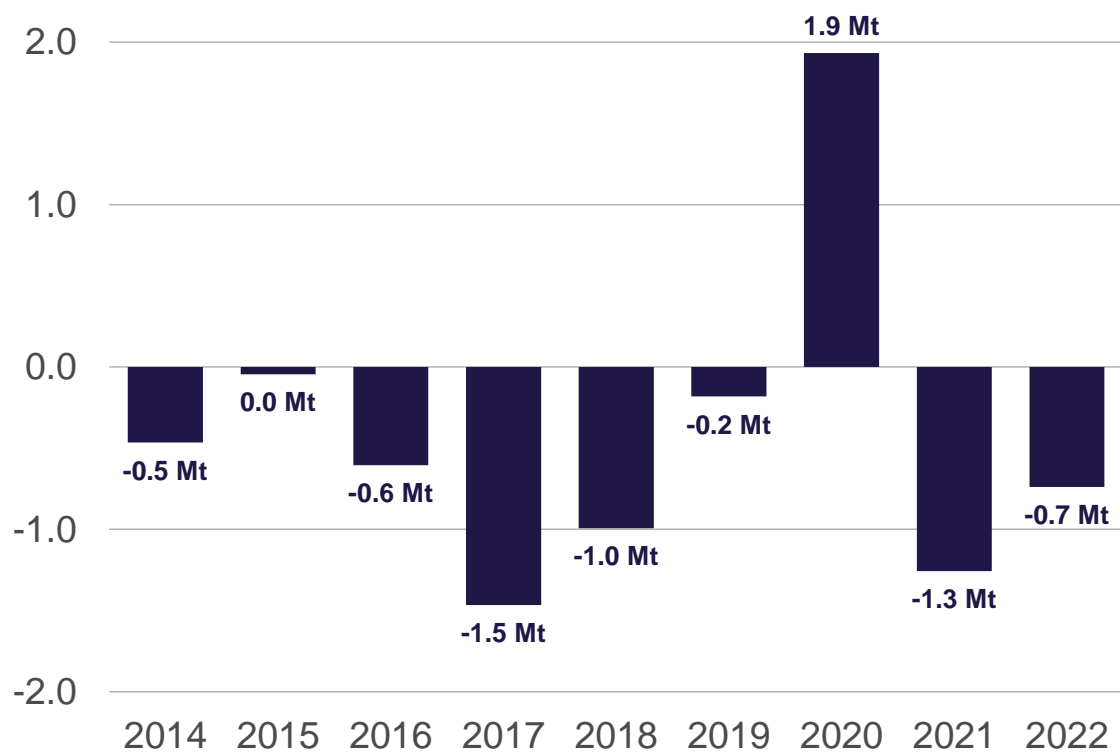


China aluminium rolled products exports, million tonnes

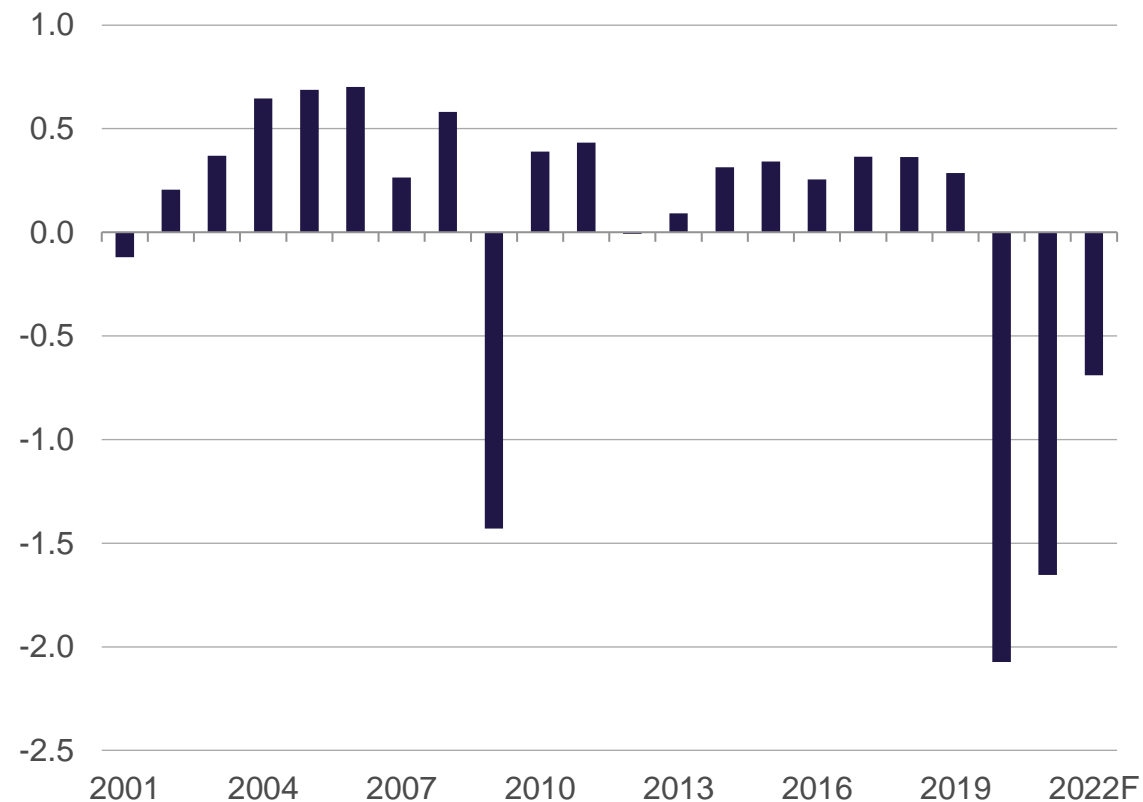


Covid-19 surplus was a blip, but Chinese imports were not

