

Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2022-35
Project Title:	Environment and Conservation Fund - A Feasibility Study on Various Types of High-Efficiency Chillers in Hong Kong: A Life-Cycle Assessment
Principal Investigator:	Professor Chao Christopher Yu Hang, Department of Building Environment and Energy Engineering, The Hong Kong Polytechnic University
Total Approved Grant:	\$1,000,000
Duration:	1/7/2023 to 30/6/2025
Project Status/Remarks:	On-going
Project Scope:	<p>Almost all buildings in Hong Kong are equipped with air-conditioning systems. Commercial buildings, especially high-rise office buildings, hospitals and hotels, require substantial space cooling due to their usage and operation nature. However, many of the central cooling systems are now operated inefficiently. Some building owners purchase low-efficiency chillers because they are cheaper. Some purchase expensive advanced high-efficiency chillers, but the chillers cannot perform as claimed. This poses a great challenge to Hong Kong in reducing the electricity consumption of commercial buildings by 30%-40% and achieving overall carbon neutrality by 2050. This project will disclose the best possible efficiencies of the high-efficiency chillers and how they could be achieved in commercial buildings in Hong Kong. The feasibility of adopting high-efficiency chillers that are currently commencing and under development with different control strategies for commercial buildings in Hong Kong will be studied. Their saving potentials in aspects of energy, cost and carbon emissions will be evaluated through simulation modelling. Besides, the applicability of renovating existing chiller plants will be discussed to enlighten the saving potential of existing commercial buildings. This project will shed light on the suitable chiller plant for commercial buildings and take a great leap in achieving carbon neutrality.</p>
Summary of the Findings/ Outcomes:	To be available upon completion of the project