PROJECT BLUE

INTERNATIONAL COPPER STUDY GROUP

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Secondary copper industries

World ex-China

Jonathan Barnes
Principal Analyst, Copper demand and scrap
jonathan.barnes@projectblue.com

Loyce Mpangala
Senior Analyst, Copper supply, molybdenum & rhenium
loyce.mpangala@projectblue.com

Agenda – Secondary materials will be a more important part of the copper market equation

1. The economic mandate for renewable raw materials (scrap).
2. Secondary refined production from 2010 to 2025
3. Projected secondary output and the project pipeline
4. Trade policy risks
5. Conclusions

Photo Source: Shutterstock

The economic mandate for renewable raw materials (scrap)

- Premium grade recycled copper retains ~95% of primary metal value.
- Copper & copper alloys are infinitely recyclable with no loss in quality or performance.
- Recycled copper saves up to 90% energy, cuts CO_2 emissions by ~65%.
- Consumer trend: growing demand for higher recycled content and lower carbon footprint.
- Green premiums: some firms secure higher prices for sustainable products (offering differentiated branding).

Photo Source: Shutterstock

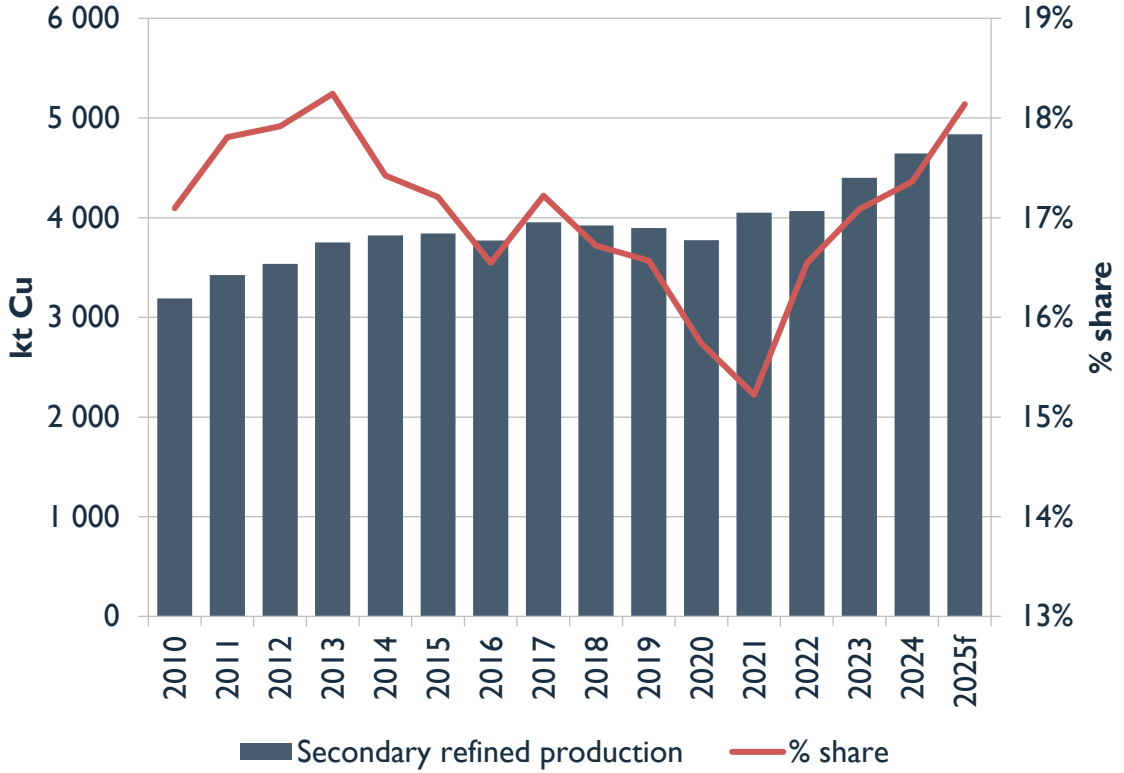
Emerging themes and trends in renewable copper raw materials...

- The language is changing – not 'waste' or 'scrap' but 'renewable raw materials'.
- Copper's recognition as a critical material in the US and EU creates risk.
- Securing control of scrap and e-scrap supply chain is now a strategic goal.
- *Fabricator Push* - Cheaper, high-quality scrap is supplied in greater quantity.
- *Consumer Pull* - End users request semis with a higher % recycled content.
- *Legislative Pull* - Mandatory recycled content laws would be a game changer.
- Unlocking the '*Green Premium*' for wholly and partially recycled copper.
- Recycling is an essential step towards Net Zero in the Energy Transition.

