ASX Release

03 June 2025

MTM Achieves 98% Recovery of High-Grade (3.1%) Antimony from U.S. E-Waste

Demonstrates Onshore Urban Mining Potential Aligned with U.S. Critical Metals Strategy

- **3.13% Antimony (Sb) recovered from U.S.-sourced e-waste feedstock using MTM's proprietary FJH technology.**
- **98% conversion of antimony to water-soluble chloride in a single-step, acid-free process.**
- **Feedstock sourced from U.S. e-waste including telecom equipment and servers — underscoring the value of high-grade urban mining streams.**
- **Recovered grade of 3.13% Sb exceeds global primary antimony mine averages (0.1–1.0%).**
- **Antimony is a critical metal used in munitions, semiconductors, batteries, and flame retardants.**
- **The U.S. has no significant domestic Sb production, relying heavily on Chinese imports.**
- **Results demonstrate the viability of onshore metal recovery from E-Waste, supporting U.S. strategic supply chains. Recent discussions in Washington with U.S. government and Department of Defense (DoD) representatives further underscored the national interest in securing domestic antimony supply.**

MTM Critical Metals Limited ("MTM" or the "Company") (ASX: MTM; OTCQB: MTMCF) has achieved 98% recovery of antimony from U.S. electronic waste, extracting 3.13% Sb from printed circuit board feedstock using its proprietary Flash Joule Heating (FJH) technology. This grade far exceeds that of typical mined ore, where even the largest primary deposits (e.g. China's Xikuangshan) average just 0.5–0.7% Sb. The tested feedstock — the same urban waste material from which MTM previously reported ultra-high-grade gold, silver, and copper recoveries[1] — highlights the untapped value of complex e-waste streams.

The tested material — sourced from U.S.-origin printed circuit boards — had undergone upstream thermal processing to remove plastics and volatiles, yielding a concentrated, metal-rich carbonaceous residue. This "urban ore" contained 3.13% antimony, a grade more than three times higher than some of the world's largest primary deposits, including China's Xikuangshan, and significantly above the global mined ore range of 0.1–1.0% Sb (USGS, 2024).

These results demonstrate the technical and strategic value of MTM's FJH process in recovering critical metals from e-waste, directly supporting U.S. efforts to re-establish domestic refining capacity. Recent discussions in Washington with U.S. government and Department of Defense (DoD) and Department of Energy (DoE) officials reinforced the national priority of onshoring antimony supply, further underscoring the relevance of MTM's technology and approach**. Importantly, MTM has already secured over 1,100 tonnes per year of e-waste feedstock under long-term agreements with U.S. suppliers[1], separate from the material tested here — providing a strong foundation for commercial deployment.**

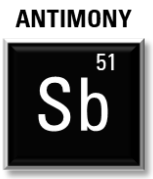
MTM Managing Director & CEO, Michael Walshe, commented: *"This result demonstrates the strong technical and commercial potential of our FJH process for recovering strategic metals from e-waste. Achieving 98% recovery of antimony at over 3% grade, from domestic urban feedstock, is particularly significant given the U.S. currently has no meaningful domestic Sb production. With antimony designated as a critical metal by both the DoD and DoE, these outcomes reinforce MTM's ability to contribute to onshore supply solutions for high-priority metals. Combined with our recently secured, pre-permitted demonstration site in Texas, we are well positioned to scale operations and advance commercial deployment.*

"In parallel, the Company is engaging with U.S. government agencies, including the DoD and DoE, regarding potential funding to support domestic critical metal recovery. While early-stage and non-binding, these discussions reflect strong interest in scalable U.S.-based refining technologies. The strategic role of antimony in defence, particularly in armour-piercing alloys and flame-retardant systems, was a consistent theme during recent meetings in Washington".

[1] Ref. ASX: MTM release: 10/04/2024, '*Ultra-High-Grade Gold (over 550 g/t) and Other High-Value Metals Recovered from E-Scrap, and Supply Agreement Secured*'.

SOURCE OF ANTIMONY IN FEEDSTOCK

The elevated Sb content reflects the nature of legacy and industrial-grade electronics. Antimony is:



- **Commonly alloyed with tin or lead in solder compositions** (e.g. Sn-Sb or Pb-Sn-Sb), used extensively in older servers, military hardware, and telecom equipment.
- **Used as a flame retardant** (typically antimony trioxide, Sb_2O_3) in PCB laminates and electronic housings.