World ex. China aluminium market balance, million tonnes



China aluminium net exports, Million tonnes



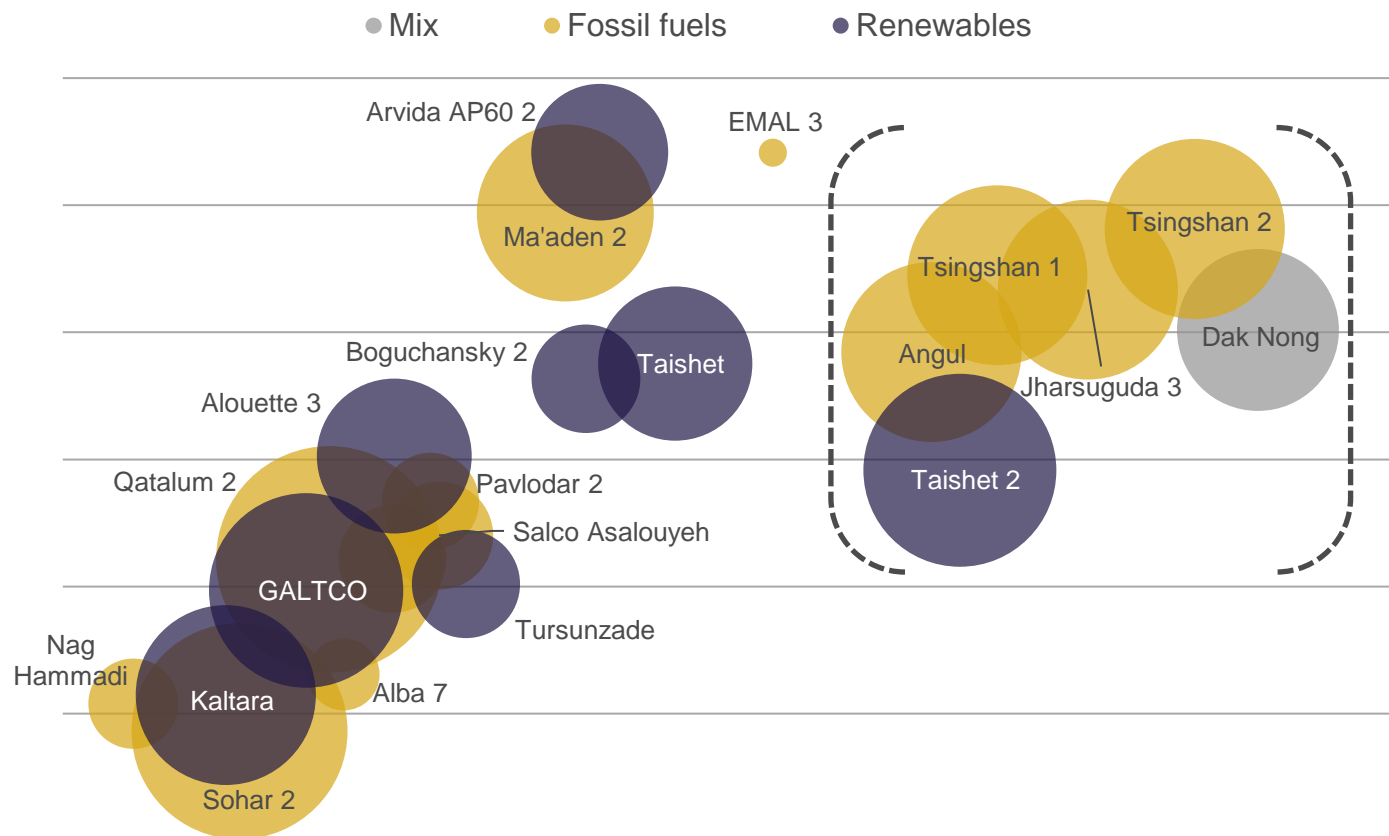
Aluminium prices enter the fifth chapter of the modern era