Photo Source: Glencore

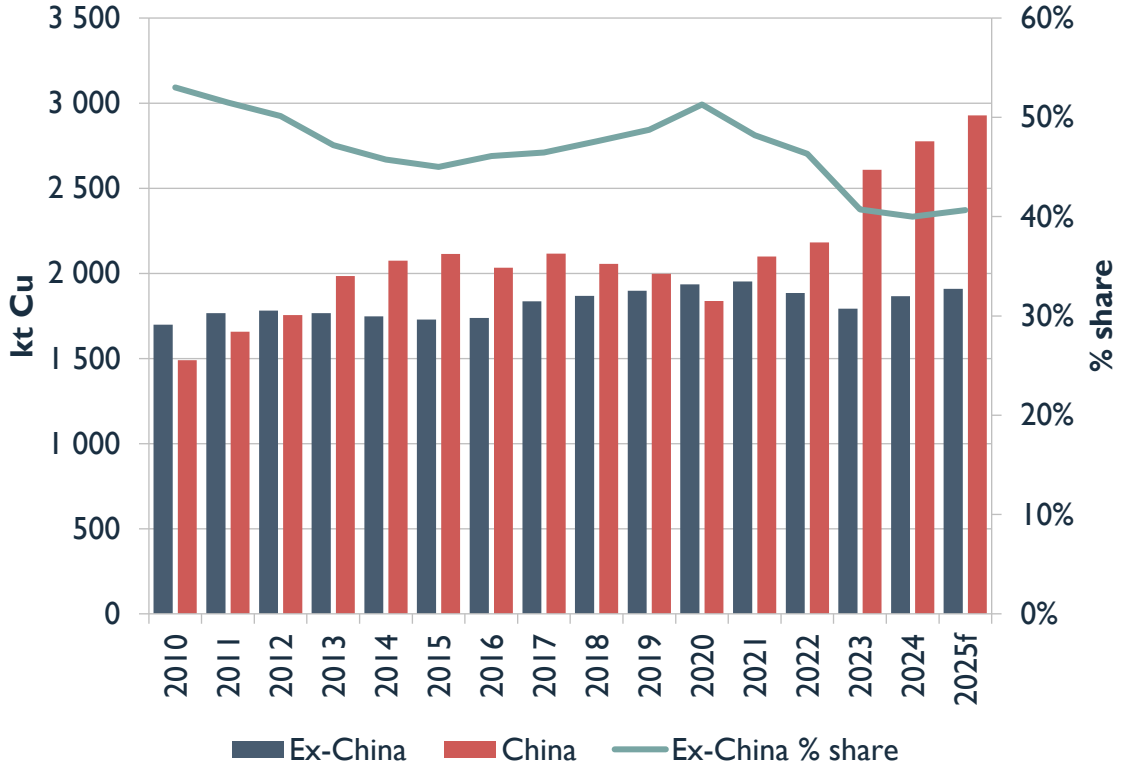
Secondary refined production from 2010 to 2025f

Global secondary refined production (kt Cu, % share)



- Global secondary refined production has grown at a CAGR of 2.8%, from 3.2Mt in 2010 to 4.8Mt in 2025, accounting for 18.1% of total refined output.

World (ex-China) vs China secondary refined production (kt Cu)

