

CMSP's ReLAB Initiative Demonstrates the Potential of Second-Life Batteries in Twente

OVERIJSEL, OVERIJSEL, NETHERLANDS, November 21, 2025 /EINPresswire.com/ -- The Circular Manufacturing Systems Programmer (CMSP), managed by the Fraunhofer Innovation Platform for Advanced Manufacturing at the University of Twente (FIP-AM@UT) and funded through the Twente RegioDeal by the Province of Overijssel and the Ministry of Economic Affairs and Climate Policy (EZK), is helping regional companies adopt more circular and resource-efficient production methods. One of its industrial use-cases, ReLAB, has now shown that many lead-acid batteries (LABs) currently sent for recycling can be tested, restored and safely reused, reducing waste and lowering environmental impact.

LABs are widely used in vehicles, industry and stationary storage. Although their materials can be recycled at high rates, many batteries entering recycling streams still have usable capacity. Common ageing effects such as soft sulphation or electrolyte imbalance are often reversible. As a result, a large number of batteries are smelted prematurely, leading to avoidable material losses and unnecessary CO₂ emissions from producing new units.

ReLAB addresses this challenge by developing a practical, step-by-step workflow to determine which batteries can be reused and which can be reconditioned. The workflow uses straightforward diagnostic checks, including voltage measurements, internal-resistance assessments and controlled discharge tests to estimate remaining capacity. Based on these results, batteries are categorised for reuse, refurbishment or recycling.

For batteries that can be restored, ReLAB applies targeted reconditioning measures. These include controlled charging to dissolve sulphate build-up, balancing or refreshing the electrolyte and cycling procedures that stabilize cell performance. These steps help recover usable capacity and prepare the batteries for safe redeployment.

To validate the approach in real-world conditions, ReLAB integrated refurbished batteries into several demonstrators. These included solar-energy buffering at the Advanced Manufacturing Centre at the University of Twente, an uninterruptible power supply for equipment in the facility and an off-grid tiny-house installation. In all cases, the reconditioned batteries delivered stable performance with efficiencies above 80% under practical load profiles. Industrial-scale testing reinforced the opportunity. In a 43-tonne batch of used batteries, roughly half showed potential for reuse or refurbishment, representing several hundred kilowatt-hours of recoverable storage capacity that would otherwise have been lost to recycling.

The environmental benefits are significant. Substituting reconditioned batteries for new ones can reduce CO₂ emissions by an estimated 12% to 18% per module due to avoided smelting, lower raw-material usage and reduced transport and processing of hazardous materials. These gains support CMSP's broader aim of enabling circular, efficient and future-ready manufacturing practices.

By demonstrating a reliable method for extending the service life of used LABs, ReLAB highlights a promising pathway for cost-effective energy storage, reduced waste streams and more resilient local manufacturing systems. The approach offers a practical model for integrating circular engineering solutions into industrial practice.

About CMSP

The Circular Manufacturing Systems Programme (CMSP) is part of the Twente Regio Deal and is funded by the Province of Overijssel and the Ministry of Economic Affairs and Climate Policy (EZK). The programme supports regional companies in moving towards cleaner, smarter and more resource-efficient manufacturing. Its main goal is to accelerate the transition to circular production by developing practical use-cases with industry partners. These use-cases demonstrate how materials can stay in the loop longer, how waste can be reduced and how companies can adopt more flexible and sustainable manufacturing solutions.

Azlina azman

Fraunhofer Innovation

[email us here](#)

Visit us on social media:

[LinkedIn](#)

[Instagram](#)

[Facebook](#)

This press release can be viewed online at: <https://www.einpresswire.com/article/869311046>

EIN Presswire's priority is source transparency. We do not allow opaque clients, and our editors try to be careful about weeding out false and misleading content. As a user, if you see something we have missed, please do bring it to our attention. Your help is welcome. EIN Presswire, Everyone's Internet News Presswire™, tries to define some of the boundaries that are reasonable in today's world. Please see our Editorial Guidelines for more information.

© 1995-2025 Newsmatics Inc. All Right Reserved.