

## Environmental Research, Technology Demonstration and Conference Project

<b>ECF Project:</b>	ECF 2018-53
<b>Project Title:</b>	Demonstration of high performance thermal energy storage technology using novel phase change nano-emulsion for energy conservation
<b>Principal Investigator:</b>	Professor Wu Jian Yong, Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University
<b>Total Approved Grant:</b>	\$1,770,400 (ECF & WWGF: 50/50)
<b>Duration:</b>	1/9/2019 to 31/5/2022
<b>Project Status/Remarks:</b>	On-going
<b>Project Scope:</b>	<p>This project aims at the optimisation and application of novel phase-change material (PCM) for high-performance thermal energy storage (TES) in the cooling systems of buildings and data centers. The novel PCM is the PCM/water nano-emulsion, which has been derived from the project team's previous research projects. This novel PCM/water nano-emulsion is promising for efficient storage of thermal energy in the form of latent heat, and for industrial production and commercial application. The PCM/water nano-emulsion is a dispersion of nano-sized PCM droplets in water with the aid of emulsifiers. It has significant advantages over the conventional energy storage media for TES to maximise the reuse of thermal energy. As a fluidphase material, the nano-PCM emulsion can achieve more efficient heat transfer between the PCM droplets and the ambient fluid because of the smaller size and larger specific surface area. It can be reused for many heating-cooling cycles, retaining a much longer service life than other thermal storage materials. With these advantages plus the low fluid viscosity, this water nano-emulsion can be a high performance PCM for TES systems. This project will demonstrate its applicability and performance for energy conservation.</p>
<b>Summary of the Findings/Outcomes:</b>	To be available upon completion of the project