**Environmental Research, Technology Demonstration and Conference Project**

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| **ECF Project:** | ECF 2021-69 |
| **Project Title:** | Graphene oxide moisture condenser for high efficiency dehumidifiers |
| **Principal Investigator:** | Dr Ly Thuc Hue, Chemistry Department, City University of Hong Kong |
| **Total Approved Grant:** | $500,000 |
| **Duration:** | 1/6/2022 to 31/5/2024 |
| **Project Status/Remarks:** | On-going |
| **Project Scope:** | This project aims to innovate the design of moisture condensers in air dehumidifiers, targeting the greatly enhanced energy efficiency. Prevailing high humidity weather in Hong Kong causes many problems in human health, housing, materials degradation and environment pollutions. Thus, the commercial and consumer-level dehumidifiers are extremely popular and necessary in Hong Kong. However, the heat generated by compressors and low energy efficiency in dehumidifiers bring additional questions for current dehumidifiers. Here we propose to apply the innovated graphene oxide (GO) surfaces, which can modulate the hydrophilic and hydrophobic nature of surfaces, in order to promote the water droplet nucleation and water droplet mobility simultaneously. The new GO drop-wise condenser will be used for saving over 50% energy consumption for harvesting same amount of moisture or water in air, and capturing more than 200% moisture or water in air at the same power. This project will lead the substantial innovations in water condensing systems which are traditionally metals and ceramics. |
| **Summary of the Findings/Outcomes:** | To be available upon completion of the project |