

ASX Release

4 August 2026

Metallium Signs First Technology Services Agreement Advancing Processing-as-a-Service Strategy

- **Metallium signs its first commercial monetisation deal for the Flash Joule Heating (FJH) platform:** a 12-month technology services agreement with Environmental Clean Technologies (ASX: ECT) to evaluate FJH — using rapid heating with chlorine — as a faster, more scalable alternative to conventional HF-based processing for producing 'MXenes', using Metallium's Gator Point reactor systems and engineering support.
- **Total 'Phase-1' consideration up to US\$1.4m (~A\$2.0m):** US\$500,000 payable unconditionally on execution, remaining US\$900,000 in four quarterly instalments of US\$225,000 from 1 November 2026, plus **20 million ECT options at A\$0.18/share (12-month expiry)** — the options subject to ECT shareholder approval¹.
- **Represents Metallium's first commercial validation of strategy to monetise expanding FJH intellectual property portfolio through technology services, commercial licensing, royalty streams and strategic partnerships.**
- Provides a framework under which the parties may negotiate in good faith a **potential long-term commercial licence and royalty agreement ('Phase-2')** following successful completion of the R&D programme.
- ECT holds the exclusive licence to commercialise FJH for MXene production, but lack a working reactor platform — rather than build from scratch, **ECT is leveraging Metallium's already-developed, scaled reactor systems and Gator Point Technology Campus to accelerate its MXene programme**
- **Establishes a template for Metallium's "Processing-as-a-Service" model — engineering/licensing revenue alongside its core Build-Own-Operate metals recovery business**
- **MXenes are ultrathin 2D materials prized for conductivity, EMI shielding and energy-storage applications across defence, electronics and batteries**, but commercial production has been constrained by slow, hazardous, hard-to-scale HF-based methods — the gap FJH is being evaluated to address.
- **Metallium retains ownership of its proprietary FJH reactor technology and all future technology improvements.**

Metallium Limited ("Metallium" or the "Company") (ASX: **MTM**; OTCQX: **MTMCF**; OTCQX ADR: **MTLMY**) is pleased to announce that via its wholly owned subsidiary Flash Metals USA, it has entered into a 12-month Research & Development and Engineering Support Services Agreement with [Environmental Clean Technologies Limited](#) (ASX: **ECT**) ("ECT").

This agreement represents the first commercial monetisation of Metallium's proprietary Flash Joule Heating platform and the first commercial implementation of the Company's 'Processing-as-a-Service' strategy. The agreement demonstrates how Metallium's proprietary FJH platform can be commercialised through engineering services, technology access, licensing and, where appropriate, royalty arrangements alongside its core 'Build, Own & Operate' processing operations.

Under the agreement, ECT will undertake an agreed research and development programme at Metallium's Gator Point Technology Campus in Chambers County, Texas, focused on applying FJH technology to the production of MXenes and related advanced materials. Metallium will provide engineering support services, reactor access and technical expertise throughout the programme.

Managing Director & CEO Michael Walshe commented: "This agreement represents an important milestone in Metallium's commercial evolution. While our primary focus remains building a leading U.S. critical metals processing business, we have always believed Flash Joule Heating is a platform technology capable of creating value well beyond metals extraction. This agreement represents the first commercial monetisation of that broader platform strategy and validates the significant investment we have made in developing our proprietary reactor technology, engineering capability and Gator Point Technology Campus."

¹ Based on total contracted cash payments of US\$1.4 million over the initial 12-month term (approximately A\$2.0 million based on prevailing exchange rates), excluding the value of the ECT options. The agreement remains subject to its terms and conditions, including shareholder approvals required by ECT for the issue of options and certain fee arrangements.