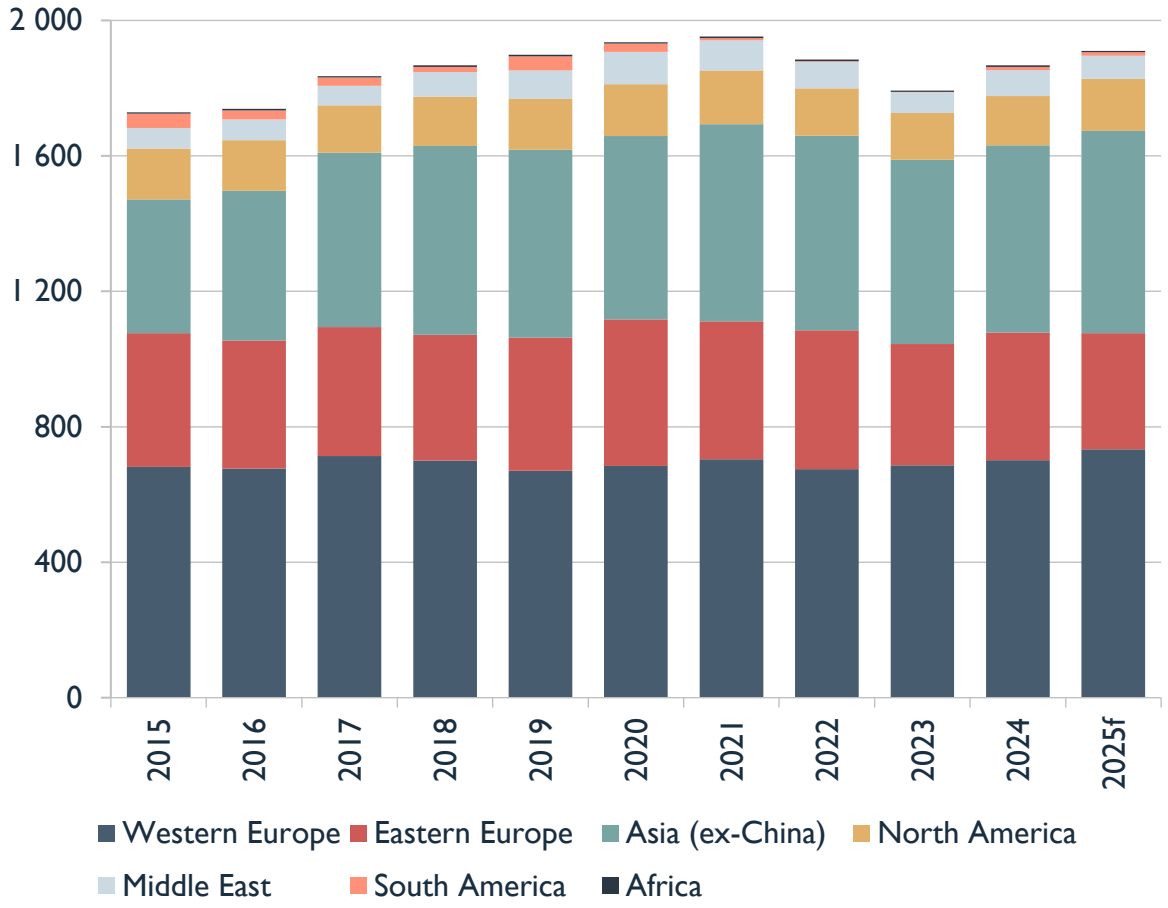


- Asia led growth, with China at approximately 60% of global output. Europe & North America constrained. World (ex-China) grew slowly, just 0.8% CAGR from 1.7Mt in 2010 to 1.9Mt in 2025, now accounting for about 40% of global secondary refined output.

Source: ICSG, Project Blue

World ex-China secondary refined production by region

World (ex-China) secondary refined production by region (kt Cu)

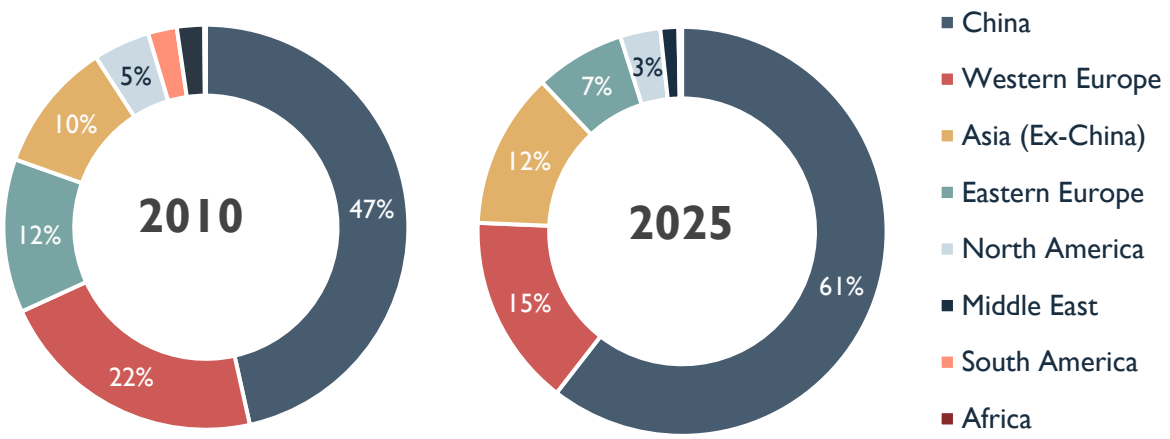


Source: ICSG, Project Blue

- **Europe's** output has remained relatively stable, averaging 1.1Mt over the years. However, its global market share has decreased from 34.1% in 2010 to 22.3% in 2025, due to stronger growth in other regions.
- In **Western Europe**, global market share has fallen from 21.8% (694kt) in 2010 to 15.1% (733kt) in 2025. **Eastern Europe** has also seen a decline, from 12.3% (393kt) in 2010 to 7.1% (344kt) in 2025. **Germany** is the largest producer, with **Belgium**, **Austria**, **Sweden**, **Poland**, and **Russia** maintaining strong refining capacity over the years.
- **Asia (ex-China)** output rose from 334kt in 2010 (10.5% of global) to 597kt in 2025 (12.3%). Within Asia ex-China, Japan accounts for 66% and South Korea 29%.
- **North America**'s output has remained around 145kt, accounting for 4.5% of global output in 2010 and 3.2% in 2025. The USA remains the largest producer in the region, averaging 100kt annually.
- While smaller in scale, other regions such as **South America (Brazil)**, the **Middle East (Iran)**, and **Africa (Egypt)** also contribute to the global secondary copper supply.

