

Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2021-110
Project Title:	Developing high power electric vehicle (EV) chargers using waste graphite and separators derived from end-of-life EV batteries
Principal Investigator:	Dr Xu Zhenglong, Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University
Total Approved Grant:	\$464,400 (ECF & WWGF: 50/50)
Duration:	1/9/2022 to 31/8/2024
Project Status/Remarks:	On-going
Project Scope:	<p>The Chief Executive announced in 2020 that Hong Kong will strive for carbon neutrality before 2050 and stop fuel-propelled car registration before 2035. To achieve these goals, the popularisation of ‘zero-carbon-emission’ electric vehicles (EVs) becomes a vital measure. However, this policy faces two challenges: (i) the insufficient EV chargers especially in old buildings designed with low power supply, (ii) the increasing volumes of end-of-life EV battery waste. Although cathode materials in spent batteries are pyro-/hydro- metallurgically recovered, these routes involve high energy consumption, secondary pollution and graphite/plastic wastes.</p> <p>This project aims to solve above two problems simultaneously by building high-power dual-ion batteries (DIBs) as EV chargers using discarded graphite and separators. In detail, the project team will (i) develop electrolysis method to accrue used graphite and separators from spent batteries, (ii) construct high-power DIBs for EV charging using recovered materials and novel electrolytes. Successful implementation of this project will bring two-folds benefits: pushing forward the wide use of EV green transportation by increasing the number of EV chargers and alleviating the burden of battery waste on the valuable landfill space through the sustainable battery recycling technology.</p>
Summary of the Findings/Outcomes:	To be available upon completion of the project