For personal use only

ASX Announcement

4 August 2026

ECT to Acquire Exclusive Rice University Flash Joule Heating Technology for Commercial MXene Production

Building a scalable Flash Joule Heating platform to seek to unlock commercial-scale MXene production for advanced materials markets

Highlights:

- ECT has entered into a binding agreement to acquire 100% of Xenica Materials Pty Ltd (**Xenica**), securing an exclusive right to use Rice University's proprietary Flash Joule Heating (**FJH**) technology for the production of MXenes and 2D amorphous carbon.
- The acquisition expands ECT's FJH platform into advanced materials, creating exposure to high-growth sectors including defence, aerospace, energy storage and electronics, while complementing the Company's existing PFAS remediation initiatives.
- For more than a decade, MXenes have been recognised as one of the most promising classes of advanced materials. However, traditionally hazardous, hard-to-scale, and costly production has confined the market, stunting commercial adoption and leaving its full value unrealised.
- FJH has potential to significantly reduce MXene production times from hours or days to minutes, providing a scalable, lower-cost and environmentally responsible manufacturing process.
- MXene production is protected by various patents. Xenica is currently progressing discussions to obtain a licence to be able to produce MXenes for military end-use, which is expected to provide an important initial commercialisation pathway into one of the highest-value markets.
- Potential applications include electromagnetic shielding, radar and infrared signature management, advanced sensing technologies, fast-charging batteries, water treatment and next-generation electronic devices.
- The Board believes FJH has the potential to overcome one of the greatest barriers to commercial MXene adoption, being the ability to manufacture high-quality material economically at an industrial scale.
- The Board sees potential for MXene-based filtration membranes to complement ECT's existing Rapid Electrothermal Mineralisation technology, opening a further pathway to extend the Company's PFAS remediation capability into the water industry, while following the Company's capital-light commercialisation approach.
- ECT has received firm commitments from sophisticated, professional, and institutional investors, to raise up to A$12 million (before costs) through a strongly supported placement.

For personal use only

Environmental Clean Technologies Limited (ASX: **ECT**) (**ECT** or **Company**) is pleased to announce it has entered into a binding Share Purchase Agreement to acquire 100% of Xenica Materials Pty Ltd (**Xenica**) (**Acquisition**). Xenica holds an exclusive licence from William Marsh Rice University (**Rice University** or **Rice**), through its wholly owned subsidiary, to use Rice's proprietary Flash Joule Heating (**FJH**) technology for the production of MXenes and two-dimensional amorphous carbon (**Licence Agreement**). A summary of the material terms of the Licence Agreement is detailed in **Schedule 2.**

The Acquisition represents an important strategic milestone in ECT's evolution into a diversified and advanced technology business centred on the commercial application of FJH. The Board believes FJH is capable of supporting multiple complementary commercial applications, including its existing applications in per- and polyfluoroalkyl substances (**PFAS**) remediation and future opportunities across advanced materials manufacturing and industrial processing.

The Acquisition extends ECT's FJH platform beyond the Company's existing PFAS remediation and environmental technology applications into MXenes and two-dimensional amorphous carbon.

MXenes are a distinct, high-performance class of advanced material, with potential applications spanning electromagnetic shielding for radar and infrared-absorbing materials, advanced sensing technologies, fast-charging batteries, water treatment and next-generation electronic devices. For over a decade, this potential has gone largely unrealised, with industry-wide reliance on hazardous, slow, and expensive acid-based etching confining MXenes production largely at the laboratory scale. By replacing hazardous, slow chemical etching with a rapid, lower-waste electrical process, FJH has the potential to materially lower the cost and time of production and unlock the true size of this market.

The Acquisition is underpinned by strong investor support, with the Company securing firm commitments to raise up to A$12 million (before costs) from sophisticated and institutional investors.

On the announcement, ECT's Chairman, Faldi Ismail, said: "*Our strategy has been consistent and deliberate, to selectively secure complementary technologies that expand the commercial reach of our Flash Joule Heating platform. Last year's acquisition of Terrajoule was the first step in executing that strategy. Today's acquisition of Xenica is the second, materially expanding our addressable market.*

"For more than a decade, the commercial potential of MXenes has been constrained not by demand, but by the industry's ability to manufacture them economically at scale. We believe Flash Joule Heating has the potential to break through that production ceiling and unlock the next phase of commercial adoption.

