METALLIUM LIMITED
ASX: MTM | OTCQX: MTMCF | MTLMY (ADR)
Australia: Perth, Western Australia
USA: Houston, Texas

ASX Release

18 November 2026

Metallium commissions upgraded MXene FJH reactor at Gator Point

Reactor operation and initial product analysis now on one site for Metallium's first revenue-generating technology-services program

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- **Upgraded Flash Joule Heating (FJH) reactor commissioned at Gator Point:** cold and hot commissioning complete, including temperature control and the chlorination off-gas scrubbing system.
- **ECT MXene campaign scheduled to start this week:** approximately 400 grams of ECT-supplied precursor in the first campaign in the upgraded reactor, focused on conversion and consistency between batches.
- **Analysis on site:** a newly procured X-ray diffractometer means samples are analysed at Gator Point, so results from each run set the conditions for the next.
- **Paid program, Metallium IP:** US$500,000 payment received, with an additional US$225,000 to be paid per quarter, up to US$1.4M over 12 months, with Metallium retaining all reactor and process IP. A 2nd reactor upgrade is underway.

Metallium Limited ("*Metallium*" or the "*Company*") (*ASX: MTM; OTCQX: MTMCF; OTCQX ADR: MTLMY*) has commissioned an upgraded Flash Joule Heating (FJH) reactor at its 'Gator Point' Technology Campus in Anahuac, Texas, with its first MXene campaign in the reactor scheduled to begin this week. The work is carried out for Environmental Clean Technologies Limited (ASX: ECT) under the 12-month R&D and engineering services agreement announced on 4 August 2026, Metallium's first commercial technology-services agreement. FJH-chlorination technology is being employed to convert a ceramic precursor feedstock ('Max-Phase') into 'MXene', an advanced material being developed for electromagnetic shielding, electronics and energy storage.

The ECT program is Metallium's first commercial application of FJH beyond metals recovery. ECT funds the work and Metallium provides reactor access, engineering support and technical expertise, while retaining all existing and future reactor and process intellectual property. ECT owns the MXene product. This is the technology-services model the Company outlined at its 2026 AGM, and any longer-term licence and royalty arrangement with ECT remains subject to further agreement.

The MXene program uses the same FJH heating and chlorination chemistry Metallium is developing for critical-metal recovery at Gator Point, including its U.S. Defense Logistics Agency-funded gallium and germanium work. Applied to MAX feedstock, this process selectively removes aluminium to produce titanium carbide MXene. The work runs alongside Metallium's PCB processing program, with initial revenue from PCB metal products still conservatively anticipated in the first half of calendar 2027.

Metallium Chief Operating Officer Ibrahim Ayoub commented: *"Commissioning has confirmed heating performance, temperature control and the off-gas treatment system. From here the work is about conversion, optimisation and consistency from batch to batch, and with analysis on site, results from one run can set the conditions for the next."*

Metallium Managing Director and CEO Michael Walshe commented: *"This is the model we set out at our AGM: a partner funds a new application on our reactors, and Metallium keeps the reactor and process IP. MXenes take the FJH platform beyond metals recovery, and the work draws on the same chlorination capability we are building for critical metals at Gator Point."*

MXENE CAMPAIGN AND NEXT STEPS

The campaign will initially process approximately 400 grams of ECT-supplied titanium aluminium carbide precursor. The reactor heats the precursor in the presence of chlorine, which selectively removes the aluminium layers to produce titanium carbide MXene. Conventional MXene production typically uses highly corrosive and toxic hydrofluoric acid to remove aluminium. The process can take hours to days per batch and generates hazardous liquid waste requiring specialised treatment and disposal.

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ECT reported MXene formation in its first two runs on Metallium's FJH platform on 9 October 2026. This campaign will focus on improving conversion and consistency between batches and on assessing the product against application requirements, with samples from each run analysed in the on-site laboratory. A second reactor is being upgraded in parallel, incorporating improvements from the first.

Metallium expects to provide an update on the campaign and progress with the second reactor in its December quarter report, subject to completion of testing and validation of the results.

COMMISSIONING

The program covered the power supply, process piping, gas-handling lines and scrubbers to treat off-gas from chlorination, with civil, electrical, controls and process engineering completed ahead of commissioning. Cold commissioning verified equipment, utilities, instrumentation and controls without process material, including leak testing, safety interlocks and shutdown functions. Hot commissioning confirmed heating performance, temperature control at the target setpoint and operation of the off-gas scrubbing system.

COMMERCIAL TERMS

Under the agreement, ECT paid US$500,000 upfront, which has been received, and pays a quarterly engineering support and facility service fee of US$225,000, for total cash consideration of up to US$1.4 million over the initial 12-month term. ECT shareholders approved the issue of 20 million ECT options to Metallium, exercisable at A$0.18 and expiring 12 months after issue, on 22 October 2026, and these have been received by Metallium.

