Sustainable thermal technologies and care homes: Productive alignment or risky investment?

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HIGHLIGHTS

- Care homes for older people might be particularly appropriate for the use of sustainable thermal technologies.
- We examine if a productive alignment between care homes and the use of sustainable thermal technologies does exist in practice.
- Two key themes are risks to business reputation; and relevance and potential benefits to care practices.
- We conclude that the sector could remain rather reluctant to embrace sustainability innovation.

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ABSTRACT

The use of more sustainable thermal technologies is a policy imperative across the UK building stock. However, not all building uses provide the same opportunities for technology uptake as others. Care homes for older people have characteristics which in technical and economic terms suggest that they might be particularly appropriate for the implementation of more sustainable thermal technologies. They have comparatively high demands for space heating and hot water often sustained on a 24/7 basis. However there are many considerations, both generic and contextual, that will typically play into processes of technology uptake. Through qualitative research in six case study homes, focused on management and staff perspectives and experiences, we explore the degree to which there might be a productive alignment between care home operation and the use of sustainable thermal technologies. Two key themes emerge focused on business considerations and the importance of avoiding risk and damage to reputation; and the ways in which different thermal technologies are relevant to and can potentially impact on care practices. We conclude that despite potential benefits the sector could remain rather resistant to sustainability innovations. We suggest therefore areas in which productive action and further research could be undertaken.

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1. Introduction

There is much impetus for the installation and use of more sustainable thermal technologies within the UK building stock, ranging across forms of energy efficiency, heat delivery and heat generation technologies. Energy for space heating is by far the most significant usage within buildings and is the specific focus of the recent UK government heat strategy (DECC, 2013). However, not all building uses and forms provide the same opportunities or conditions for the uptake of sustainable thermal technologies and

a differentiated analysis is therefore needed of what is likely to promote and constrain their diffusion into different sectors and settings. In this paper we focus on care homes as a particular category or sector of the building stock. Care homes[1] provide the living spaces for approximately 400,000 older people in the UK, across over 18,000 care home units (Owen and Meyer, 2012). Given projected increases in the over-65 population, care home sector provision will need to increase substantially in the absence of changes to the current housing situation (Department of Communities and Local Government, 2008).

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[1] Both residential and nursing homes were part of our sample. We thus use the term 'care homes' to cover both types of institution.

We are interested in care homes because of these on-going dynamics, but also because at face value they have characteristics which suggest that they might be particularly appropriate for the implementation of more efficient and effective thermal technologies. A recent report has estimated that the energy use in UK care homes accounts for around £468.5 million in utility costs and around 2.3 million tonnes of CO_2 equivalent (NEP Energy Services, 2012). From case studies of four homes the report estimates that an average 11% cut in energy use could be achieved (equivalent to 220,000 t of carbon per year) with a range of technology options prioritised including energy efficiency measures, the installation and use of smart metres, ground floor heat pumps with under floor heating, combined heat and power and solar systems. Looking to such technologies makes particular sense, the authors argue, because:

'As 24/7 operations, homes are by necessity particularly energy and resource intensive. With rising costs for natural resources including energy, water, food and waste disposal, care homes are potentially more exposed to these financial pressures than other institutions' (NEP Energy Services, 2012 p16).

Whilst we would support the assessment and general conclusions of this report, and the recommendations of various strategies and design guides on housing for older people (e.g. Housing Learning and Improvement Network, 2008; Homes and Communities Agency, 2012: National Housing Federation, 2011) that see sustainability as important to new build and refurbishment processes, we argue that a more careful consideration of the complexities of innovating specifically in care home settings is needed.

