

SPD5152 Industry-Based Student Project

<http://ibse.hk/SPD5152/>

Proposed Topics (2016-2017)

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Title:	Design of solar energy powered street lamps in Hong Kong
Description:	Street lamps, especially in remote area, require long electrical cables and central control systems, consuming the fossil energy. Nowadays, the cost of solar panels, which could directly convert the sunlight into electricity, is substantially reduced. The solar panels could be easily integrated into the individual street lamps, reducing the emission of greenhouse effect gases and lowering the requirements of electrical cables and the central control system. In this project, study on the solar irradiation in Hong Kong will be conducted first, followed by study on the construction of solar energy powered street lamps. Then design of the system will be carried out and a demonstrative model will be presented.

Title:	Study of energy efficiency for class rooms by using heat-isolation window glasses
Description:	Hong Kong is located in the tropical zone with a high average temperature above 30°C during summer days. Air conditioning systems are used to cool down the temperature inside rooms, consisting of the main energy consumption of utility grid. It is well known that the rise in temperature inside rooms is predominantly produced by the high intensity of long wavelength sunlight irradiation into the room through windows. By using the heat-isolation glasses for windows, most of the long wavelength sunlight will be blocked, lowering the temperature in rooms. In this project, a model will be set up, to simulate the heat transfer while applying heat-isolation glasses, as well as the energy efficiency. Eventually a solution to the energy saving in class rooms will be proposed, based on the application of heat-isolation glasses and the simulated results.

Title:	The feasible study on the application of transparent photovoltaic integrated glass in buildings with large area glass curtain walls
Description:	The photovoltaic devices could be tailored in various forms. For example, they are arrayed with large space between each other, and then sandwiched by two transparent glasses, forming transparent (or semi-transparent) photovoltaic integrated glasses. When these

	<p>photovoltaic integrated glasses (PIGs) are used in buildings with large area glass curtain walls, on one hand, these PIGs will produce electricity under sunlight irradiation, powering the lamps or other electrical equipment in rooms. On the other hand, these PIGs could still let a certain amount of sunlight go through the glass curtain walls, providing the natural light into the rooms. In addition, the architecture aesthetics will be enhanced. In this project, studies on the light management by controlling the percentage of incident sunlight, and the system design of the transparent photovoltaic devices will be conducted. And a demonstrative model will be presented.</p>
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