"This acquisition reinforces our conviction that Flash Joule Heating is becoming a platform technology capable of supporting multiple high-value industrial applications. We see a particular near-term opportunity in defence, where the ability to produce MXenes in large quantities, as a versatile, stable powder gives us a genuine point of difference.

"We are building ECT to deliver returns across multiple high-value markets, not just one. Xenica is the next disciplined step in that strategy, and it materially expands the addressable market this platform can capture."

MXenes - A Significant Commercial Opportunity

MXenes are a family of two-dimensional inorganic nanomaterials consisting of atomically thin transition metal carbides, nitrides or carbonitrides that were first discovered in 2011 and are now recognised as one of the fastest emerging classes of advanced materials in science.

For personal use only

Structurally similar to graphene but chemically distinct, MXenes combine metallic electrical conductivity with a surface chemistry which can be precisely tuned for a specific end use, a combination rarely found together in a single advanced material.

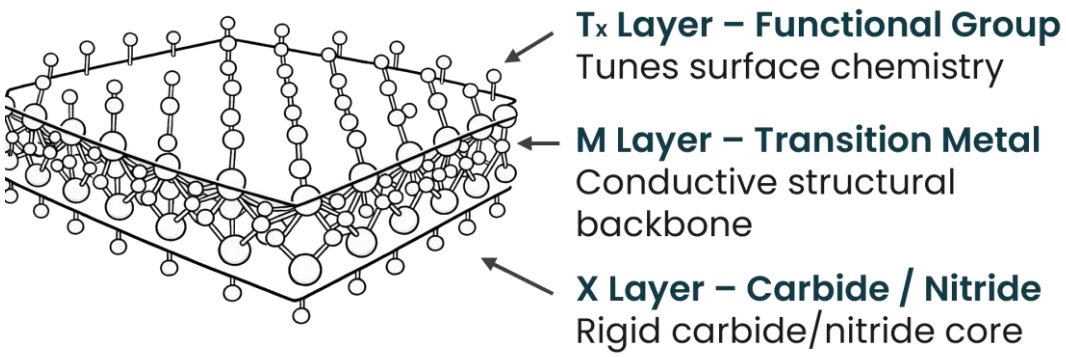

Image 1: *MXene Atomic Structure*

This combination of properties has made MXenes a focus of sustained research and commercial interest across sectors such as defence, aerospace, electronics, energy storage, advanced coatings and environmental technologies. Underpinned by exceptional electrical conductivity, hydrophilicity and highly tuneable surface chemistry, MXenes have proven to be highly desirable across a range of industries, yet this potential has remained substantially unrealised.

The main bottleneck facing MXenes is its high cost of production, as traditional production methods consist of multi-day batch processes that use harsh acids, requiring significant environmental remediation costs. Additionally, these methods produce less than 100g of material per batch, causing high-quality US-produced MXene powders to market for upwards of US$100/g.

Flash Joule Heating - Breaking Through the Production Ceiling

MXenes are produced by first loading the FJH reactor with the precursor ceramic material known as a MAX phase, also of variable chemistry depending on the end-use case. Once loaded, the reaction initiates by rapidly heating the MAX phase up to 1500°C through radiant heating, which is heating done by visible and infrared radiation. During this heating, chlorine gas passes through the chamber from a closed-loop system, ensuring operator safety. Passing through the MAX powder, the central binding layer of the MAX phase, typically aluminum or silicon, reacts with the chlorine and flows out of the reactor as a gas and into a collector, thereby etching and purifying the MXenes simultaneously. The kinetics of this etching process rapidly increase under the high temperature conditions of FJH, and thus exponentially decrease the necessary reaction time. As the central layer of the MAX phase is etched away, the MXenes form from the opening of these layers that were initially locked into the MAX phase's hard ceramic structure, affording a high surface area, chemically tunable 2D material.

FJH has the potential to fundamentally change the economics of MXene production. Rather than requiring lengthy chemical processing, FJH utilises ultra-rapid electrical heating to convert precursor materials into high-value products within minutes. The technology offers the potential to significantly reduce production time, simplify manufacturing, lower operating costs, and improve scalability while reducing environmental impacts.

