Characterisation of the Multidimensional Performance Risks Associated with Building Energy Retrofits

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Form of Presantation

- ○ Poster
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Short Description (maximum 2500 characters)

The potential contribution of the built environment to reducing the carbon intensity of the economy has been well established. The EU Energy Efficiency Action Plan 2011 posits that the built environment offers greater potential savings than any other area of activity, given that buildings account for nearly 40% of final energy consumption.

Considering both public policy objectives and those of building owners, there are three broad strands of performance metrics that may be applied to building energy retrofits, viz. energy savings, financial return and reduction of carbon emissions. Best practice requires consideration of these metrics on a whole life basis using approaches derived from methodologies such as life cycle cost analysis LCCA, and life cycle assessment LCA.

However, to address each of the identified performance strands - energy, finance and carbon - in a satisfactory manner, the building energy retrofit industry needs to acknowledge and address a number of distinct types of performance risk. This paper contributes to the required discussion by examining conventional approaches to measuring performance of building energy retrofits and by identifying and exploring a number of associated but distinct performance risks, including:
• Technological - chosen solution may not work as promised, resulting in diminished returns in each of the performance strands;
• Technical - commissioning of the solution may not be of sufficient quality to achieve predicted energy savings or may take such additional time and resources as to affect the lifecycle performance in each strand;
• Longevity - the solution's durability may be less than planned, thereby detrimentally affecting each of the performance strands;
• Human factor - the solution may not be used correctly or optimally by users resulting in reduced performance in each strand;
• Maintenance - the degree of upkeep required for the solution to achieve the required

performance may be greater than anticipated affecting the finance and carbon performance strands;
• Energy cost - the cost of energy may move contrary to the assumptions used in decision-making, affecting the finance performance strand;
• Decommissioning risk - the envisaged end of life management of the chosen technology may prove not feasible, affecting finance and carbon performance;
• Decarbonisation - the energy saved, i.e. avoided consumption, may have reduced carbon intensity, affecting the carbon performance strand.