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LU7 AND MACQUARIE UNIVERSITY COLLABORATE WITH CSIRO FOR INDUSTRY PHD RESEARCH ON PV RECYCLING

Highlights

- Joint LU7–Macquarie University–CSIRO research project successfully selected
- Four-year program advances LU7's solar-panel recycling technology
- Microwave delamination separates panels without crushing or contamination
- Enables higher-quality recovery of silicon, glass, silver and other metals
- CSIRO and Macquarie University provide specialist expertise and facilities
- Independent CSIRO involvement strengthens LU7's scientific credibility
- Reduces LU7's research and technology-development costs
- Supports pilot-scale design, commercial modelling and technical validation
- Creates valuable intellectual property and commercialisation opportunities

Lithium Universe Limited (ASX: LU7) ("Lithium Universe" or "the Company") is pleased to announce that LU7 and Macquarie University jointly submitted a proposed research project (EOI) for consideration under the CSIRO Industry PhD Program. Following its assessment, CSIRO has advised that the project titled **"Microwave-Assisted Recycling of End-of-Life Silicon Photovoltaic Modules"** has been successful.

The successful research project supports LU7's Silver Extraction PV Recycling Project by advancing microwave-assisted separation of end-of-life solar panels. The project will investigate how microwave energy can separate the different layers of end-of-life solar panels without crushing or contaminating them. This could allow valuable glass, silicon, silver and other metals to be recovered in higher-quality forms.

The **CSIRO Industry PhD Program** is a four-year research initiative bringing together CSIRO, an Australian university and an industry partner. It supports a PhD student to undertake applied research addressing a real industry challenge, combining academic expertise, CSIRO scientific capability, industry experience, professional development and a minimum 60-day industry placement.

The successful EOI establishes a proposed four-year research collaboration between Macquarie University, CSIRO and Lithium Universe. Dr Binesh Puthen Veetil will serve as the University supervisor, Dr Michael Batten as the CSIRO supervisor and Dr Jingyuan Liu from LU7 as the industry supervisor.

The project provides LU7 with independent scientific credibility through CSIRO, access to CSIRO and Macquarie University expertise and facilities, and four years of dedicated research focused on advancing LU7's recycling technology. It offers a cost-effective pathway to pilot-scale design, commercial modelling and validation of recovered-material quality, while supporting the development of potentially valuable intellectual property and strengthening LU7's credibility with government, investors and future industry partners.



Photo: Macquarie University Team headed by Dr Binesh Puthen Veetil

For the solar-panel recycling project:

Participant	Role
Macquarie University	Primary academic institution and university supervision
CSIRO	Scientific supervision, materials testing, characterisation and scale-up expertise
Lithium Universe	Industry partner, commercial direction, pilot testing and industry experience
PhD student	Conducts the research over approximately four years

PROJECT FOCUS

The research will develop and optimise a microwave-assisted delamination process that selectively heats the encapsulant within silicon photovoltaic modules. The objective is to separate the module layers intact and without cross-contamination, enabling the recovery of glass, silicon and metals in forms suitable for reuse in new products. The program will examine microwave system design, process parameters, module variability, recovered-material quality, lifecycle impacts and scale-up requirements. Performance will be assessed against recovery yield, purity, energy efficiency and commercial viability thresholds.

INDUSTRY ENGAGEMENT AND COMMERCIALISATION

The selected PhD candidate will complete a minimum 60-day Industry Engagement Component with Lithium Universe over the course of the candidature. Planned activities include pilot testing, feedstock assessment, end-user engagement, lifecycle assessment, techno-economic modelling and the design and costing of scaled trials. The collaboration is intended to generate validated process data and commercial insights that may support further development of Lithium Universe's photovoltaic recycling strategy. Any commercialisation, intellectual property and confidentiality arrangements will be governed by the definitive Collaboration Agreement.

NEXT STEPS

CSIRO will now commence its internal contract preparation process. A draft iPhD Collaboration Agreement between CSIRO, Macquarie University and Lithium Universe is expected to be issued for review before the end of October 2026. Following negotiation and execution of the agreement, the project will proceed to advertising, student selection, onboarding and university enrolment. CSIRO has advised that negotiation and execution of the Collaboration Agreement, together with award of the grant, is expected to take approximately 10 to 12 weeks from issue of the draft agreement. The earliest project commencement is approximately six months after the close of the EOI round, subject to timely agreement execution, successful student recruitment, background checks and enrolment.

GRANT FUNDING

For a student commencing in 2027, the total scholarship is approximately A\$207,143 over four years, comprising A\$155,433 funded by CSIRO and a A\$51,710 industry-funded top-up from LU7. The program also provides approximately A\$56,019 for project expenses and professional development, while Macquarie University has committed an additional A\$6,000 towards project expenses.

SCALE OF THE OPPORTUNITY

Australia currently generates approximately 3 million end-of-life solar panels, or 60,000 tonnes, annually¹, with annual waste forecast to increase to approximately 91,000 tonnes by 2030². Globally, annual PV module retirements are projected to reach approximately 500,000 tonnes by 2030 and more than 19 million tonnes per annum by 2060³. Each solar panel contains approximately 20 grams of silver⁴, implying approximately 60 tonnes of contained silver in Australia's current annual end-of-life panel stream alone.

1. Australian Government, Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2026), *Solar panels*. ([DCCEEW](#))
2. NSW Government (2025), *NSW leads the way towards national solar panel reuse and recycling scheme*. ([NSW Government](#))
3. Wang, C., Zuo, J., Chen, X. et al. (2026), *Towards an equitable future of global photovoltaic waste recycling*, *Nature*, 656, 888–896. ([nature.com](#))
4. Macquarie University (2025), *Macquarie's solar silver solution strikes gold*. ([lighthouse.mq.edu.au](#))

CHIEF EXECUTIVE OFFICER COMMENT

Lithium Universe Chief Executive Officer, Iggy Tan, said: "The successful EOI is an important endorsement of the strength of this collaborative research project and its potential contribution to Australia's circular economy. The project brings together complementary research and industry capabilities to address a growing challenge: recovering higher-value materials from end-of-life solar panels rather than consigning them to landfill."