"MXenes represent one of the most exciting emerging classes of advanced materials, with potential applications across defence, advanced electronics, next-generation batteries, sensors and water treatment. Their combination of high value and constrained global supply has created a compelling commercial opportunity, however conventional manufacturing methods remain slow, hazardous and difficult to scale. We believe our proprietary Flash Joule Heating platform has the potential to deliver a step-change in manufacturing efficiency, scalability and production economics, and we look forward to working closely with ECT as it progresses the commercial development of this exciting technology."

"Importantly, this agreement demonstrates how Metallium can commercialise its proprietary Flash Joule Heating platform while retaining ownership of the underlying intellectual property. We believe it establishes a repeatable commercial pathway through engineering services, technology access, commercial licensing and, where appropriate, long-term royalty arrangements, complementing our core Build, Own & Operate strategy. The inclusion of an equity component also aligns Metallium's interests with ECT's long-term success and provides potential additional upside as ECT advances the commercial development of its MXene programme."

ECT Chairman Faldi Ismail commented: *"Metallium's significant investment in developing a proprietary, scalable Flash Joule Heating reactor platform, together with its engineering expertise and established Gator Point Technology Campus, provides ECT with an accelerated and capital-efficient pathway to advance our MXene programme. We believe Flash Joule Heating has the potential to overcome the manufacturing constraints that have historically limited commercial MXene production, and we look forward to working closely with Metallium as we progress the technology toward commercialisation."*

STRATEGIC SIGNIFICANCE

This agreement demonstrates several important milestones for Metallium:

- First commercial revenue generated directly from monetising Metallium's proprietary Flash Joule Heating platform.
- Independent 3rd-party validation of the commercial value of Metallium's reactor technology & engineering expertise.
- Establishes Gator Point as a commercial technology campus capable of supporting strategic industry partners.
- Represents the first commercial implementation of Metallium's Processing-as-a-Service strategy.
- Creates a commercial template for future services, technology access, licensing & potential royalty arrangements.

COMMERCIAL TERMS

Under the agreement, Metallium will receive (Phase-1):

- **US\$500,000 upfront cash payment;**
- **US\$225,000 quarterly engineering support and facility service fees** during the 12-month term;
- **20 million ECT options**, exercisable at A\$0.18 per share and expiring 12 months from issue (subject to ECT shareholder approval). ECT shares last traded at A\$0.135 on 23 July 2026, prior to the suspension of trading pending the announcement of the proposed MXene transaction. No value has been attributed to the options for the purpose of calculating the consideration figures set out above.

Total cash consideration over the initial 12-month term is up to US\$1.4 million (approximately A\$2.0 million based on an AUD/USD exchange rate of 0.7 as at 3 August 2026), excluding the value of the ECT options. Of this amount, US\$500,000 is payable unconditionally on execution and the remaining US\$900,000 is payable in quarterly payments of US \$225,000 commencing 1 November 2026.

Under the agreement, Metallium retains ownership of all existing and future intellectual property relating to its reactor systems, engineering improvements, process developments and technology enhancements, while ECT will own MXene product produced during the agreed research programme. The agreement also includes comprehensive protections preventing reverse engineering, replication and unauthorised use of Metallium's proprietary technology. The parties have also agreed to negotiate in good faith a **potential longer-term commercial licence and royalty agreement (Phase-2)** following completion of the initial programme. The agreement does not oblige either party to enter into such a licence. The agreement is legally binding on the parties. It has an initial term of 12 months and may be terminated by either party for material breach or on insolvency of the other party, and by either party on 90 days' written notice. ECT is not a related party of MTM.

ABOUT MXENES: TWO-DIMENSIONAL TRANSITION METAL CARBIDES AND NITRIDES WITH EXCEPTIONAL PROPERTIES FOR A WIDE RANGE OF HIGH-PERFORMANCE APPLICATIONS

MXenes are an emerging family of advanced two-dimensional (2D) transition metal carbides and nitrides, most commonly based on titanium, produced from precursor feedstock materials known as 'MAX phases'. MAX phases are layered ceramic materials comprising alternating atomic layers of a transition metal (such as titanium), carbon and a relatively weakly bonded "A" element (typically aluminium). Selectively removing the "A" layer produces atomically thin MXene sheets, typically only one to two nanometres thick. These ultrathin materials combine exceptional electrical conductivity, high surface area, tunable surface chemistry, mechanical flexibility and hydrophilic characteristics, giving rise to a unique combination of properties that has attracted significant global research and commercial interest.

