

SBEnc ARC HUB IH150100006 Project

Closing the gap between design and reality of energy retrofitted buildings

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The disparity found between the predicted energy consumption in the design stage of buildings and the actual energy use during operation is known as the energy performance gap. According to recent studies, the actual energy consumption can be up to 2.5 times higher than the predicted. Inaccurate prediction of energy savings can cause significant financial loss to the clients and investors because in a retrofitting project the installation cost of the retrofit measures is repaid from energy savings. The performance gap may arise due to various reasons during the project's lifecycle. These may include issues at the design stage such as faulty design assumptions or simplification in design, errors related to the construction and commissioning works, and problems occurring in the operation stage such as inefficient operational practices.

Objectives

This project aims to develop a methodology that will help to minimise the performance gap that may arise from design, construction and operational stages in buildings. The objectives are:

1. Investigate the factors that contribute to the energy performance gap
2. Develop strategies to reduce the impact of these factors and minimise the performance gap
3. Develop a framework for the designers, contractors and building operation staff to follow to minimise the performance gap

Industry Outcomes

The expected outcomes include a list of influencing factors, a relevant improvement strategy and frameworks that will help the designers and contractors to minimise the performance gap. This will also help facility managers to attain optimum operational efficiency. Other potential impacts include:

1. increased confidence in energy efficient building designs leading to greater investment and creation of new business opportunities and jobs in the retrofitting industry
2. savings in public funds from ineffective retrofit schemes
3. improvements in thermal comfort, productivity and employee satisfaction in office buildings
4. reduction in national energy consumption and carbon emissions



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