

Application potential of solar thermal technologies for buildings in Hong Kong

Square K. F. Fong, T. T. Chow, John Z. Lin, Apple L.S. Chan
Building Energy and Environmental Technology Research Unit
Division of Building Science and Technology, City University of Hong Kong

Abstract

Among a variety of renewable energy, solar energy is the most feasible option for wide applications in Hong Kong. In the context of sustainable building design, there are growing interests in the photovoltaic installation and system advancement in the recent years. The photovoltaic/thermal solar collector is also proven effective in building use. Solar heating exists in Hong Kong, but mainly limited to sparse domestic use and government projects. In the light of the building integrated approach, it is also techno-economically viable for wide application of solar water heating for the high-rise residential buildings in Hong Kong. In addition, the application potential of solar cooling such as the desiccant cooling, absorption or adsorption refrigeration is applicable based on the local sub-tropical conditions. Simulation-optimization is a useful mean in determining the design parameters of these solar thermal systems, so that the optimal thermal gain and energy saving can be achieved for the sustainable building design.

Keywords: Solar water heating, solar cooling, simulation-optimization, renewable energy