LME aluminium price, real \$2021



The most promising projects still led by fossil fuels

Project NPV, 2021\$/t (y-axis), vs ungeared IRR, % (x-axis) by energy source



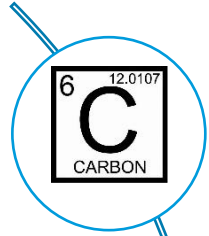
Projects in Asia ex. China have the best financial prospects

Majority fossil-fuel powered

This does not price in:

- Carbon taxation
- Lost value of green premiums
- Additional capex of low carbon technology
- Costs of changing energy sourcing

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What does this mean for primary aluminium?



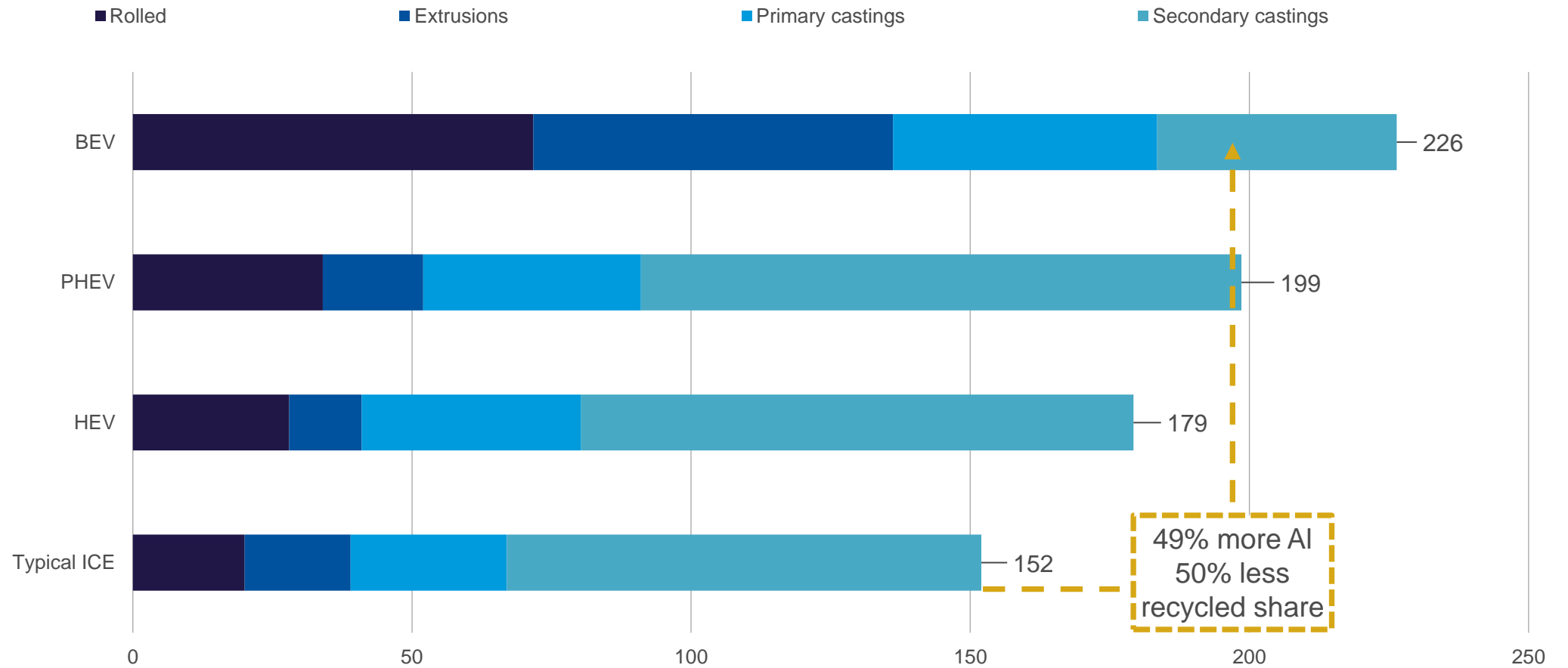
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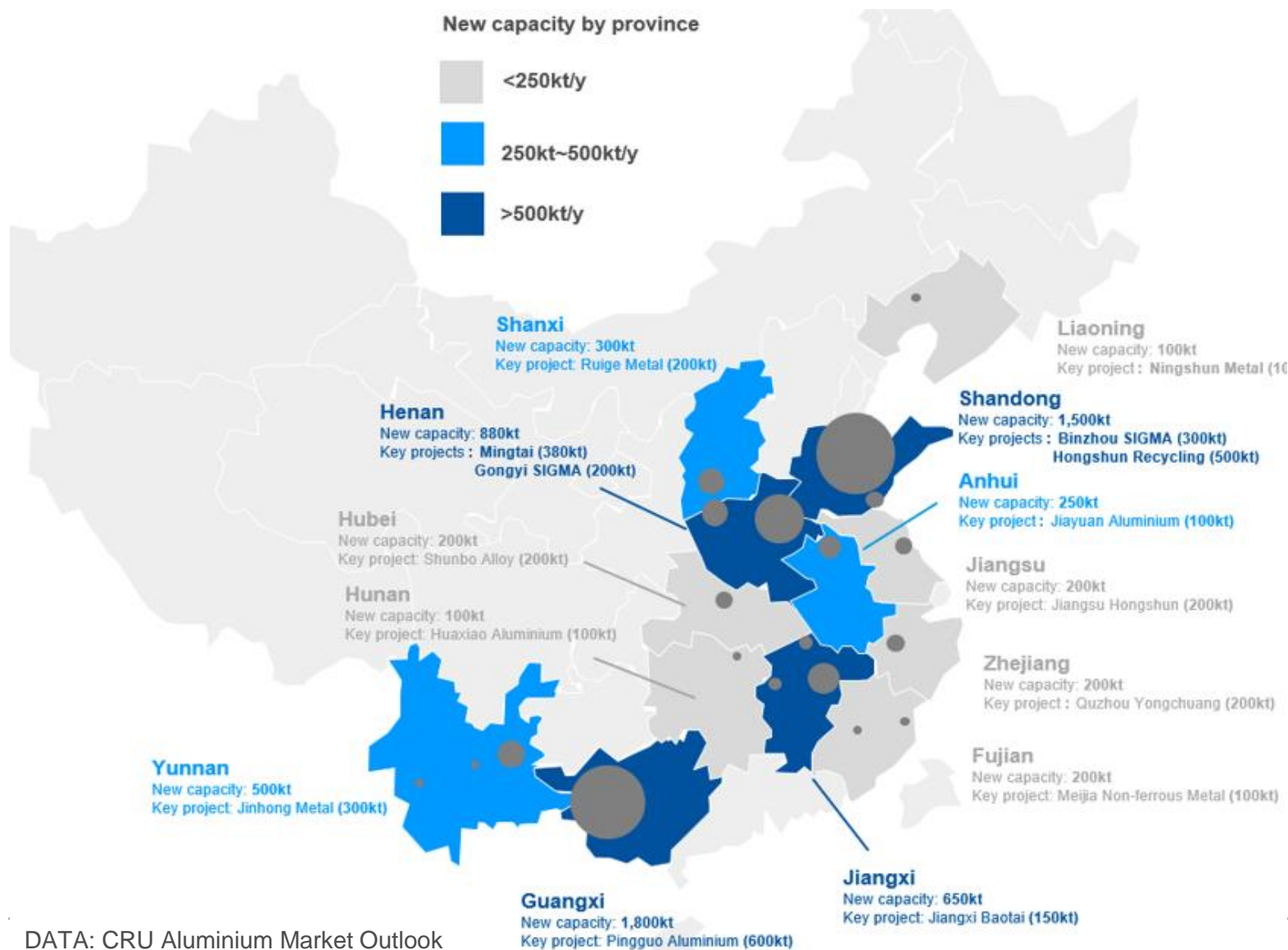
Conclusion