For personal use only

An additional advantage of FJH is the physical form in which it produces MXenes. Conventional production methods typically yield MXenes as an aqueous dispersion, which is prone to oxidation, has a limited shelf life and is generally confined to thin-film, ink, and coating applications. FJH instead produces MXenes as a stable powder, which can be processed and integrated across a substantially broader range of forms, including composites, structural materials, textiles, and coatings. For end users who require materials that can be engineered into diverse platforms and applications, this versatility is expected to be a meaningful commercial differentiator.

Initial Target Market – Military End Use

The defence industry represents a significant commercial opportunity for FJH-produced MXenes, where there is increasing demand for advanced materials offering high electrical conductivity, lightweight performance and durability. Within the defence industry, near-term interest centres on EMI shielding to protect sensitive electronics from interference, and infrared (**IR**) signature management to reduce the detectability of personnel, vehicles and equipment, applications for which MXenes' powder form, in contrast to a liquid dispersion, offers a materially wider range of integration options.

The key to MXenes' attractiveness in EMI shielding and IR signature management is its ability to absorb rather than reflect electromagnetic waves, to provide equivalent shielding with less weight and bulk versus incumbent materials and to be sprayed and applied onto almost any surface while providing joint protection from EMI and IR in a single application.

MXene production is protected by various patents. Xenica is currently progressing discussions to obtain a licence to enable production of MXenes for military end use. Obtaining this licence is expected to provide ECT with an initial commercial pathway into defence applications while the Company continues to look at other licencing requirements to pursue broader commercial opportunities across other end-use markets.

Future Opportunities

Whilst defence applications represent an attractive initial market, ECT's longer-term strategy is to expand the commercialisation of FJH-produced MXenes across a broad range of industrial sectors through additional end-use licensing arrangements over time.

MXenes have significant potential across a wide range of multi-billion dollar industries, including EMI shielding for the electronics industry, high-end supercapacitors, fast charging batteries and flexible bio-sensors. Corporations, such as Samsung, LG and Murata, have patents for flexible displays, battery electrodes and high-conductivity, spray-coated films respectively that FJH has the potential to unlock.

The Board also sees potential for MXene-based filtration membranes to complement ECT's existing Rapid Electrothermal Mineralisation technology, opening a further pathway to extend the Company's PFAS remediation capability into the water remediation sector. Together, these opportunities reinforce the Board's strategy of expanding the commercial applications of FJH across multiple high-value industries through a disciplined, capital-light commercialisation model.

Share Purchase Agreement

Under the terms of the share purchase agreement, ECT will acquire 100% of the issued shares in Xenica in consideration for 60,000,000 fully paid ordinary shares in the Company (**Consideration Shares**) (**SPA**). The Consideration Shares will be escrowed for a period of six months from the date of issue.

Completion of the Acquisition is subject to (amongst other matters) ECT obtaining shareholder approval to issue the Consideration Shares. ECT intends to seek shareholder approval for the issue of the Consideration Shares at a shareholder meeting to be held in or around October 2026 (**GM**).

A summary of the material terms of the SPA are detailed in **Schedule 1** of this announcement.

Placement

The Company is pleased to announce that it has received binding and firm commitments from sophisticated, professional and institutional investors to raise up to A$12 million (before costs) through a two-tranche placement of 100 million fully paid ordinary shares (**Shares**) at an issue price of A$0.12 per Share (**Placement**).

The Placement provides ECT with the capital required to accelerate commercialisation of its expanding FJH platform.

The Placement will be completed in two tranches as follows:

- **Tranche 1**: 88.7 million Shares will be issued under the Company's existing Listing Rule 7.1 and 7.1A capacity to raise A$10.6 million (before costs) and
- **Tranche 2**: the issue of the remaining 11.3 million Shares to raise A$1.4 million (before costs) will be subject to the Company obtaining shareholder approval.

Completion of the Tranche 1 Placement is expected to occur on Tuesday 18th August 2026. The Tranche 2 Placement is subject to the Company obtaining shareholder approval, which will be sought at the GM.

The Shares to be issued pursuant to the Placement will, upon their issue, rank equally with the existing fully paid ordinary shares in the Company.

The funds raised from the Placement will accelerate commercialisation of the FJH platform, support PFAS remediation, MXene manufacturing capability and working capital for growth.

