Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2021-36
Project Title:	Development of a new nanocrystalline alloy WPT4 high energy-efficiency wireless charger for electric vehicle
Principal Investigator:	Dr Jiang Chaoqiang, Department of Electrical Engineering, City University of Hong Kong
Total Approved Grant:	$478,000
Duration:	1/6/2022 to 31/5/2024
Project Status/Remarks:	On-going
Project Scope:	The decarbonisation and new revolution of road transport through the use of ultra-low emission vehicles, including electric vehicles (EVs), is seen as critical green transport to help Hong Kong achieve its climate change obligations and to improve air quality. Aiming to provide full autonomy, no tethered electrical outlet, and no contact hazards, many EV manufacturers including Tesla, BMW, Porsche, Toyota, and SAIC Motor, are endeavoring to the wireless EV charging pilot program. The goal of this project is to develop a practical prototype of a new Nanocrystalline 22kW-WPT4 high energy-efficiency inductive power transfer (IPT) charging system for the next-generation wireless EV charger, where the new laminated Nanocrystalline alloy (FeCuNbSiB) ribbon cores and multiple parallel dual-active SiC converters will be developed and built to improve magnetic saturation, reduce the core losses, enhance the power density, and improve the system flexibility and feasibility. The success of the project will provide sound knowledge for the design of the next-generation IPT system for advanced modern EVs, as well as the promotion of the utilization of EV as a green transport. As a result, more EV users are being attracted and the process of Hong Kong's future direction to attain zero vehicular emissions before 2050 is being accelerated.
Summary of the Findings/Outcomes:	To be available upon completion of the project