6 October 2025

LU7 AND MACQUARIE UNIVERSITY ACHIEVE MAJOR BREAKTHROUGH IN SILVER RECYCLING ELECTRODE DESIGN

Highlights

- LU7 and Macquarie University team announce breakthrough in solar panel recycling, advancing silver recovery through **innovative electrode tip designs**
- Research demonstrates nozzle geometry significantly influences efficiency, with **sharp conical electrodes providing superior performance**
- Precision-engineered sharp cone tips deliver uniform silver removal, minimizing residues and maximizing material recovery yields
- Improved recovery rates boost recycling revenues, reduce valuable metal waste, and enhance environmental sustainability outcomes
- Innovative electrode shapes preserve adhesion between silver and aluminium, protecting structural integrity and enabling wafer reuse
- Energy consumption remains stable, with concentrated electric fields directing efficiency toward targeted silver extraction zones
- **Industrial silver demand surges** from solar, electronics, EVs, and AI data centres, driving unprecedented market pressure
- **Record-breaking silver price**

Lithium Universe Limited (ASX: LU7, "Lithium Universe" or "the Company"), in collaboration with its research partners at Macquarie University, is proud to announce a significant breakthrough in its mission to advance efficient recycling technologies for end-of-life solar panels. In its latest investigation, the team examined **a range of silver extraction nozzle designs** to determine **how recovery efficiency could be improved**. Among the designs tested were cylindrical, blunt-cone, and sharp-cone geometries. The researchers focused on the electrode tool that delivers electric current during the recovery process, believing that its **geometry could dramatically influence performance**. Their findings indicate that nozzle design plays a critical role in how effectively silver can be removed from discarded solar cells, opening the door to transformative improvements in solar panel recycling. The finding may sound simple, but its impact is enormous. By machining **electrodes**

into sharp cone shapes, the research team has harnessed the natural laws of physics to **boost recycling performance**, reduce waste, and recover silver more uniformly than ever before. This development adds to the growing list of innovations under Lithium Universe's Electro-Jet (EJ) recycling platform, which is designed to unlock the full economic and environmental value of solar panel waste.

TEST PROGRAM

The test program, conducted by LU7's partner Macquarie University under the guidance of Dr. Binesh Puthen Veettil and Dr. David Payne, involved precision laser-cutting of solar silicon cells to expose the busbars and fine silver contacts typical of photovoltaic metallisation. Using the Jet Electrochemical Silver Extraction (JESE) method, a controlled 5 V potential was applied between the wafer and the jet, dissolving silver into a nitric electrolyte as silver nitrate. The dissolved silver was subsequently recovered through reverse electrochemical deposition onto a substrate, which was then rigorously analysed for recovery efficiency, distribution uniformity, impurity levels, and purity.