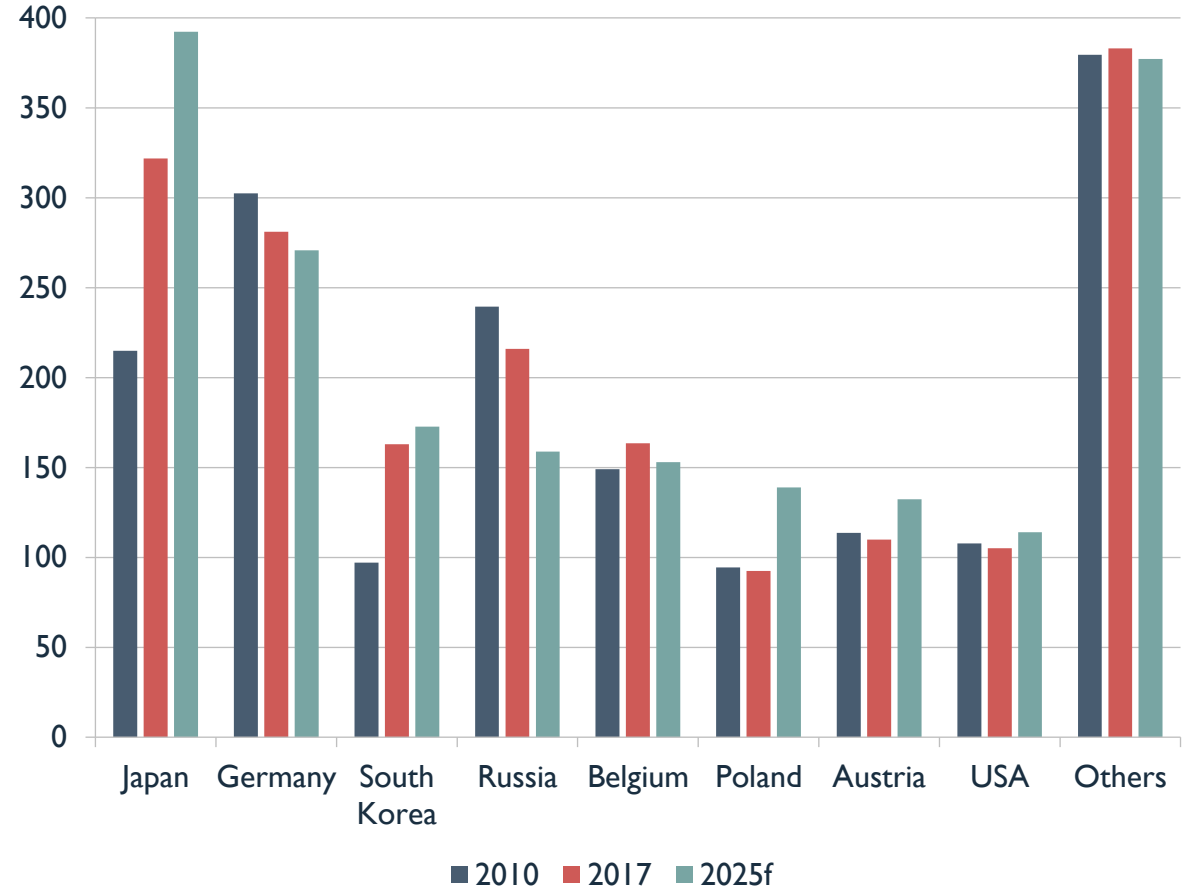
Key country-level secondary refined production (2010 vs 2017 vs 2025f)

Regional distribution (2010 vs 2025)



- **Japan** is the largest producer in World (ex-China), with 392kt in 2025, equal to 8.1% of global secondary refined output.
- **Germany** follows with 271kt (5.6%), then South Korea at 173kt (3.6%).
- Other key producers are Russia (3.3%), Belgium (3.1%), Poland (2.9%), Austria (2.7%), and the USA (2.4%).

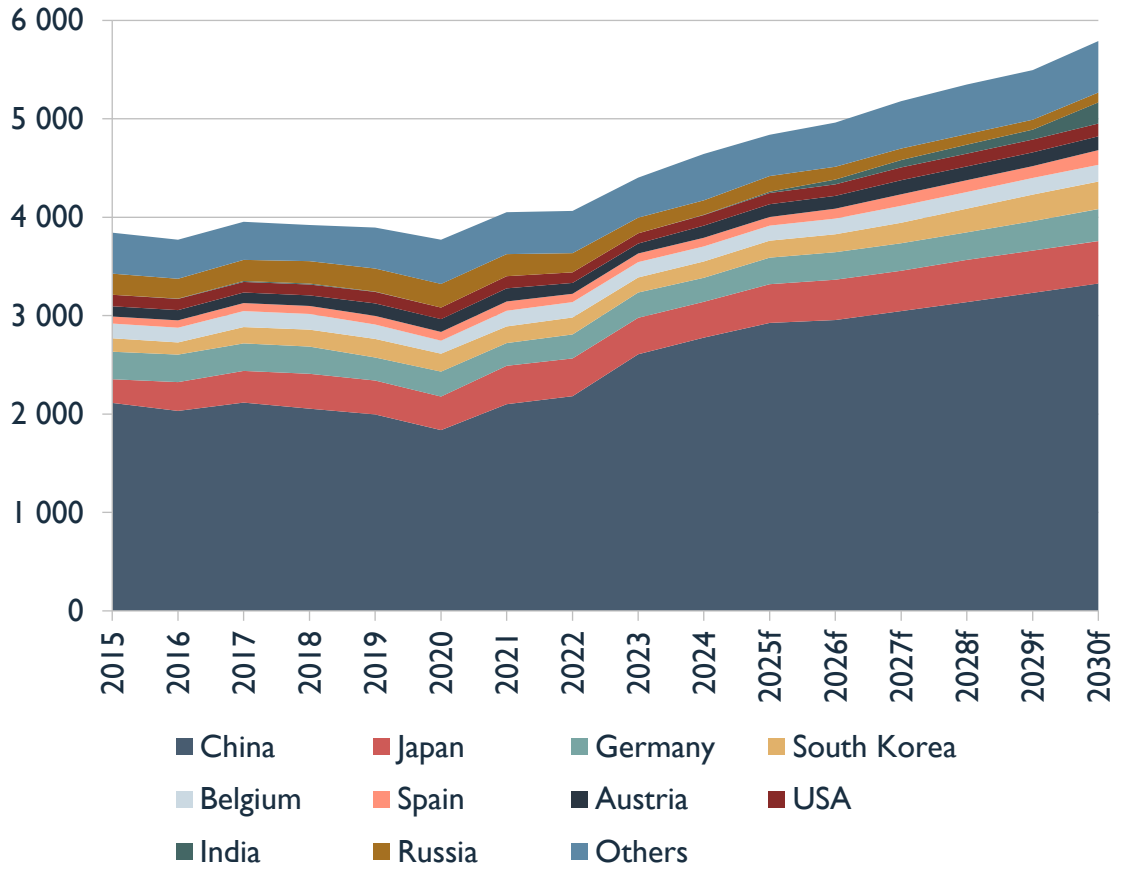
Key country-level secondary refined production (kt Cu)