In this respect care homes represent a particular form of use of indoor space with decidedly hybrid qualities. They are at once a day-to-day domestic and collective living environment for the residents and a workplace for care staff and other employees. Care homes also come in very different shapes and sizes, some in older buildings, some very new (and combinations of old and new). Some are part of large corporate chains, others are run by local authorities (although declining in number), or are individual homes run by owners/managers who live on-site (Johnson et al., 2010). Care homes are therefore both distinct in functional and organisational terms from other categories of building use, as well varied within their category. These characteristics are recognised in research reports, guidance and best practice documents related to various dimensions of care home design and operation (e.g. Torrington, 1996; Cantley and Wilson, 2012); but have not been adequately incorporated into the often rather general advocacy for sustainability to become a stronger part of care provision (Evans et al., 2010).

In this paper we therefore explore the degree to which there might be a productive alignment between care home operation and the use of sustainable thermal technologies. Through investigating the experiences and perspectives of care home owners, managers and staff, we identify what might both support but also obstruct care homes taking up new opportunities and consider the implications that follow for policy seeking to support technology adoption. In this respect we seek to add to and inform existing research focused on building design and technology application through emphasising the 'user' perspective-identifying what those involved in providing a care service see as significant and important to their decision-making and everyday practice. Research on sustainability innovation and technology diffusion has readily shown that processes of change and transition are lengthy, problematic and complex (Foxon and Pearson, 2008; Montalvo, 2008; Smith et al., 2010) and that a range of considerations – beyond only the technical and the economic – can play into the patterns of adoption that materialise and the practical experiences of those

users that take up new technology options (Biggart and Lutzenhiser, 2007; Cooremans, 2011; Hoffmann and Henn, 2008; Wrapson and Devine-Wright, 2014). Implementing sustainable innovations in an involved heterogeneous setting like a care home adds further dimensions to an already difficult process, and despite the fact that fitting new technologies in with established practices is a key factor for the appropriation of technologies (Silverstone et al., 1992) research has, as yet, not taken this on board in relation to sustainable thermal technologies in care homes.

We therefore set out to capture key elements of the practice-technology alignment through research undertaken in six care homes as part of a multi-partner project aiming to understand how thermal comfort is experienced and managed within the living spaces of older people. We do not seek to derive estimates of the total scope for cost-efficient uptake and energy saving as already provided in the NEP Energy Services Report (2012). Rather, in using a qualitative research methodology, we seek to take on board the particular contexts and experiences of different homes and the reasonings and evaluations being made by different members of the staff in these homes.

We begin by describing in more detail the research methods that have been utilised, before introducing the thermal demands and features particular to the care home setting. After this we discuss our findings across two sections. The first deals with business considerations and the importance of risk and reputation management. The second addresses the ways in which thermal technologies are relevant to and potentially benefit care practices. We conclude by considering the interrelated nature of the consequences of installing sustainable heating technologies, drawing out recommendations and discussing both the limitations of the study and the opportunities for further research.

2. Methods

As little is currently known about the types of considerations that are relevant to the introduction of sustainable technologies in care homes, we adopted an exploratory research design capable of generating a depth of insight. There was a need to capture information about the use of buildings and heating, ventilation and cooling technologies, but also to understand care routines, the meanings and expectations held by different people working in the home, and the nature of the home's organisational structure. To do this, semi-structured interviews were employed as the main source of data, alongside observation of everyday care and thermal comfort practices, in order to create as full a picture of the workings of each institution as possible.

An internet search was first used to identify potential case study care homes differentiated by criteria of size, location, age of building(s), form of ownership and types of sustainable thermal technologies. Despite our initial assumption that care homes would – in a thermal sense – be a particularly suitable building type for using sustainable thermal technologies, it proved difficult to find sufficient care homes that were obviously using these. At the time of the study there were either very few care homes that were using sustainable heating technologies, or very few that were advertising this to the outside world (a problem also experienced by Tinker et al. (2008) in their work on the remodelling of extra care housing). The care homes we could find were usually identified through the websites of designers, builders or various subcontractors, as examples of projects they had been involved in. After much searching and following of leads we arrived at a list of potential case studies and then, of those agreeing to participate in the research, recruited 6 care homes to take part in the study. This number allowed for the development of a sense of the diversity across the care home sector while enabling reasonably intensive