These components tend to remain in the solid residue during thermal pre-processing, resulting in significant Sb enrichment in the final feedstock processed by MTM.

GLOBAL CONTEXT: TYPICAL ANTIMONY ORE GRADES

For comparison, most primary antimony mines globally produce ore with grades ranging between 0.1% and 1.0% Sb, with only a few high-grade exceptions. The table below highlights typical grades from key deposits and historic producers, reinforcing the significance of MTM's 3.13% Sb recovery from U.S. e-waste — a level that exceeds or rivals even the world's best-known antimony mines. This underscores the commercial and strategic relevance of recovering critical metals from high-grade urban waste streams.

Table 1: Representative Sb Ore Grades from Global Deposits vs MTM E-Waste Feedstock

Mine/Location	Country	Typical Sb Grade (% by weight)	Notes
Xikuangshan	China	0.5–0.7%	World's largest known Sb deposit; Hunan Province
Murchison Range	South Africa	~1.0%	One of the largest historic Sb producers outside China
Tulabolo (formerly Takatok)	Indonesia	~1.2%	Sb mined historically; limited recent production
Tajikistan (various deposits)	Tajikistan	0.3–1.0%	Soviet-era grades; now mostly artisanal/minor
Hillgrove Au-Sb Mine	Australia	1.2%	Sb Ore Reserve
AVE. GLOBAL ORE GRADES	-	**0.1–1.0%**	**MOST COMMERCIAL MINES FALL WITHIN THIS RANGE**

Source: Filella et. al 2002; Hillgrove Resources Ltd 2025; USGS, 2024.

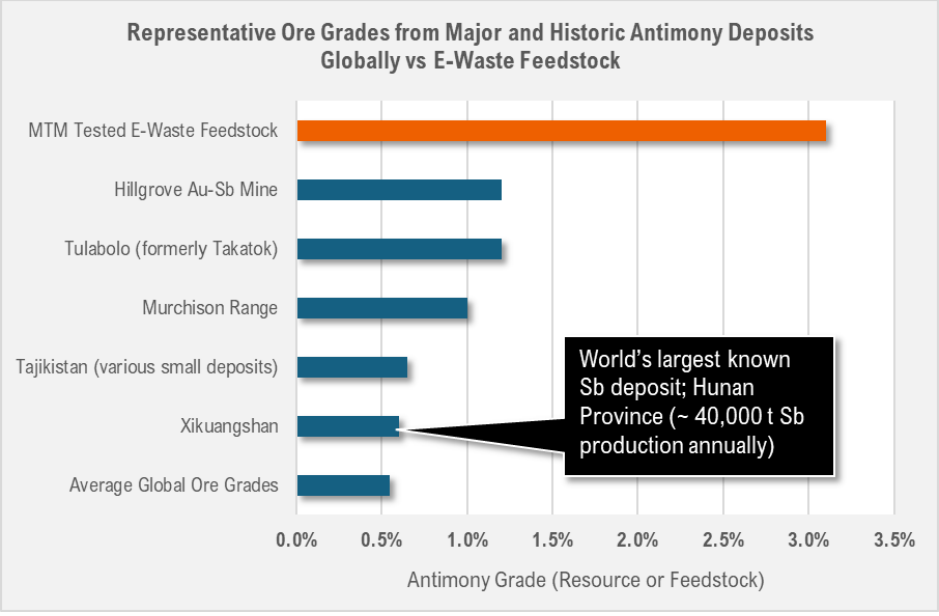


Figure 1: Chart comparing grade of E-Waste Material Tested vs Major Global Sb Mines. Source: USGS, 2024; Filella et. al 2002.