These exceptional characteristics position MXenes as a potential enabling material across a broad range of high-performance applications, including **advanced defence materials**, **electromagnetic interference (EMI) shielding**, **high-performance electronics**, **thermal management**, **sensors**, **catalysis**, **water treatment**, and **next-generation energy storage technologies** such as **batteries** and **supercapacitors**.

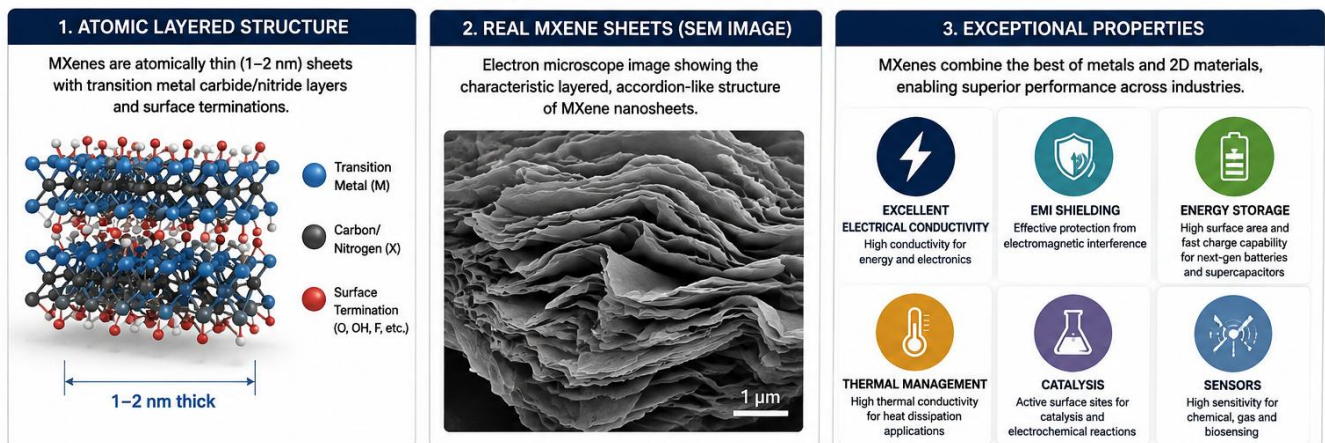


Figure 1: Overview of MXenes, illustrating their atomically layered structure, representative morphology and key functional properties (Source: Pogorielov, M. et al., 2021; ECT (2026)).

