

## Environmental Research, Technology Demonstration and Conference Project

<b>ECF Project:</b>	ECF 2021-108
<b>Project Title:</b>	Intelligent monitoring and diagnosis platform for second-life battery energy storage systems based on artificial intelligence and internet of things technologies
<b>Principal Investigator:</b>	Dr Wang Minghao, Department of Electrical Engineering, The Hong Kong Polytechnic University. With effect from 1 September 2023, replaced by Professor Xu Zhao, Department of Electrical Engineering, The Hong Kong Polytechnic University.
<b>Total Approved Grant:</b>	\$499,000 (ECF & WWGF: 50/50)
<b>Duration:</b>	1/1/2023 to 31/12/2025
<b>Project Status/Remarks:</b>	On-going
<b>Project Scope:</b>	<p>The “Hong Kong Roadmap on Popularisation of Electric Vehicles (EVs)” was announced to target zero-carbon emission of vehicles before 2050. The prevailing application of EVs raises the concern of increasing retired automotive batteries. The resultant battery wastes will inevitably poison the environment without appropriate treatments. Fortunately, the retired automotive batteries can be ideal second-life energy storages for buffering the intermittent renewable energy generation, which benefits the recycling of batteries and facilitates the high renewables integration. However, the retired batteries of uncertain degradation and diversified ageing degrees will lead to potential failures and fire hazards, threatening the safety and reliability of the second-life battery energy storage systems (BESS) in metropolitan power systems.</p> <p>To address this issue, an intelligent monitoring and diagnosis platform will be developed in this project for the preventive maintenance of second-life BESS. In this platform, the internet of things (IoT) technology is applied to achieve the non-interruptive perception of battery physical states. An online artificial intelligence (AI) based diagnosis algorithm, which employs deep learning technologies to analyse battery operating data, will be developed for diagnosing potential faults and arranging the preventive replacement of the worn-out batteries. The outcomes will provide an AI-based non-interruptive solution for achieving safe and reliable management of the second-life BESS.</p>
<b>Summary of the Findings/Outcomes:</b>	To be available upon completion of the project