E-WASTE METAL GRADE AND RECOVERY PERFORMANCE

The tested feedstock, derived from U.S.-sourced printed circuit boards (PCBs), and contained significantly high metal content, in both precious metals like gold (up to 551 g/t)[1] and antimony (up to 3.1%). Note: This tested material was provided by a confidential client. Key results include:

Table 2: Summary of Testwork Results

Element	Grade in Feedstock (g/t Sb)	Recovery of Sb to Chloride (%)
Antimony (Sb)	31,340 g/t	98%

Figure 2: Photo of (L) original E-Waste PCB waste & (R) metal rich char (E-Waste with plastics removed by separate process)

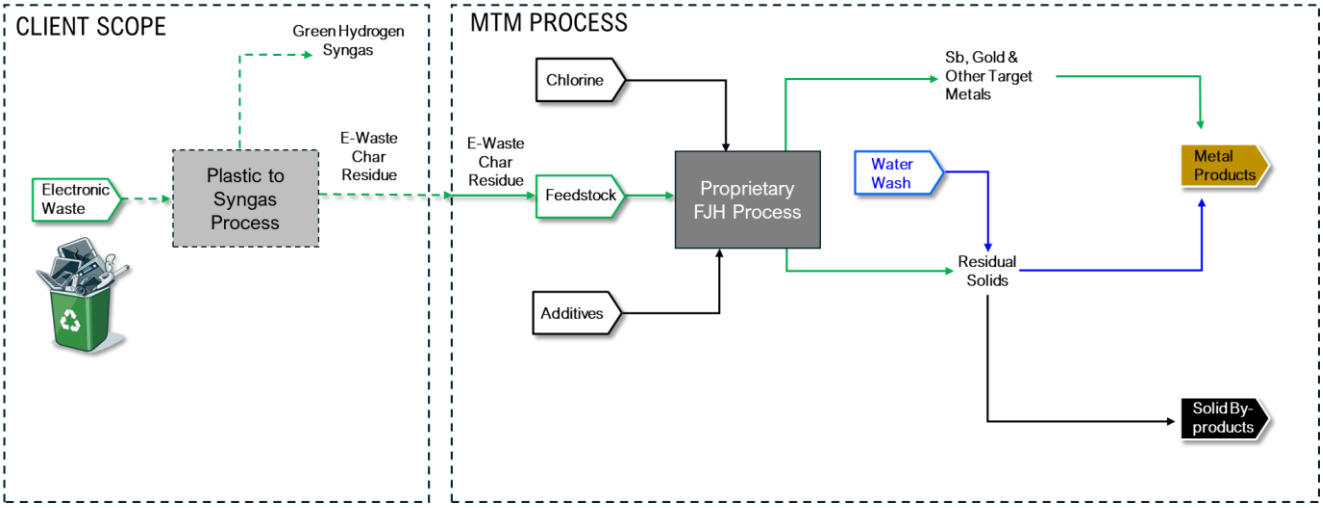


Figure 3: E-Waste Process Flow Diagram for Metal Recovery

The e-waste material tested in this study consisted of a metal-rich char, produced via a separate upstream process that removed the plastic fraction by converting it into synthesis gas (syngas). This left behind a concentrated, carbonaceous residue enriched in metals, which was then processed by MTM using its FJH technology. MTM previously reported very high recovery of gold, copper and other metals from this same feedstock[2], with similarly exceptional recovery results—demonstrating the flexibility and robustness of the process across different metals.

[2] Ref. ASX: MTM release: 10/04/2024, '*Ultra-High-Grade Gold (over 550 g/t) and Other High-Value Metals Recovered from E-Scrap, and Supply Agreement Secured*'.

SUPPLY-SIDE DISRUPTION & PRICE CONTEXT

China's tightening control over strategic metal exports — including antimony — has triggered significant supply-side uncertainty in global markets. China accounts for nearly **50% of global antimony mine production** and dominates the refining sector, with estimates suggesting it controls over **70% of global antimony refining capacity** (Fastmarkets 2025; USGS 2024).

Recent enforcement actions have severely restricted outbound flows, with materials such as antimony metal, trioxide, and even previously unregulated forms now subject to customs scrutiny. Traders report widespread delays, suspended shipments, and rising risk aversion among Chinese exporters. These disruptions are occurring against a backdrop of heightened geopolitical tension and increasing Western efforts to secure non-Chinese sources of critical metals.

As a result, benchmark antimony prices have surged — with Rotterdam-delivered antimony now trading above **US$60,000/t**, and antimony trioxide reaching over **US$38,000/t CIF Europe**, more than triple 2023 levels.