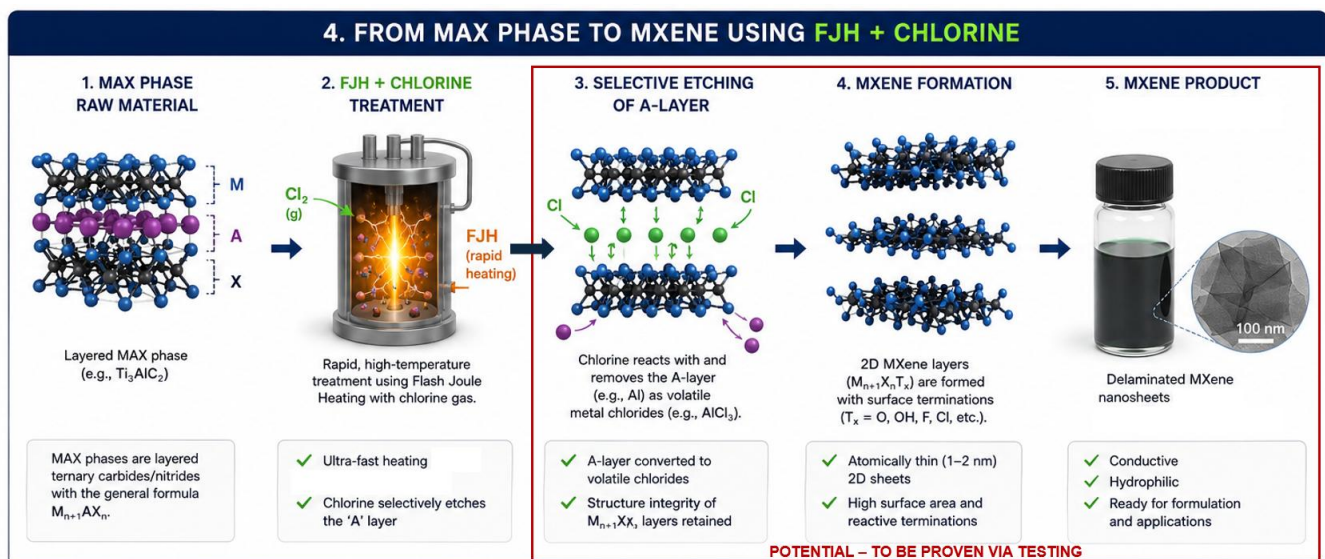


Figure 2: Conceptual illustration of the proposed and potential FJH production pathway for MXenes. Layered MAX phase precursor materials are subjected to rapid FJH in the presence of chlorine to selectively remove the "A" layer as volatile metal chlorides, producing atomically thin two-dimensional MXene sheets with surface terminations (T_x) for subsequent delamination and downstream applications. Illustration is conceptual and not intended to represent an actual process flow or operating conditions. **Conceptual illustration developed by Metallium.** Scientific concepts adapted from Pogorielov, M. et al., 2021.

Despite this significant potential, commercial adoption has remained limited because **conventional manufacturing methods typically rely on hazardous hydrofluoric acid (HF)-based chemical etching** to selectively remove the "A" layer from MAX phase precursors. These processes are generally **slow, difficult to scale, environmentally challenging and relatively expensive, resulting in constrained commercial production despite rapidly growing industrial demand**.

ECT believes Metallium's proprietary Flash Joule Heating platform has the potential to provide a faster, more scalable and more energy-efficient production pathway for MXenes. Rather than relying on conventional HF-based chemical etching, the process will be evaluated as an alternative approach for selectively removing the "A" layer from MAX phase precursors using rapid Flash Joule Heating in the presence of chlorine. Under the agreement, ECT will utilise Metallium's Gator Point Technology Campus, proprietary FJH reactor systems and engineering expertise to evaluate and optimise the application of FJH technology for commercial MXene production.

ABOUT ECT

Environmental Clean Technologies Limited (ASX: ECT) is an Australian technology company focused on the development and commercialisation of innovative environmental and advanced materials technologies. The Company's technology portfolio includes Rapid Electrothermal Mineralisation (REM), which applies Flash Joule Heating technology under an exclusive Rice University licence for the remediation of PFAS-contaminated soils and activated carbon, together with its proprietary COLDry drying technology. ECT has expanded its Flash Joule Heating technology portfolio via an exclusive licence to commercialise Flash Joule Heating technology for the production of MXenes.

The Engineering Agreement combines ECT's exclusive commercial rights for MXene production using FJH with Metallium's proprietary Flash Joule Heating reactor platform, engineering capability and Gator Point Technology Campus, providing an accelerated and capital-efficient pathway to evaluate and commercialise scalable MXene production. For more information, see <https://ectltd.com.au/about/>

METALLIUM'S COMMERCIALISATION STRATEGY

While Metallium's immediate commercial priority remains deploying its FJH technology through **Build, Own & Operate** facilities recovering critical and precious metals from electronic waste and other strategic feedstocks, the Company has consistently viewed FJH as a platform technology with applications extending well beyond critical minerals processing.

