A project led by the University of Birmingham, including seven other academic institutions and 14 industrial partners, will determine the ways in which spent lithium batteries can be recycled.

With the aim to recycle 100% of the battery, the project will look how to reuse the batteries and their materials, to make better use of global resources, and ultimately increase the impact of batteries in improving air quality and decarbonisation. With Birmingham, university partners include the University of Leicester, Newcastle University, Cardiff University, University of Liverpool, Oxford Brookes University, University of Edinburgh, and the Science and Facilities Technology Council.

The aim of the ReLiB project is to establish the technological, economic and legal infrastructure to make the recycling of close to 100% of the materials contained in lithium ion batteries from the automotive sector possible.

The key components of the proposal are:

- a 'triage' system for used battery assessment
- fully autonomous gateway testing and robotic sorting
- an assessment of the relative engineering and economic gains for various second life applications
- the development of recycling technologies to segregate and purify the different materials into a useful form for re-use in batteries or other applications
- life cycle analysis and techno-economic assessment of each recycling route developed
- development of new business models to promote the collection and sorting of batteries
- review of the regulatory framework for battery recycling in the UK and analysis of which EU waste laws should be retained law in the UK after Brexit
- full characterization of active materials from cells near and at end of life and recycled materials recovered from used batteries, with respect to chemical composition (elemental concentration and distribution), particle size and morphology.

Introducing robotics into the waste and recycling sector, will boost productivity, stabilize the existing jobs market and could also draw jobs into the UK by providing valuable raw materials to feed in further up manufacturing supply chains. The ReLiB project will have a significant impact on the safety, economics and efficiency of battery recycling whilst minimizing the environmental impact of these processes.

**PRINCIPAL INVESTIGATOR**

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https://www.birmingham.ac.uk/schools/chemistry/people/navigation.aspx?ReferenceId=8958&Name=dr-paul-anderson

**UNIVERSITY PARTNERS**

- University of Birmingham (lead)
- Cardiff University
- Diamond Light Source
- Newcastle University
- Oxford Brookes University
- University of Edinburgh
- University of Leicester
- University of Liverpool
- And 14 industrial collaborators