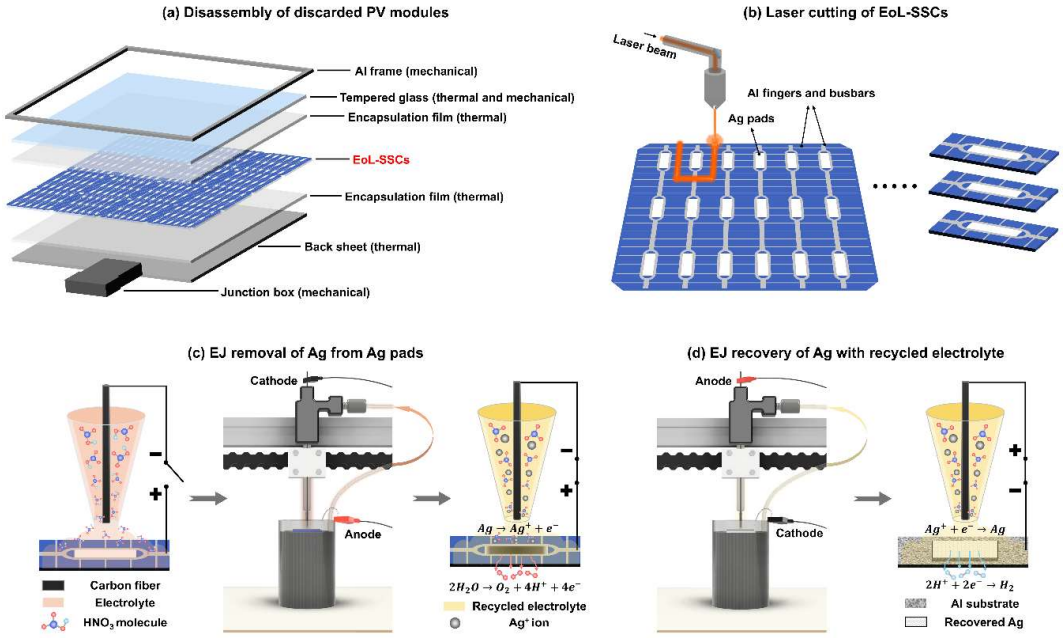


Figure 1 – Summary of Test Program

ELECTRODE TIP DESIGN

At the heart of this breakthrough is a surprisingly straightforward idea: change the shape of the electrode tip. Electrodes are the "tools" in an electrochemical process, guiding electricity through a liquid solution to target metals like silver. Traditionally, these electrodes are shaped like rods or cylinders, with a flat or slightly rounded end. In the new research, Macquarie University engineers modified the electrode tips into cones — some blunt (110° tip angle) and some sharp (45° tip angle). See Figure 2.

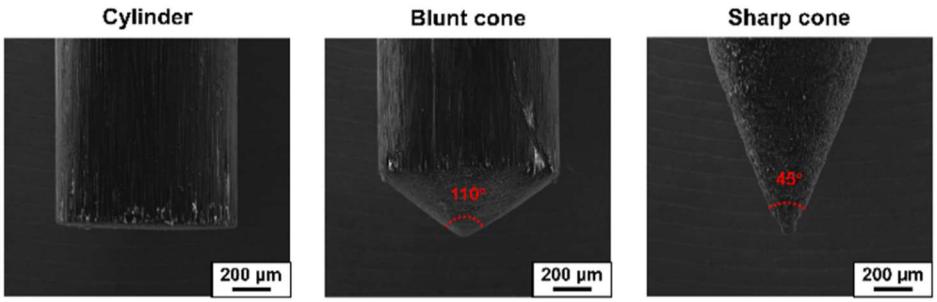


Figure 2 – Electrode Tip Shapes Under Tests

RESULTS OF THE STUDY

1. **Sharper tips removed more silver, more evenly.**
    - With cylindrical electrodes, silver was removed mainly in the centre, leaving stubborn residues at the edges.
    - With sharp cone tips (45°), **silver was stripped almost uniformly across the entire pad**. See Figure 3.
2. **Residues were greatly reduced.**
    - At the edges of the silver pads, residues fell dramatically as the electrode tip became sharper. See Figure 4.
    - This means less waste, more efficient recovery, and higher purity output.
3. **Adhesion between silver and aluminium was preserved.**
    - Blunt or flat electrodes caused peeling and delamination where the silver pad meets the aluminium busbars.
    - Sharp tips, by contrast, preserved strong adhesion, protecting the structure and avoiding unwanted material loss.
4. **Efficiency improved.**
    - Sharp conical tips achieved up to **75% silver removal efficiency in just three minutes** under standard operating conditions.
    - Even at high current densities, the sharp tips maintained strong performance and energy efficiency.
5. **Energy use remained stable.**
    - Despite concentrating the field, sharp tips did not waste energy. In fact, they kept current efficiency high by directing the electric field precisely where it was needed.

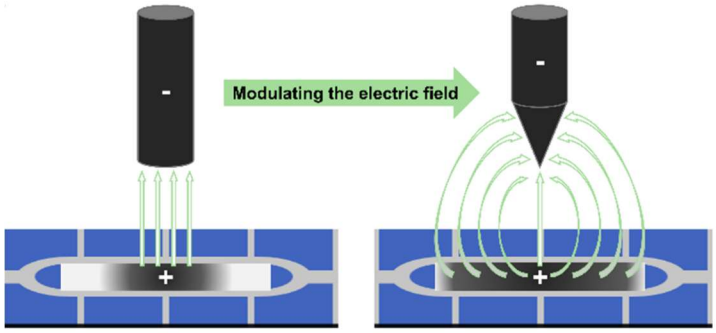


Figure 3 – A sharp cone electrode creates a wider uniform electric field compared to conventional cylinder tip

