

## Environmental Research, Technology Demonstration and Conference Project

<b>ECF Project:</b>	ECF 2021-56
<b>Project Title:</b>	Development of intelligent energy storage station using second-life electric vehicle batteries
<b>Principal Investigator:</b>	Dr Liu Chunhua, School of Energy and Environment, City University of Hong Kong
<b>Total Approved Grant:</b>	\$715,520
<b>Duration:</b>	1/8/2022 to 31/7/2024
<b>Project Status/Remarks:</b>	On-going
<b>Project Scope:</b>	<p>With the increasing popularity of electric vehicles (EVs) in Hong Kong, the number of scrapped EV batteries is increasing. However, the scrapped batteries are still with around 80% state of health (SOH). In order to prevent environmental pollution and waste of resources, this project will study the construction of an intelligent energy storage station with second-life EV batteries. The main purposes of the projects include –</p> <ol style="list-style-type: none"> <li>(1). To develop battery packs for energy storage station with second-life EV batteries. The unpacking and re-packing method of second-life EV batteries will be proposed. Also, the related battery management will be studied to balance battery units in a battery pack;</li> <li>(2). To develop highly integrated bidirectional intelligent power converters for the proposed energy storage station. The modular converter and its robust control algorithms will be designed to achieve both charging and discharging; and</li> <li>(3). To develop stable and economic scheduling scheme for battery-to-grid operation. A dynamic and distributed virtual inertia control for battery packs in the energy storage station will be designed to improve the frequency stability. A comprehensive optimization model will achieve the economic scheduling of the energy storage station in battery-to-grid operation.</li> </ol>
<b>Summary of the Findings/Outcomes:</b>	To be available upon completion of the project