EVs and SFA: demand declines as we see more loss of ICE

Aluminium demand by product form, kg per vehicle



Recycling in China



Recycling in China

China is building recycling plants, over 7Mt/y a 66% increase in capacity

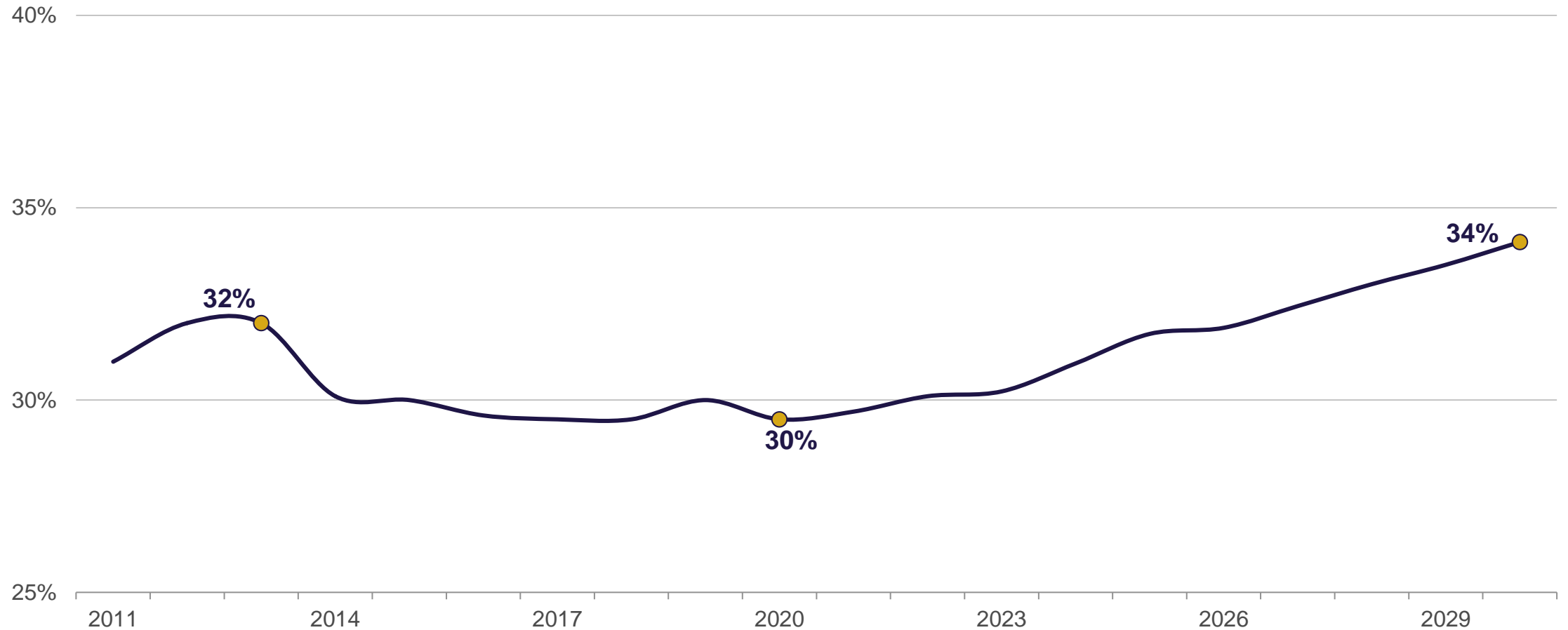
The Chinese government is encouraging the investment in recycling

Post-consumer scrap generation is poised to rise substantially

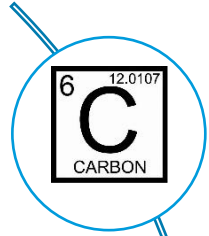
Chinese companies might over-invest and need to increase imports

Recycled aluminium is gaining share from primary aluminium

Recycled aluminium share of total aluminium demand



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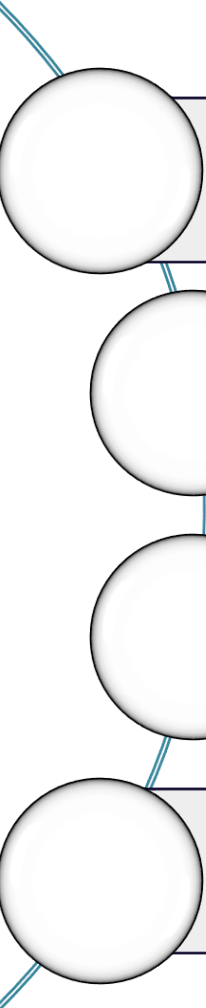


Is recycling the answer?



Conclusion

Key points



Emissions focus is here to stay, and producers face sustained risks

China is now a net importer of primary aluminium

Global market in deficit, won't change soon and will keep prices high

Recycled metal will take share from primary aluminium but it is not easy!



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