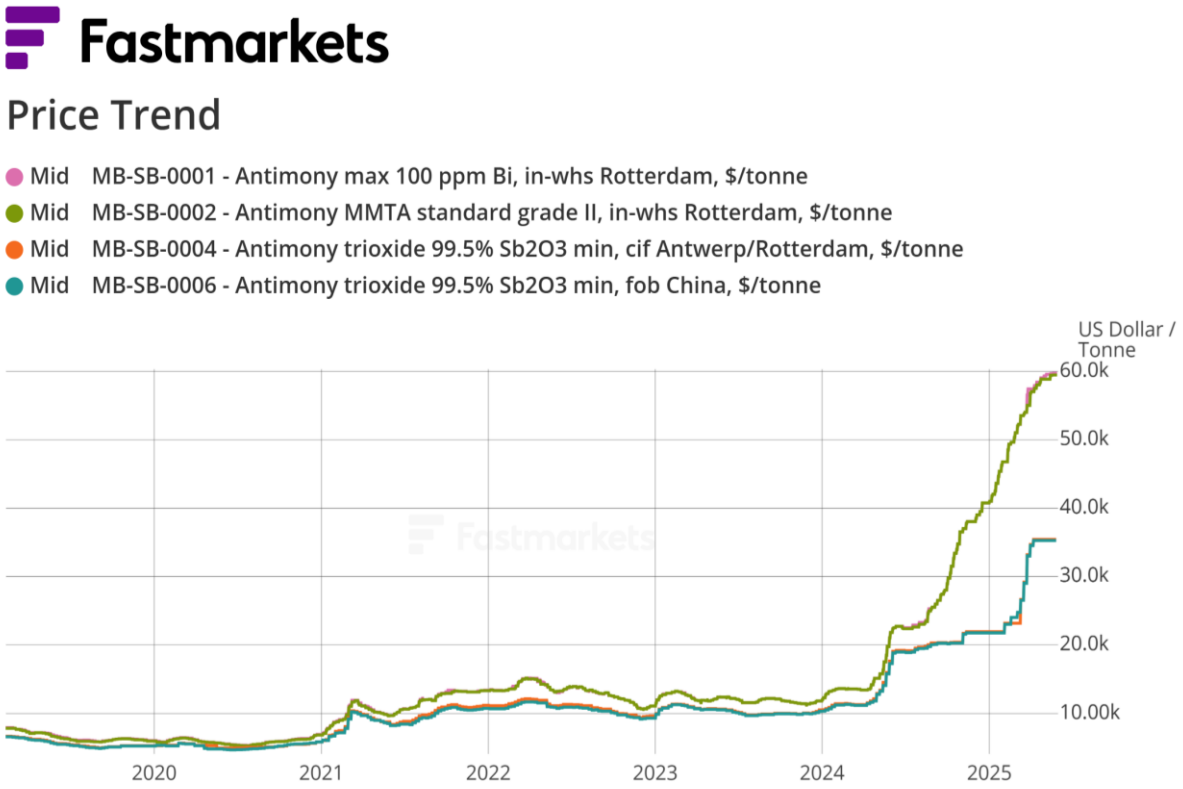


Figure 4: Fastmarkets-tracked price surge in antimony metal and trioxide products (2020–2025) amid tightening Chinese export controls (Fastmarkets 2025)

STRATEGIC MARKET OPPORTUNITY

The global E-Waste market is expanding rapidly, projected to grow from ~$58 billion in 2022 to $245 billion by 2032, with a compound annual growth rate (CAGR) of 16% (Allied Market Research, 2023). Key global regions include:

- United States: **Generated ~7 million tonnes of E-Waste in 2021**, with recycling rates below 25% (Scoop Market, 2023). This represents a significant untapped opportunity for MTM's technology.
- Japan: A leader in E-Waste recycling, with stringent regulations ensuring high recovery rates (Baldé et al., 2024).
- Taiwan: A semiconductor hub with mandated recycling targets of 75% for manufacturers (Baldé et al., 2024).
- Europe: The largest E-Waste recycling market, driven by the EU's Critical Raw Materials Act (2023) and WEEE Directive, targeting 4 kg per capita recycling annually (Statista, 2023).

SUMMARY OF METHOD AND RESULTS

Initial tests demonstrated significant valuable metal chloride recovery from printed circuit board (PCB) e-waste utilising FJH carbochlorination and water washing across a wide range of valuable metals.