For Lithium Universe, the program provides a structured pathway to advance microwave-assisted delamination from laboratory proof-of-concept towards a scalable commercial process. The proposed industry placement will also embed the PhD candidate within our technical and business development team, ensuring the research remains focused on practical process design, recovered-material quality and commercial viability."

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About Lithium Universe Limited (LU7)

Lithium Universe (ASX: LU7) is an emerging lithium development company focused on building a fully integrated lithium supply chain in North America. The company's flagship asset is the Bécancour Lithium Refinery project in Québec, which aims to produce battery-grade lithium carbonate. LU7 is led by a world-class team with extensive experience in lithium refining, project delivery, and global supply chain integration.

Authorised by the Chairman of Lithium Universe Limited



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Forward-looking Statements

This announcement contains forward-looking statements which are identified by words such as 'anticipates', 'forecasts', 'may', 'will', 'could', 'believes', 'estimates', 'targets', 'expects', 'plan' or 'intends' and other similar words that involve risks and uncertainties. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance and targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and are also forward-looking statements. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions and estimates regarding future events and actions that, while considered reasonable as of the date of this announcement and are expected to take place, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of our Company, the Directors, and management. We cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will occur and readers are cautioned not to place undue reliance on these forward-looking statements. These forward-looking statements are subject to various risk factors that could cause actual events or results to differ materially from the events or results estimated, expressed, or anticipated in these statements.

ABOUT LITHIUM UNIVERSE LIMITED

Lithium Universe Limited (ASX: LU7) ("Lithium Universe" or "the Company") is a forward-thinking company on a mission to close the "Lithium Conversion Gap" in North America and revolutionize the photovoltaic (PV) solar panel recycling sector.

SILVER EXTRACTION - PV SOLAR PANEL RECYCLING STRATEGY

As the global demand for solar energy expands, solar panel waste is projected to reach 60–78 million tonnes by 2050, making efficient recycling solutions critical. Silver is essential for solar panels, electronics, and electric vehicles due to its unmatched electrical conductivity. Industrial demand has surged, especially from photovoltaics and AI technologies, creating a global supply deficit. With production lagging, silver prices have soared, reinforcing the economic importance of efficient recycling.

Lithium Universe has responded by acquiring Macquarie University's Microwave Joule Heating Technology (MJHT) and Jet Electrochemical Silver Extraction (JESE) method, a breakthrough in recovering valuable metals from end-of-life PV panels. The first stage, developed by Macquarie University, is Microwave Joule Heating Technology (MJHT), a process that uses microwave energy to selectively heat silicon cells softening the ethylene vinyl acetate (EVA) encapsulant that binds a solar panel's layers. This enables room-temperature delamination of glass, silicon, and metal layers without crushing, furnaces, or toxic chemicals. The result is a clean separation of materials, drastically reducing energy use, emissions, and chemical waste while preserving the integrity of high-value silicon and silver components. Following delamination, Lithium Universe applies its Jet Electrochemical Silver Extraction (JESE) process, a micro-jet electrochemical system that directs a fine stream of dilute nitric electrolyte onto the silver pads of solar cells. This method achieves over 95% silver recovery at 96% purity, while using 83% less acid and no chemical additives. The process operates at just 5 volts, recycles its electrolyte, and produces zero heavy-metal waste, establishing a true closed-loop recycling system. Together, MJHT and JESE form a sustainable, scalable recycling platform that converts discarded solar panels into a renewable source of silver, silicon, and other critical materials, a vital step toward circularity in the global clean-energy supply chain.

LITHIUM DIVISION

Lithium Strategy: Closing the Lithium Conversion Gap

Lithium Universe is at the forefront of efforts to meet the growing demand for lithium in North America. As electric vehicle (EV) battery manufacturers prepare to deploy an estimated 1,000 GW of battery capacity by 2028, the need for lithium is expected to rise dramatically. However, with only a fraction of the required lithium conversion capacity in North America, LU7 is determined to play a pivotal role in reducing dependence on foreign supply chains. The company is planning to build a green, battery-grade lithium carbonate refinery in Bécancour, Québec, leveraging the proven technology developed at the Jiangsu Lithium Carbonate Plant. This refinery will produce up to 18,270 tonnes per year of lithium carbonate, focusing initially on the production of lithium carbonate for lithium iron phosphate (LFP) batteries. The refinery's smaller, off-the-shelf plant model ensures efficient operations and timely implementation, positioning LU7 as a key player in the emerging North American lithium market. With a strong leadership team, including industry pioneers like CEO Iggy Tan, LU7 is well-positioned to deliver this transformative project. The company's strategy is counter-cyclical, designed to build through the market downturn and benefit from the inevitable recovery, ensuring sustained exposure to the growing lithium demand.

Second Refinery Strategy

Lithium Universe Limited has launched a second lithium refinery strategy in the Port of Brownsville, Texas, complementing its planned flagship Bécancour project in Québec. The initiative creates a binational refining platform to address North America's lithium conversion shortage and strengthen supply chain resilience. Strategically located near the Port of Brownsville, the site offers deep-water access, low labour costs, and streamlined permitting within one of the U.S.'s most business-friendly regions. Leveraging a "copy and paste" design from the proven Bécancour refinery, the Texas project can be rapidly deployed to serve nearby gigafactories, aligning with U.S. policy incentives under the Inflation Reduction Act.