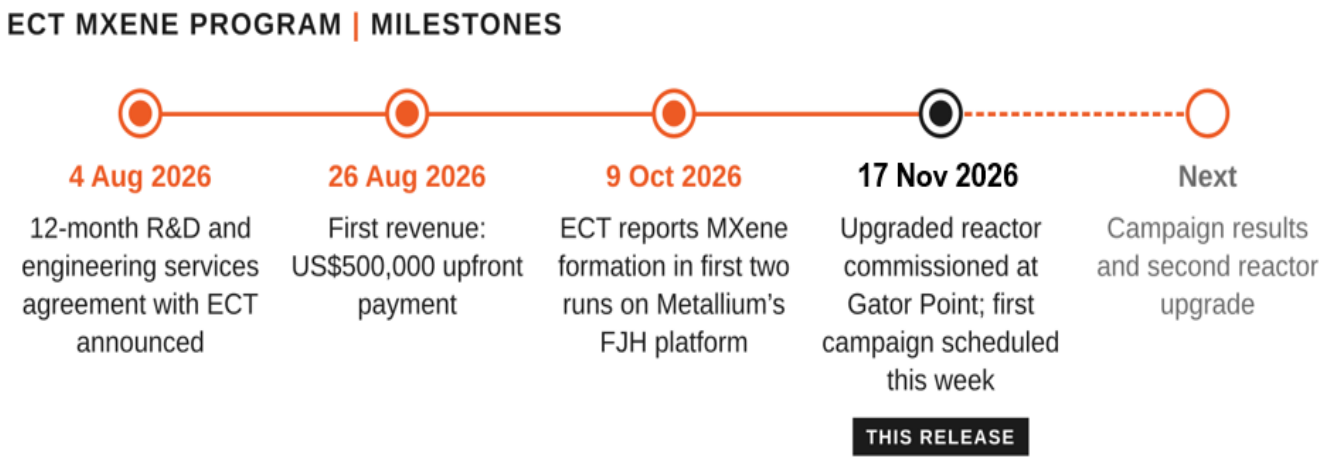


Figure 1. *Milestones in the ECT MXene program to date.*

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Figure 2. *One of several Flash Joule Heating reactor systems installed at Gator Point.*

ABOUT MXENES

MXenes are a family of two-dimensional (2D) materials, most commonly titanium carbide, made from layered ceramic precursors known as 'MAX phases'. A MAX phase stacks atomic layers of a metal such as titanium, carbon and a weakly bonded "A" element, typically aluminium. Removing the aluminium leaves sheets of metal carbide only one to two nanometres thick, with metallic electrical conductivity and a very high surface area, that can be processed into thin coatings, films and composites.

That combination has drawn defence and electronics interest for electromagnetic shielding. In a 2016 study published in Science[1], a titanium carbide MXene film 45 micrometres thick, thinner than a human hair, achieved electromagnetic interference shielding of 92 decibels, the highest reported at the time for a synthetic material of comparable thickness. Most MXene is still made in small batches using hydrofluoric acid-based processes, which has constrained supply. Other potential applications include electronics, thermal management, sensors, water treatment and next-generation batteries and supercapacitors.

ABOUT ENVIRONMENTAL CLEAN TECHNOLOGIES

Environmental Clean Technologies Limited (ASX: ECT; OTCQB: ECTHF) is commercialising MXenes produced using FJH, with defence as its initial target market.

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

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[1] Shahzad F, Alhabeb M, Hatter CB, Anasori B, Man Hong S, Koo CM, Gogotsi Y. Electromagnetic interference shielding with 2D transition metal carbides (MXenes). Science. 2016 Sep 9;353(6304)

ABOUT METALLIUM LIMITED

Metallium Ltd (ABN 27 645 885 463), is developing and commercialising Flash Joule Heating (FJH) technology to recover critical and precious metals from mineral concentrates and selected waste streams. Through its wholly owned subsidiary, Flash Metals USA Inc., the Company operates the Gator Point Technology Campus in Texas, supporting technology development, customer testwork, commercial technology services and the staged deployment of metal-processing operations.

To learn more, visit:

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FORWARD LOOKING STATEMENTS

This announcement contains forward-looking statements concerning Metallium Limited (Metallium or the Company), including statements regarding the planned MXene campaign, payments and options under the ECT agreement, process performance, consistency between batches, product applications and qualification, further reactor upgrades, the timing of PCB processing revenue and the development and scale-up of FJH. These statements relate to future events and circumstances and are subject to uncertainty.

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 at the date of this announcement and on assumptions and expectations considered reasonable at that date. They include assumptions regarding successful technology development and scale-up; suitable feedstock supply; process performance and project economics; customer qualification and demand; access to capital, equipment, personnel and infrastructure; and regulatory approvals.

Forward-looking statements are not guarantees or predictions of future performance. They involve known and unknown risks and uncertainties, many beyond the Company’s control. Actual outcomes may differ materially due to technology scale-up and commissioning risk; feedstock variability; recovery, purity and product-qualification outcomes; capital and operating costs; funding availability; market prices and demand; regulatory or policy changes; and the actions of counterparties and customers.

Potential commercial outcomes and any development timelines are indicative only and are not production, revenue or earnings forecasts. There is no assurance that anticipated outcomes will be achieved, within an indicated timeframe 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.

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