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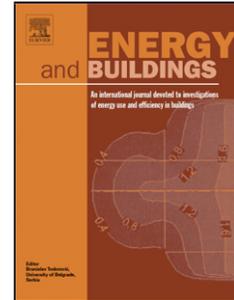
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Are passive houses economically viable? A reality-based, subjectivist approach to cost-benefit analyses.

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Abstract

The 'passive house' (PH) is a specific, pan-nationally recognised building standard designed to consume 15 kilowatt-hours of space heating energy per square metre of living area per year (kWh/m²a), significantly less than most countries' current standard for a conventional house (CH). Most PHs cost some 5-15% more to build than a CH of equivalent size and layout. Investor-households therefore often enquire as to whether building a PH is economically viable: will the extra cost pay back in the long-run through fuel savings? A number of studies have offered cost-benefit analyses to address this, usually based on modelled heating consumption figures and prescriptive approaches to setting values for unknowable variables such as future fuel price rises and the investor's discount rate. This study offers a novel 'reality-based, subjectivist' approach. It uses empirically derived (i.e. real rather than modelled) consumption figures for PHs and CHs, and allows flexibility in setting fuel price increase and discount rates according to investor-households' subjective judgments. Drawing on a wide range of data from peer-reviewed and non-peer-reviewed studies, it presents sample results in terms of years to amortisation against PH-CH consumption differences, and offers an 11-point decision-making process for would-be investor-households.

Keywords:

Passive house; cost-benefit analysis; low-energy housing; consumer energy behaviour; discount rate

1. Introduction

This paper develops a 'reality-based', 'subjectivist' approach to deciding whether it is economically viable to build a passive house rather than a conventional house. It is 'reality-based' in that it uses the particular investor-household's likely *actual* heating

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