Source: ICSG, Project Blue

Projected secondary production forecast

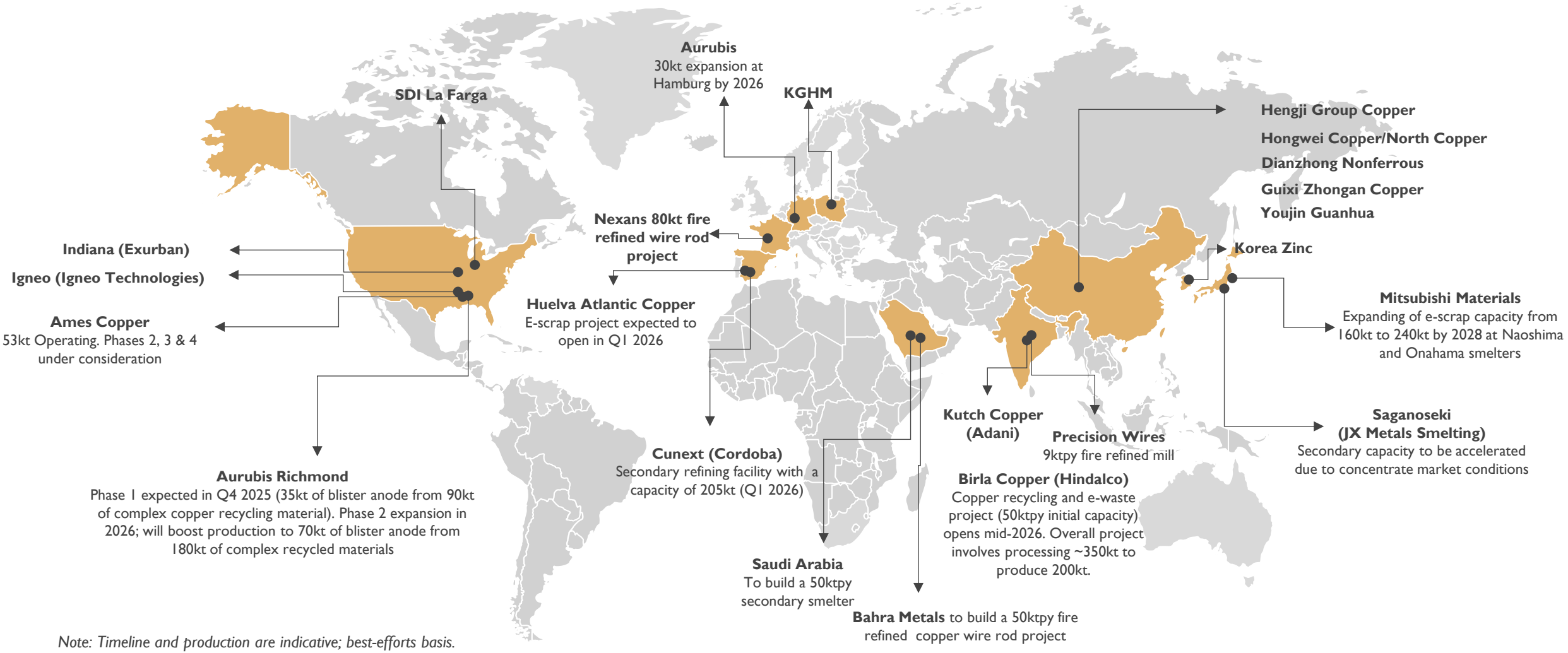
Global secondary refined production (2015-2030f kt Cu)



Source: Project Blue, ICSG

- Over the next five years, secondary copper production capacity is expected to expand significantly, driven by rising demand for recycled copper, policy incentives promoting circular economies, and advancements in refining technology.
- Several new secondary smelters and refineries are scheduled to come online, particularly in China, Japan, South Korea, India, USA, Spain, Poland, France, and Saudi Arabia, where governments are actively supporting sustainable resource use and emissions reductions.
- Global secondary refined copper production is forecast to reach 4.8Mt in 2025, a 4.2% increase from 2024 levels. Between 2025 and 2030, planned and under-construction projects are expected to drive a 3.7% CAGR in global secondary copper capacity, increasing from 4.8Mt in 2025 to 5.8Mt by 2030.
- China will continue to drive much of this growth, capitalising on its extensive, though still relatively inefficient, recycling network, steady scrap imports, and strong policy support for a circular economy.

