

Special Issue

Second-Life Batteries: Challenges and Opportunities

Message from the Guest Editors

As large numbers of EV batteries approach the end of their first service life, the reuse of retired batteries in less demanding applications has attracted increasing attention. Second-life batteries offer significant opportunities for reducing lifecycle cost, improving resource utilisation and supporting sustainable energy development. However, their large-scale deployment also faces many technical, economic and regulatory challenges. Compared with new batteries, second-life batteries often exhibit substantial heterogeneity in state of health, degradation behaviour, safety risk and remaining useful life, which makes accurate evaluation, sorting, repurposing and management more difficult. Advanced diagnostic methods, battery management systems, safety assessment approaches and techno-economic analyses are therefore essential to enable reliable and cost-effective second-life applications. This Special Issue aims to present the latest research advances in second-life batteries, covering battery health assessment, screening and sorting, safety management, repurposing strategies, system integration and real-world applications.

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