- **Single Flash Test**: The initial, unoptimized test was conducted using samples of processed e-waste as described earlier. The feedstock was flashed in a chlorinated atmosphere to facilitate the formation and separation of metal chlorides and the vapourised products were collected via condensation into a mixed chloride solution. The Company is evaluating a range of downstream separation and refining options to convert the recovered chlorides into separated products, as required to meet potential commercial or end-use specifications.
- **Water Washing**: After flashing, water washes were conducted to remove metal chlorides from the residual solids. TotalQuant Inductively Coupled Plasma Mass Spectrometry (ICP-MS)[3] was used to quantify the metals in both the solid byproducts and the water wash solutions.
- The metal grades in this feedstock are exceptional relative to traditional mining operations, and the recovery rates achieved are equally superior to those typically reported for legacy e-waste processing methods (Cui & Zhang, 2008; Tesfaye et al., 2017), as outlined in the Company's 10 April 2024 e-waste recovery announcement[1].

Table3: Summary of Testwork Results (inclusive of previously reported results[1] from the same PCB-derived feedstock)

Element	Feedstock Grade	Recovery to Chloride (%)	Comment
Antimony (Sb)	31,340 g/t	98%	Discussed herein
Gold (Au)	551 g/t	100%	See ASX: MTM release: 10/04/2024
Silver (Ag)	2,804 g/t	97%	See ASX: MTM release: 10/04/2024
Copper (Cu)	41.60%	91%	See ASX: MTM release: 10/04/2024
Tin (Sn)	13.20%	97%	See ASX: MTM release: 10/04/2024
Aluminium (Al)	5.20%	91%	See ASX: MTM release: 10/04/2024
Zinc (Zn)	1.30%	99%	See ASX: MTM release: 10/04/2024
Nickel (Ni)	1.40%	81%	See ASX: MTM release: 10/04/2024
Titanium (Ti)	0.20%	100%	See ASX: MTM release: 10/04/2024

NEXT STEPS

- Conduct broader sampling across multiple e-waste batches to verify repeatability of Sb enrichment
- Evaluate downstream refining pathways to produce further refined Sb products
- Advance engagement with U.S. government agencies, industrial end-users, and critical metals stakeholders focused on securing domestic sources of strategic metals like antimony.

[3] TotalQuant refers to a mode in ICP-MS where all measurable elements are detected and quantified in a single run without prior specific selection of elements. This is particularly useful for complex samples where a comprehensive elemental profile is required. It is considered qualitative (or semi-quantitative) (±25% accuracy) because, in the TotalQuant mode, it provides a broad overview of the elements present in a sample without the rigorous calibration that would be needed for fully quantitative results & does not account for possible elemental interferences between various metals.

This announcement has been authorised for release by the Board of Directors.

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PREVIOUS DISCLOSURE

The information in this announcement is based on the following MTM Critical Metals Limited ASX announcements, which are all available from the MTM Critical Metals Limited website www.mtmcriticalmetals.com.au and the ASX website www.asx.com.au.

Previous **e-waste-related announcements** highlighted

Date	Description
10/04/2025	Ultra-High-Grade Gold (over 550 g/t) and Other High-Value Metals Recovered from E-Scrap, and Supply Agreement Secured
08/10/2024	Significant Multi-Metal Recovery from Electronic Waste Including Palladium & Tin
25/09/2024	High Silver & Copper Recovery from e-Waste using FJH
12/09/2024	High Gold Recovery from E-Waste using FJH Technology

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ABOUT MTM CRITICAL METALS LIMITED

MTM Critical Metals Limited (ABN 27 645 885 463), is an ASX & OTCQB-listed company with management teams in Perth, Western Australia, and Texas, USA, and specialises in advanced metal recovery technologies. MTM's 100%-owned USA subsidiary **Flash Metals USA Inc** is based in Texas, USA. MTM possess exclusive licensing rights to the innovative *Flash Joule Heating technology*, a cutting-edge metal recovery and mineral processing method developed by esteemed researchers at Rice University, USA.

Flash Joule Heating (FJH) is an advanced electrothermal process that enhances metal recovery and mineral processing compared to traditional methods. By rapidly heating materials in a controlled atmosphere, FJH efficiently extracts metals like lithium from spodumene, gallium from scrap, and gold from E-Waste, among others. This technology has the potential to revolutionise metal recovery by reducing energy consumption, reagent use, and waste, offering a more economical and environmentally friendly alternative.

To learn more, visit:

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