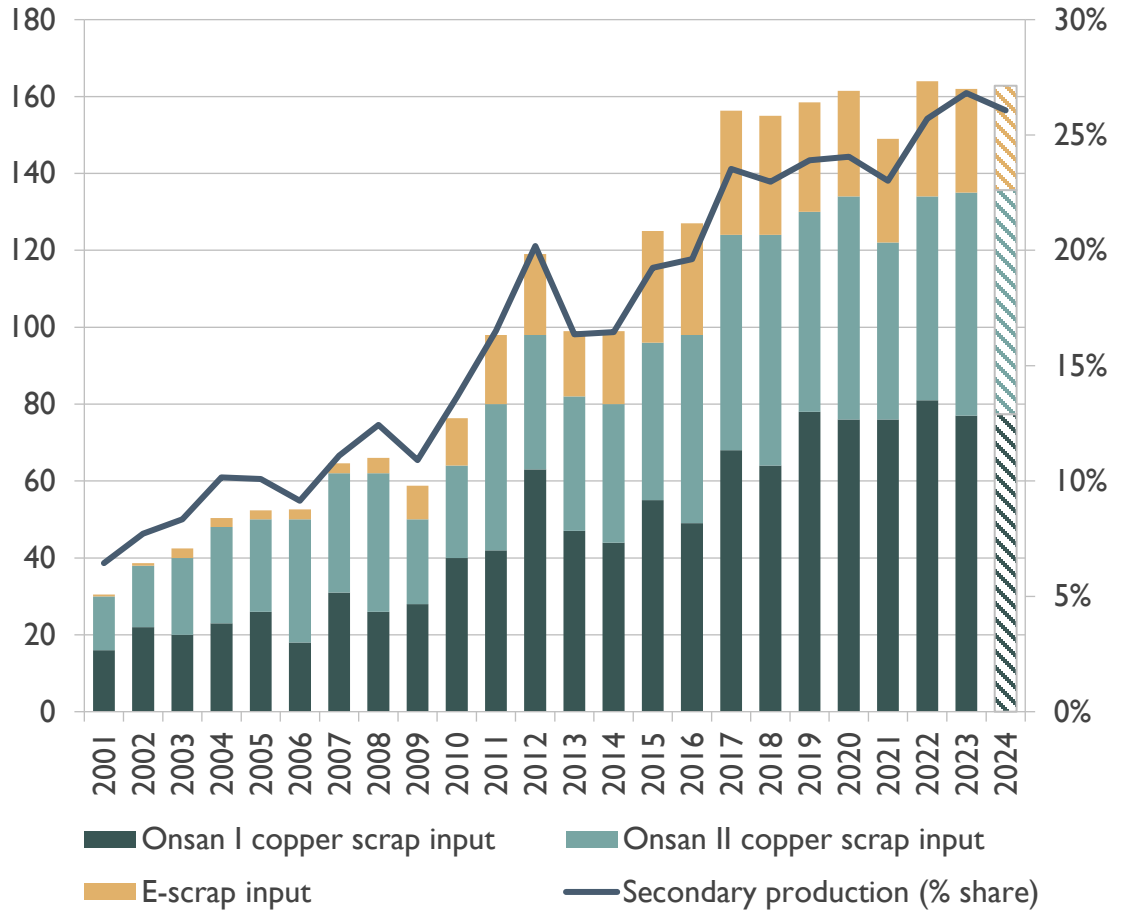
Spotlight on the secondary projects pipeline



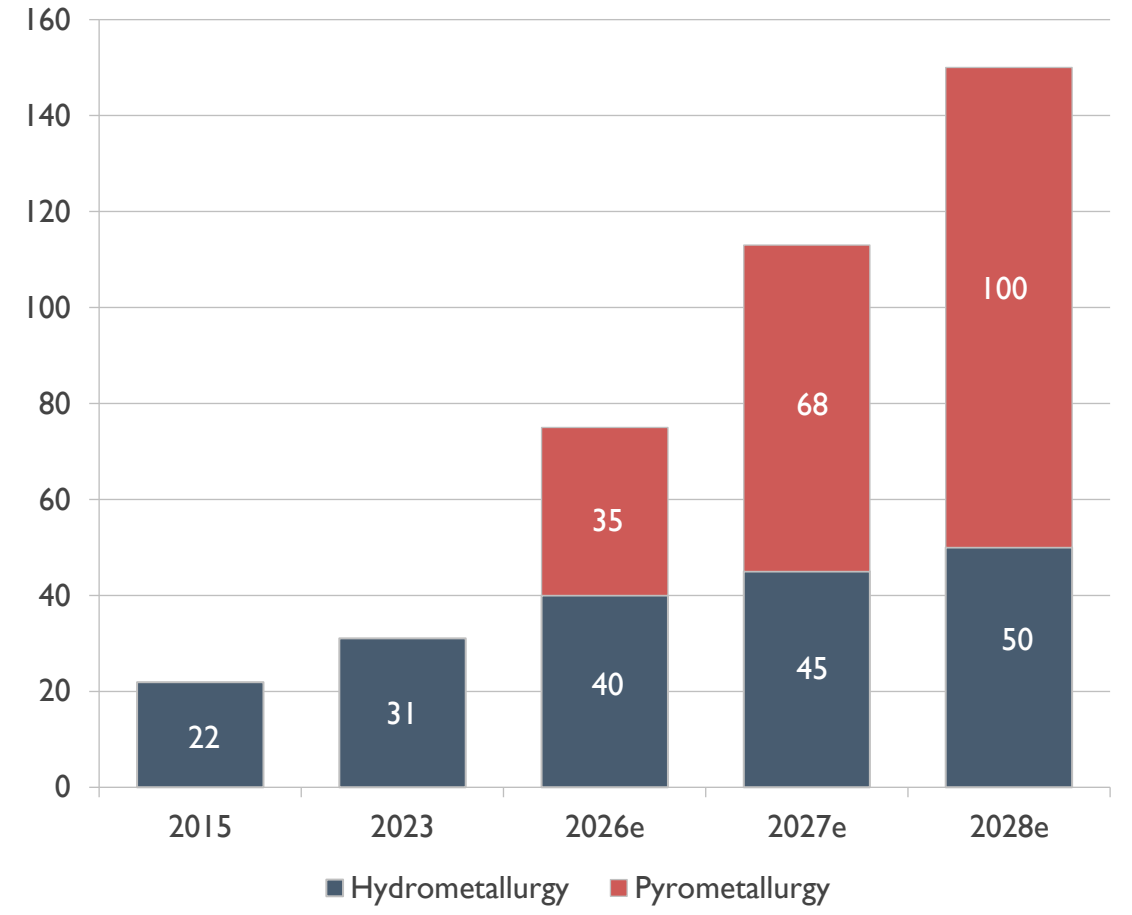
Note: Timeline and production are indicative; best-efforts basis.