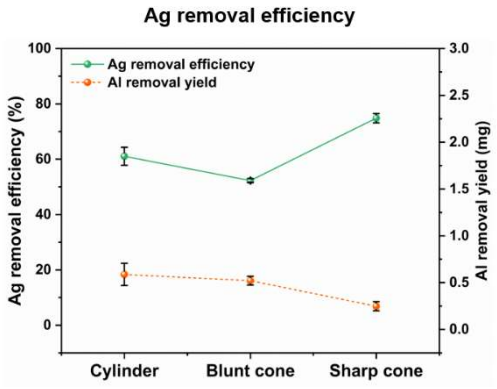


Figure 4 – Highest silver extraction (green) using sharp cone electrode

Electric charge tends to concentrate at sharp points. A sharp conical electrode tip focuses the electric field into a stronger, more intense beam, which spreads outward more effectively across the silver surface. This simple adjustment allowed researchers to control where and how silver is removed, giving them unprecedented precision in recycling solar cells. This allows the recycling process to reach silver not only directly beneath the electrode, but also across the edges and extremities of the pad — areas that flat electrodes often miss. These results confirm that reshaping electrodes into sharp cones unlocks a natural advantage, making the recycling process faster, cleaner, and more controlled.

WHY THIS MATTERS FOR THE PV SOLAR RECYCLING INDUSTRY

This breakthrough has direct commercial implications.

- Higher recovery rates: More silver recovered means higher revenue from recycling each solar panel.
- Cleaner separation: Less contamination from aluminium and silicon makes downstream refining cheaper and faster.
- Material preservation: By protecting the bond between silver and aluminium, sharp tips prevent structural damage, allowing components like wafers to be reused.
- Faster processing: Achieving high recovery in just minutes supports scalable, industrial adoption.

Given that silver accounts for nearly half the material cost of a solar cell, the ability to recover it efficiently is critical for the economics of recycling. Moreover, this process aligns perfectly with the circular economy, where valuable metals are reused rather than discarded, reducing the need for new mining and lowering environmental impacts.

CONCLUSION

This breakthrough confirms that small engineering improvements — in this case, sharpening an electrode tip — can have outsized impacts on recycling performance. By enhancing silver removal efficiency, preserving material integrity, and cutting costs, Lithium Universe's EJ recycling platform is setting new standards for the circular economy of solar energy. As global solar waste grows, solutions like this will be vital. Not only do they reduce pressure on natural resources, but they also unlock new revenue streams, proving that sustainability and profitability can go hand in hand. Lithium Universe remains committed to delivering both — advancing clean energy technologies while ensuring that the valuable materials powering the renewable future are never wasted.

WHY SILVER RECOVERY MATTERS

Silver is one of the most valuable metals in solar panels. It forms the fine conductive lines and pads that carry electricity generated by sunlight across the silicon wafer. Although each panel only contains small amounts of silver, the scale of solar deployment worldwide means that the total quantity is huge.

- Around 60–78 million tonnes of solar panel waste is expected by 2050.
- A single tonne of old solar cells contains 0.6 kilograms of silver, nearly as rich as primary silver ore mines.
- With silver prices rising and demand soaring in both electronics and renewable energy, recovering this metal is vital for both economic and sustainability reasons.

Traditional recycling methods often struggle with silver recovery. Conventional acid leaching and bath electrolysis can take hours or even days, consume large amounts of chemicals, and often fail to extract silver evenly. Worse, they frequently damage the underlying materials, making reuse impossible.

Lithium Universe's EJ recycling technology was designed to overcome these barriers — using a high-speed jet of electrolyte and precisely engineered electrodes to selectively dissolve silver in minutes, under mild and efficient operating conditions.

