# Iondrive Advances Solar Panel Recycling Targeting Recovery of High-Purity Silver and Silicon

## Highlights

- Iondrive has launched a solar panel recycling initiative targeting recovery of high-purity silver and silicon from end-of-life photovoltaic cells.
- Silver represents nearly half the recoverable value of a solar panel despite being less than 0.1% of its mass, creating a >A$1 billion opportunity as Australia's solar waste stream is forecast to surpass 100,000 tonnes annually by 2030[1].
- Feedstock for evaluation secured from commercial operators in Australia and Taiwan while commercial discussions underway with major recyclers in Germany, and the Netherlands for structured supply partnerships.
- Strong silver prices and rising silicon demand are accelerating the commercial rollout and margin potential.
- The program is expected to leverage Iondrive's DES pilot plant under construction – to fast-track scale-up and commercialisation and build a circular, low-emission recovery platform for critical materials.



**Iondrive Limited (ASX: ION) ("Iondrive" or "the Company")** has commenced development work on recycling end-of-life solar panels in partnership with the University of Adelaide and a commercial laboratory (UK). The program focuses on separating and recovering high-purity silver and silicon from photovoltaic cells using Iondrive's proprietary Deep Eutectic Solvent (DES) technology. This separation step addresses a major technical challenge in the current recycling market, enabling the silicon to be purified to ultra-high grades. End-of-life solar panels currently carry disposal/recycling costs of roughly $500–$1,000 per tonne in Australia (with landfill charges often >$400 per tonne)[1]. The recovered silicon can then be upgraded from metallurgical-grade material (typically $1,500–$4,600 per tonne) to solar-grade silicon ($15,000–$46,000 per tonne) or even electronic-grade silicon used in advanced battery anodes, semiconductor wafers, and next-generation solar manufacturing ($77,000–$308,000 per tonne)[2].

Iondrive Limited CEO Dr Ebbe Dommisse commented:

*"The recycling of end-of-life solar panels has long faced a fundamental market gap — traditional processes cannot efficiently recover and separate high-grade silver and silicon, meaning much of the value is either lost or downcycled. With silver prices at historically strong levels and demand for high-purity silicon rising in advanced applications, this represents both an economic and strategic opportunity. We believe Iondrive's DES technology is uniquely positioned to close this gap by delivering efficient, scalable recovery of high-grade materials that the market urgently needs."*

[1] https://www.unsw.edu.au/newsroom/news/2024/03/Bigger-better-solar-panel-recycling-centres-needed-deal-PV-waste-report

[2] https://silicon-powders.com/article/metallurgical-vs-solar-vs-electronic-grade-silicon-comparison - USD per Kilogram converted to AUD at an approximate exchange rate of 0.65 and expressed on a per tonne basis

## Development Programs

The solar recycling initiative is being advanced under two commercial programs:

- Commercial laboratory (UK): Stage 1 desktop work has been completed, with Stage 2 laboratory screening and an updated techno-economic analysis scheduled for completion at the end of November 2025.
- University of Adelaide: Development work using Iondrive's DES formulations is on track, with Stage 1 completion expected in quarter ending March 2026.

Both programs are structured as fast-track pathways to commercialisation, designed to leverage Iondrive's existing up-scaling expertise and facilities. There is also potential to leverage Iondrive's DES pilot plant under construction.

## Feedstock and Market Positioning

Feedstock for evaluation has been secured from commercial operators in Australia and Taiwan while commercial discussions are underway with major recyclers in Germany, and in the Netherlands for structured supply partnerships.

The recovery of silver and silicon represents one of the most significant gaps in solar panel recycling. Conventional processes typically focus on bulk materials such as aluminium and glass, while valuable silver and silicon are either lost or recovered in low-purity form[1]. Iondrive's DES platform is designed to address this gap by delivering high-grade outputs suitable for premium markets, including battery anodes and semiconductors.

Australia is one of the fastest-growing markets for solar panel deployment, with more than 120 million panels already installed nationwide. This translates to an estimated 100,000 tonnes of panels reaching end-of-life each year by 2030, representing a recoverable materials market worth over $1 billion in silver, silicon, aluminium, and glass. Despite this scale, recycling infrastructure remains underdeveloped, and most panels are currently landfilled or exported for low-value material recovery[1].

Conventional recycling approaches, such as thermal delamination and acid leaching, face several challenges:

- Energy intensity: High-temperature processes (>500 °C) destroy valuable silicon and silver, leaving only bulk glass and aluminium recoverable.
- Chemical waste and cost: Acidic leaching methods generate large volumes of waste effluent, increasing treatment costs and environmental footprint.
- Low material purity: Recovered silver and silicon are typically downcycled into low-grade applications, offering limited economic incentive for recyclers.

Iondrive's DES technology has the potential to directly address these challenges. Operating at low temperature and near-neutral pH, the process targets the selective extraction and separation of high-purity silver and silicon from photovoltaic cells. The closed-loop chemistry eliminates secondary waste streams and allows reagent recycling, significantly improving both environmental performance and process economics. This approach positions Iondrive as an early-mover in high-value solar panel recycling, complementing its existing DES platform for batteries and establishing a scalable pathway for urban-mining applications across multiple waste streams.

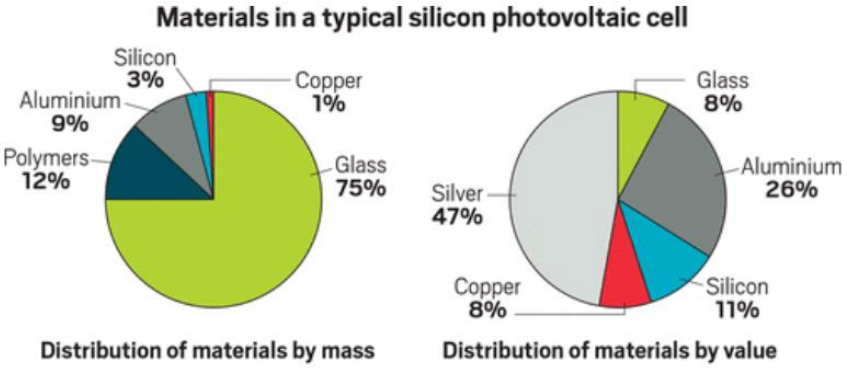


***Figure 1:*** *Materials in a typical silicon photovoltaic cell — glass dominates by mass, but silver and silicon account for most of the value.*[3]

With silver prices currently strong and global demand for high-purity silicon increasing, Iondrive's solar recycling development has significant potential to unlock new revenue opportunities while supporting a sustainable circular economy.

## Further Information

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## About Iondrive

Iondrive is developing an innovative metal extraction process using Deep Eutectic Solvent technology (DES). Its initial business case is focussed on battery recycling where the proprietary method is designed to efficiently recover critical metals, including nickel, cobalt, lithium, and manganese, from black mass in a closed-loop, environmentally friendly process. Unlike conventional hydrometallurgical and pyrometallurgical approaches, Iondrive's DES technology operates at lower temperatures, eliminates the need for aggressive acids, and offers a tuneable chemistry that can selectively extract individual metals. Whilst progressing the battery recycling application for its DES technology, Iondrive is actively seeking to expand the commercialisation opportunities into other markets, including mineral processing and Urban mining of e-waste.



[3] https://pubs.acs.org/doi/10.1021/acscentsci.2c00214