Two South Korean smelters embracing renewable copper raw materials

LS Metals & Materials scrap inputs (kt, % share)



Korea Zinc forecast copper secondary capacity (kt)



Source: LS Metals & Materials, Korea Zinc

Policies & regulations impacting secondary copper supply chains

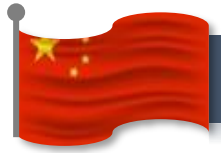
EU Waste Shipments → Prevent export of EU waste challenges to third (non-OECD) countries; Strengthen enforcement against illegal waste shipments within and outside the EU. Improve traceability of shipments and promote recycling and reuse.

Basel Convention → Regulates trade in end-of-life materials; 2022 amendment broadened e-scrap coverage, effective since January 1st, 2025.

An Agenda for Change → The British Metals Recycling Association (BMRA) calling on government to recognise the benefits of free and fair trade for recycled materials.

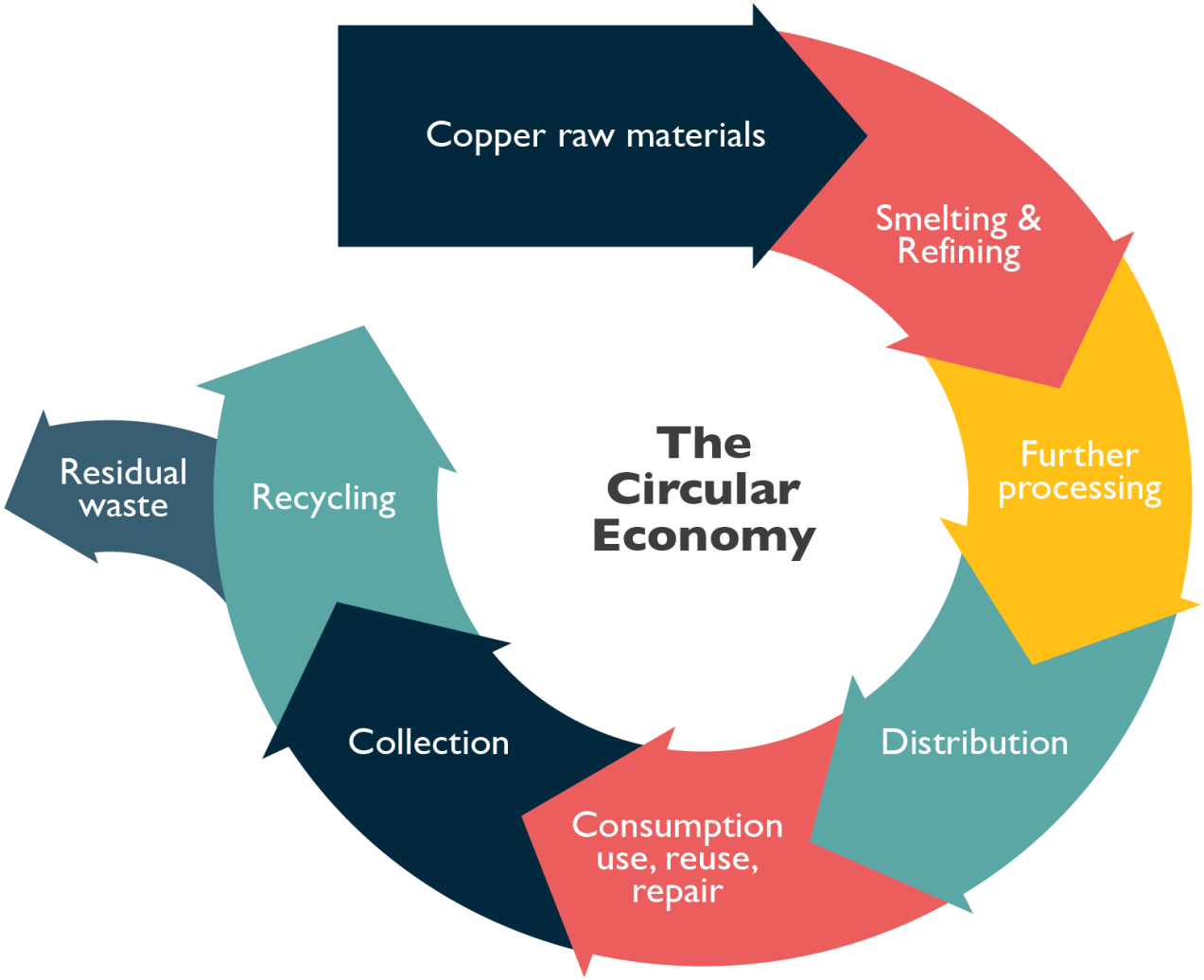
Defense Production Act → Requiring that 25% of high-quality scrap and other copper input materials produced in the USA be sold domestically by 2027, increasing to 40% by 2029.