The agreement demonstrates that Metallium's proprietary reactor technology, engineering capability and operational know-how have commercial value across adjacent advanced manufacturing sectors. Importantly, the agreement also validates the Company's investment in its Gator Point Technology Campus, which has evolved beyond an internal development facility into a commercial technology centre capable of supporting strategic partners seeking to accelerate the commercialisation of FJH-enabled applications.

The Company intends to commercialise its proprietary FJH platform through complementary business models depending on the application and customer requirements:

- **Build, Own & Operate (Core Strategy)**
Metallium owns and operates FJH processing facilities, generating revenue through the recovery and sale of critical and precious metals.
- **Processing-as-a-Service**
For selected applications and strategic partners, Metallium intends to provide access to its proprietary FJH platform through commercial arrangements that may include reactor deployment, equipment supply, operator support, technology licences and, where appropriate, ongoing processing fees and royalty arrangements.

Typical commercial pathway:

- Technology Services
- Pilot & Demonstration
- Commercial Deployment
- Long-term Processing-as-a-Service Agreement

Potential revenue streams include:

- Engineering services
- Technology licences
- Reactor & equipment supply
- Operator support
- Services and spare parts
- Processing fees
- Royalties

The ECT agreement represents the first commercial implementation of this Processing-as-a-Service pathway, commencing as a Technology Services engagement with the potential to progress, subject to successful outcomes and future agreement between the parties, toward a longer-term Processing-as-a-Service commercial arrangement.