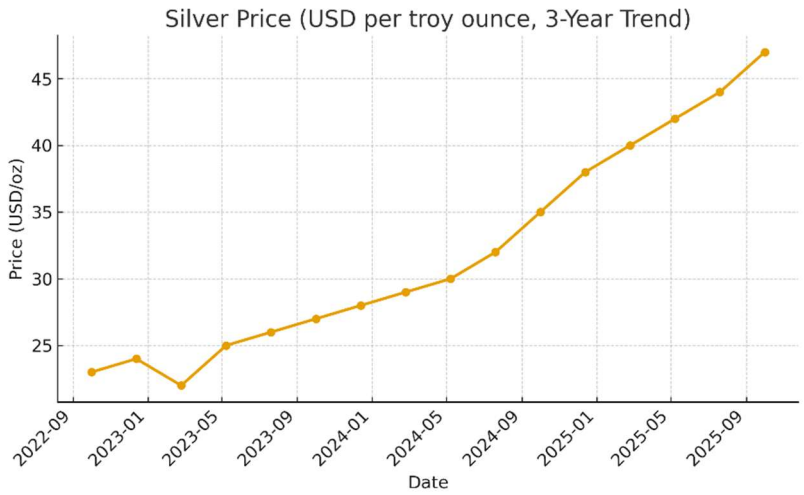
SILVER PRICE CONTINUES TO SOAR

As of early October 2025, silver is trading around USD 47.31 per troy ounce, marking a strong 48.6% year-on-year increase and a further 15.7% rise over the past month. This surge has lifted silver to its highest levels in over a decade, underscoring the growing strength of both investment and industrial demand. Over the last three years, prices have shown consistent upward momentum, with particularly sharp gains in the past 12–18 months.

Several factors are driving this rally. On the demand side, industrial use is expanding rapidly. Silver is a critical input in photovoltaic solar panels, where its conductivity makes it indispensable for busbars and electrical contacts. As global solar deployment accelerates, silver demand from this sector continues to hit record highs.

In addition, electronics, electric vehicles, and AI-driven data centres are further boosting consumption. Industrial demand in 2024 reached an all-time high of over 680 million ounces, creating a structural supply deficit. On the financial side, expectations of interest rate cuts and a weaker U.S. dollar have encouraged investors to buy silver as both a safe-haven and inflation-hedge asset. This has increased speculative and ETF holdings, amplifying the rally.

Meanwhile, supply has struggled to keep up. Mine output has been relatively flat, recycling volumes remain limited, and geopolitical disruptions in key producing regions have constrained availability. With demand consistently outstripping supply, the silver market is likely to remain tight, sustaining elevated prices in the near term.



EXECUTIVE COMMENTARY

LU7 Executive Chairman, Iggy Tan, commented:

"This achievement highlights how targeted design refinements can unlock significant performance gains. By sharpening electrode tips, our team has demonstrated a more efficient, higher-quality, and lower-cost method of recovering silver from end-of-life solar panels. This advancement further strengthens our Electro-Jet recycling technology, positioning us to make large-scale solar panel recycling both commercially viable and environmentally critical. With silver prices at record highs, our photovoltaic recycling initiative represents a true game changer, transforming discarded panels into a valuable source of precious metal. The recently identified site in Brownsville, Texas, forms a cornerstone of this strategy. We are proud to be leading the charge in converting solar waste into a sustainable, high-value resource."

Authorised by the Chairman of Lithium Universe Limited

Lithium Universe Interactive Investor Hub

Engage with Lithium Universe directly by asking questions, watching video summaries and seeing what other shareholders have to say about this, as well as past announcements, at our Investor Hub https://investorhub.lithiumuniverse.com/

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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 resources 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) 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. The company is dedicated to securing the future of green energy by addressing two major strategic initiatives: the development of a green, battery-grade lithium carbonate refinery in Québec, Canada, and pioneering the recycling of valuable metals, including silver, from discarded solar panels.

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 building 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 Chairman 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.

PV Solar Panel Recycling Strategy: Silver Extraction

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. 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.

Recent laboratory trials confirmed JESE's exceptional efficiency, achieving more than 95% in 30 minutes, under mild conditions of 5 V and dilute nitric acid Crucially, the process preserves intact silicon wafers, creating secondary value streams for reuse in solar-grade or nano-silicon applications. Equally significant, JESE has demonstrated high-purity silver recovery. Tests yielded 95.95% silver purity within five minutes—comparable to Britannia-grade silver, a premium alloy above sterling (92.5%) and close to bullion standard (99.9%)

Impurities were limited to just 4.05%, with aluminium and oxygen as the main trace elements, far outperforming conventional bath recovery, which produced only 78.6% silver with over 21% impurities. With silver demand surging in solar and electronics, LU7's technology offers a timely, sustainable, and commercially attractive solution. Looking ahead, the Company plans to expand recovery to other critical metals, further strengthening its role in the global circular economy.

Lithium Universe is committed to ensuring that both its lithium and PV solar recycling strategies help meet the world's growing demand for clean energy, while offering a sustainable solution to the challenges of resource scarcity and waste management.