Japan E-scrap Policy → Strict regulations on copper scrap trade, focusing on controlling the export of 'mixed met scrap' (metal scrap mixed with electrical and electronic equipment (EEE)) which contains hazardous materials.



China Import Policy → Inspection effort aimed at reducing the volume of contaminated recyclables and waste being sent to the country along with scrap metal

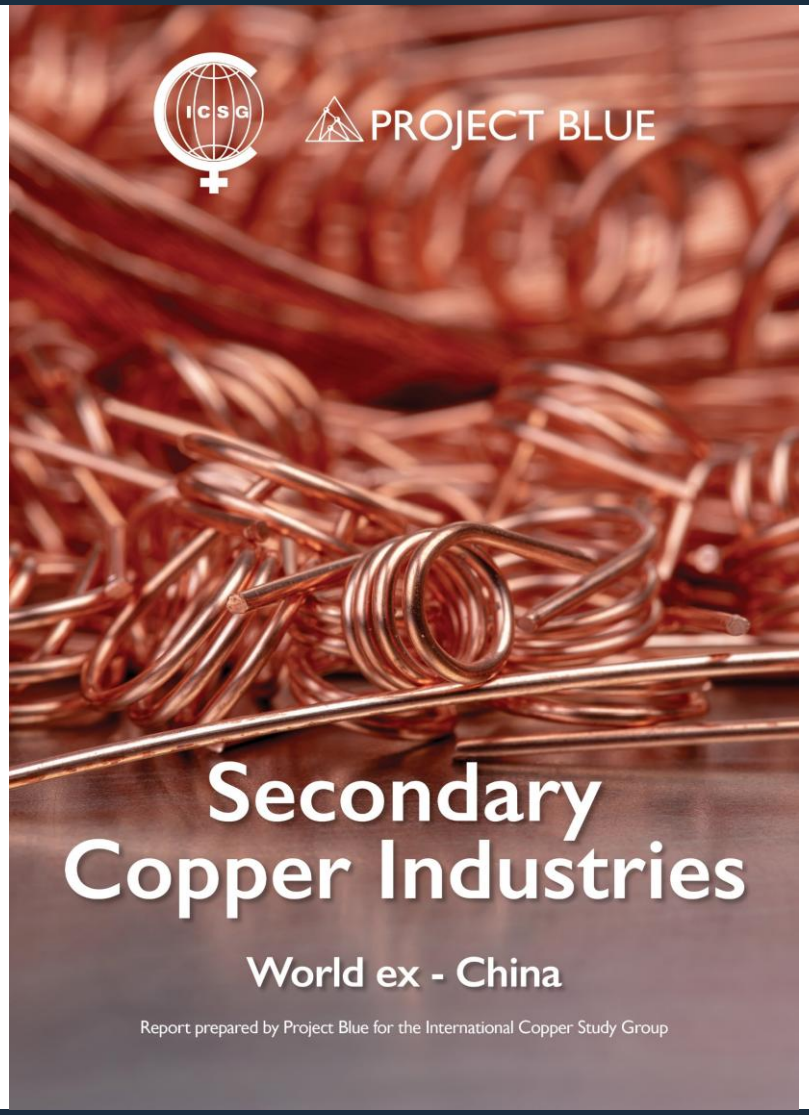
Closing the copper loop - A critical material in the circular economy



Conclusions

- The economic and environmental mandate of recycled copper materials is undeniable.
- The copper industry is awakening to the long-term potential of increased secondary output.
- This is particularly relevant in the context of the present challenging outlook for primary copper.
- There are numerous new secondary projects underway or planned across different geographies.
- They may be designed to treat either simple or complex secondary material streams.
- They are faster, less expensive and lower risk to construct than brownfield or greenfield mine projects.
- Well intentioned, but poorly implemented, policies pose risks to the free and fair global trade in recycled materials.
- Secondary materials will certainly play a more important role in the future copper market equation.

Thank you for listening!



HQ: 71-75 Shelton Street
Covent Garden
London
WC2H9JQ
+44 (0) 203 883 4945

info@projectblue.com

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www.projectblue.com