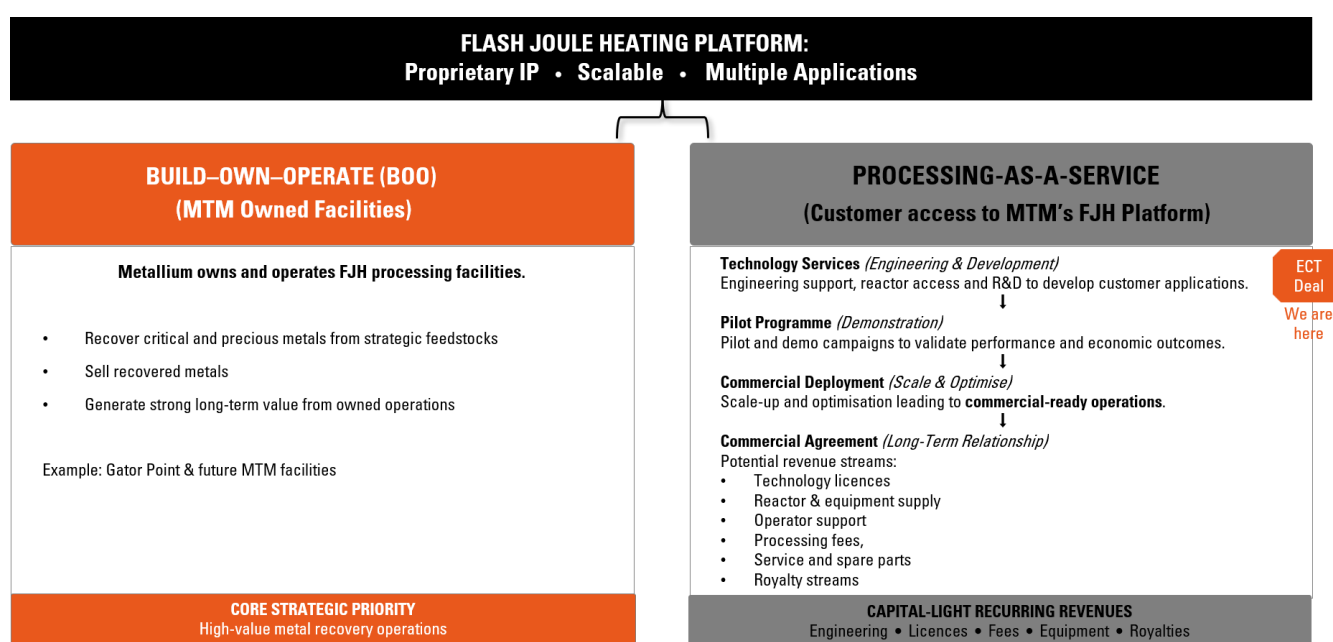


Figure 3: Metallium is commercialising its proprietary Flash Joule Heating platform through complementary Build, Own & Operate and Processing-as-a-Service strategies, enabling both owned operations and capital-light third-party growth opportunities.

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

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ABOUT METALLIUM LIMITED

Metallium Ltd (ABN 27 645 885 463), is pioneering a low-carbon, high-efficiency approach to recovering critical and precious metals from mineral concentrates and high-grade waste streams. The company's patented **Flash Joule Heating (FJH)** technology enables the extraction of high-value materials, including **gallium, germanium, antimony, rare earth elements, and gold** — from feedstocks such as refinery scrap, e-waste, and monazite.

Aligned with U.S. strategic supply chain objectives, Metallium has recently secured its first commercial site in Texas via its wholly owned subsidiary, **Flash Metals USA Inc.**, marking a major step toward near-term production and revenue generation.

To learn more, visit:

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REFERENCE:

Pogorielov, M. et al. (2021). *MXenes—A New Class of Two-Dimensional Materials: Structure, Properties and Potential Applications*. *Nanomaterials*, 11(12), 3412, [LINK](#).

FORWARD-LOOKING STATEMENTS

This announcement contains forward-looking statements concerning Metallium Limited (Metallium or the Company), including statements regarding the performance and outcome of the research and development programme to be undertaken under the agreement, the potential application and scalability of FJH technology for commercial MXene production, the possible negotiation of a longer-term commercial licence and royalty agreement, the potential to establish a repeatable technology-monetisation model, anticipated commercial deployment activities, and the Company's future plans, strategy and objectives.

Forward-looking statements can generally be identified by the use of words such as “may”, “will”, “expect”, “intend”, “plan”, “estimate”, “anticipate”, “believe”, “target”, “forecast”, “project”, “potential”, “continue”, “should”, “seek”, and similar expressions.

These statements are based on information available to Metallium as at the date of this announcement and on assumptions and expectations that the Company considers to be reasonable as at that date, including assumptions regarding: continued successful operation and reliability of the FJH reactor platform; the availability and characteristics of suitable feedstock; the timing and outcome of ongoing commissioning and optimisation activities; the availability of capital, equipment, personnel, services, regulatory approvals and site access required to perform the Company's obligations under the agreement; ECT obtaining the shareholder approvals required for certain fee payments and for the issue of the options; the absence of material adverse changes in commodity prices, exchange rates, input costs and general economic and market conditions; and continued progress of customer, partner and offtake discussions.

Forward-looking statements are not guarantees or predictions of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond the Company's control. Actual results, performance or achievements may differ materially from those expressed or implied by the forward-looking statements. Such risks and uncertainties include, but are not limited to: technology scale-up and commissioning risk; feedstock supply, grade and recovery variability; processing throughput and yield variability; capital and operating cost variability; financing risk; regulatory, permitting and environmental risk; intellectual property risk; reliance on key personnel, contractors and partners; competition; and broader macroeconomic, market and geopolitical conditions.

Anticipated commercial outcomes, potential licensing or royalty arrangements and timelines referred to in this announcement are indicative only. They are not forecasts and are subject to the assumptions, risks and uncertainties described above. There is no guarantee that these targets will be achieved, in the timeframes indicated or at all.

Investors should not place undue reliance on forward-looking statements. Except as required by the ASX Listing Rules, the Corporations Act 2001 (Cth) and applicable law, Metallium does not undertake any obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.