Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2021-88
Project Title:	Green conversion of microalgal biomass into high value products
Principal Investigator:	Dr Yung Ka Fu, Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University
Total Approved Grant:	$498,000
Duration:	1/9/2022 to 31/8/2024
Project Status/Remarks:	On-going
Project Scope:	A technologically viable platform for green conversion of naturally available microalgal biomass into products with high value is proposed. A series of heterogenous catalysts has been developed to unlock the valuable raw materials in microalgal cell through a carefully designed process into various products namely biodiesel, bio-based plastic and protein rich animal feed. The project team designed a series of metal-oxide-based catalyst that can precisely catalyse the transformation of different oxygen functional groups without strong acid or base at mild conditions. The proposed platform aims solve the problems encountered by the biomass related industry including high cost for dewatering, energy, complex purification process and waste treatment which hamper the massive commercialisation of such technology. With the newly developed catalytic processes, an energy efficient, green and simple workflow can be achieved to convert the microalgal oil, carbohydrate and protein into fuel, plastic and animal feed respectively. With the success in completing this platform, it helps to reduce the operation cost of the microalgal biomass conversion with the enhancement of profit gained. The project team hopes it facilitates a new mode of revenue generating and sustainable industry that utilises renewable resources with low carbon footprint to operate in Hong Kong.
Summary of the Findings/Outcomes:	To be available upon completion of the project