Peloton Capital & AE Advisors Group (**Joint Lead Managers**) will act as Joint Lead Managers to the Placement. The Company will pay the Joint Lead Managers a capital raising fee of 6% of the amount raised and, subject to shareholder approval, will issue the Joint Lead Managers (and/or its nominees) 10 million options, each with an exercise price of A$0.18 expiring 3 years from the date of issue (**Placement Options**).

This announcement is authorised for release to the ASX by the Board.

For further information, please contact:

INVESTORS

Faldi Ismail
Chairman

info@ectltd.com.au / +613 9849 6203

Stephanie Richardson
Sodali & Co

stephanie.richardson@sodali.com / +61 423 459 440

For personal use only

Forward-looking Statement

This announcement may contain forward-looking statements regarding future events or performance, including but not limited to projections of financial results, anticipated growth, and business strategies. These forward-looking statements are based on current expectations, assumptions, and projections that involve inherent risks and uncertainties. Actual results may differ materially from those anticipated due to various factors, including market conditions, regulatory changes, technological advancements, and economic conditions.

Investors are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date of this announcement. The Company undertakes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events, or otherwise, except as required by applicable securities laws.

Investors should carefully consider the risks and uncertainties disclosed in the Company's periodic reports filed with the Australian Securities Exchange (ASX) and other regulatory authorities. Forward-looking statements are provided as of the date of this announcement, and the Company disclaims any obligation to update them, except as required by law.

For personal use only

Schedule 1 – Material Terms of the SPA

Sellers	The shareholders of Xenica, including Rice University and Professor James Tour (the lead professor of the FJH technology), none of whom are related parties of the Company.
Buyer	Environmental Clean Technologies Limited.
Conditions Precedent	The conditions precedent to completion are (amongst other matters) as follows: - the Buyer obtaining shareholder approval for the issue of the Consideration Shares and, if required, Shares to be issued under the Placement; - there having been no circumstances arising or existing as at the date of the SPA and at any time from that date until completion of the SPA which would constitute or give rise to a breach of any of the Sellers' warranties; and - the Buyer undertaking, and receiving, valid applications and/or firm commitments in respect to a capital raising, (**Conditions Precedent**).
Completion	Completion will occur five (5) Business Days after the satisfaction or waiver of the last of any outstanding Conditions Precedent.
Consideration	The consideration payable by the Buyer to the Sellers is 60,000,000 Consideration Shares.
Escrow	The Consideration Shares will be escrowed for a six-month period commencing on the issue date of the Consideration Shares.
Other Terms	Customary terms for an agreement of this nature, including in relation to representations and warranties.

For personal use only

Schedule 2 –Material Terms of the Licence Agreement

Licensor	William Marsh Rice University (Rice University)
Licensee	Xenica Inc (a wholly owned subsidiary of Xenica)
Fees	Rice University is entitled to fees as follows: - an upfront licencing fee of USD$40,000; - an annual licence maintenance fees of USD$10,000 per annum; - a technology research fee of USD$350,000 over a 24-month period; and - an assignment fee of USD$100,000 (if applicable).
Royalties	Rice is entitled to a royalty of 2% of gross sales attributable to the licence (subject to minimum payments of USD$10,000 in years 1 to 2, USD$20,000 in years 3 to 5 and USD$30,000 from year six onwards).
Non-Sale Based Sublicence Consideration	Rice is entitled to a non-sale-based sublicence consideration as follows: - 30% from 0 to 24 months; - 25% from 25 to 72 months; and - 15% from 73 months onwards.
Milestone Payment	Rice is entitled to milestone payments as follows: - USD$50,000 upon receipt of at least USD$7,500,000 funding for the development and commercialisation of licenced products; - USD$75,000 upon achieving sales of USD$15,000,000 in cumulative worldwide gross sales of licenced products; - USD$150,000 upon achieving sales of USD$50,000,000 in cumulative worldwide gross sales of licenced products; and - USD$350,000 upon achieving sales of USD$100,000,000 in cumulative worldwide gross sales of licenced products.
Exit Fee	On completion of the Acquisition, Rice will be entitled to an exit fee of, 0% of the first A$5M of consideration, 0.5% of the consideration between A$5M and A$10M, and 0.25% of any consideration over $A10M.
Other Terms	Other customary terms for an agreement of this nature.

For personal use only