BENEFITS AND LIMITATIONS OF SOCIAL PRACTICE THEORY TO EVALUATE PRACTICES IN SUSTAINABLE OFFICE BUILDINGS: PRELIMINARY FINDINGS

L.M. King[1], C.A. Booth and J.E. Lamond

[1] *Construction and Property Research Centre, University of the West of England (UWE), Bristol, UK*

Despite the acknowledgement that buildings are a major consumer of natural resources, the gap between design and operational building performance continues to present a challenge to both the construction industry and building occupants. Occupant behaviour is recognised as a significant factor in understanding operational performance. Approaches rooted in psychology have typically been adopted to understand behaviour and develop interventions, with the 'individual' as the focus of analysis. Social Practice Theory (SPT) provides an alternative means of appraising the dynamics between elements which converge to form practices impacting on the operational performance of the building, moving the focus of analysis from the individual to the practice. The building features designed to support sustainable behaviour are therefore considered as material elements embedded in wider social systems and not simply as physical features designed to determine behaviour. The benefits and limitations of a social practice approach in this context are appraised through the analysis of research undertaken in BREEAM Excellent certified office buildings considering the practice of moderating comfort. Findings demonstrate that SPT provides an opportunity to contextualise the physical features of sustainable office buildings and permits a more complex analysis of 'why' and 'how' workplace routines and practices are undertaken.

Keywords: behaviour change, green buildings, social practice theory, sustainability.

INTRODUCTION

The built environment is implicated in unsustainable patterns of global resource consumption. Buildings contribute 40% of all annual energy consumption and up to 30% of all energy-related greenhouse gas emissions globally (UNEP-SBCI 2010). Non-domestic buildings are responsible for significant natural resource consumption, waste production and greenhouse gas emissions. Adaptive and mitigative measures to reduce the environmental impact of buildings, developed by both industry and policy makers, are embodied in technical and regulatory requirements at national and international level and in voluntary sustainability assessment and ratings systems.

BREEAM[2] is the most widely used sustainable building ratings system in the UK (Larsson 1998). Assessments of sustainable buildings are typically undertaken at design stage. Predictions of sustainable building performance however, often diverge

---

[1] Louise5.king@uwe.ac.uk
[2] The Building Research Establishment Environmental Assessment Method

---

significantly from the in-use performance. A growing body of literature has emerged around this issue, termed the *"performance gap"*; the discrepancy between predicted and operational building performance (Menezes *et al*. 2011). The PROBE[3] Studies undertaken in the 1990s, evaluated operational performance of 23 non-domestic buildings, concluding that, once occupied, energy use could be as much as double design stage predictions (UBT 2014). The Carbon Trust's 'Closing the Gap' report identified factors potentially contributing to building underperformance: discrepancies in design assumptions and modelling; built quality; building management and occupant behaviour (Carbon Trust 2012). Occupant behaviour has been evaluated in numerous studies.

Monfared and Sharples (2011) contend that assessments undertaken prior to occupation fail to rigorously consider the impact of end users. Occupants in sustainable buildings are typically considered in the context of monitoring behaviour or measuring satisfaction and initiatives aimed at 'managing' demand and 'changing' behaviour dominate. Such approaches are embodied in educational campaigns, social marketing, visual feedback systems, information campaigns, incentives, variable pricing schemes, technological developments, standardization and labelling (Shove 2003, Jackson 2005). The individual is the central unit of analysis in such linear attitude-intention-behaviour models which fail to robustly address social, cultural and contextual factors.

Develped in response to criticism of the individualistic approach, the systemic paradigm shifts focus from individuals to wider institutional actors such as organisations, companies and local authorities and relies on the principles of physical and environmental determinism; that desired behaviour can be achieved through the appropriate environment, infrastructure and technology in line with stringent regulation (Spaargaren, 2011). However this approach neglects consideration of individual's capabilities and the dynamics of social life. What is termed the agency-structure debate has emerged, highlighting the limitations of both the individualist and systemic paradigms. Sociological, practice-based theories offer a more balanced approach to addressing unsustainable patterns of consumption and lifestyles. Neither individualistic nor structuralist, focus is shifted from the individual to everyday practices whilst practices are considered entities, 'performed' by individuals or 'carriers' (Reckwitz 2002).

SPT provides an opportunity to reframe how occupants are analysed. Warde (2005) notes *"the principal implication of a theory of practices is that the sources of change behaviour lie in the development of practices themselves"* (140). This paper evaluates the application of SPT in understanding occupants in the specific context of sustainably designed office buildings, contributing to empirical research in this field.

Sustainable office buildings and their occupants

Heerwagen (2000) contends that office buildings are widely considered as a strategic means to achieve corporate ends. Sustainably designed offices may not only showcase the company and its 'Corporate Social Responsibility' policies, but may reduce emissions and resource consumption costs, increase productivity, health, comfort, well-being and provide a future strategic asset. Post Occupancy Evaluation (POE) is increasingly undertaken to provide a systematic review of buildings in occupation, however in the context of office occupants focus is typically limited to issues

---

[3] Post Occupancy Review of Buildings and their Engineering

impacting on productivity (Stevenson 2009). Building Use Studies (BUS) methodology, developed within the PROBE studies, has been widely applied to gather data regarding occupant satisfaction in sustainable office buildings (Sawyer *et al*. 2008, Choi *et al*. 2012, Hauge *et al*. 2011, Steemers and Manchanda, 2009). Contemporary environmental policy places responsibility on individuals through the encouragement of 'green' purchasing, waste reduction, promoting efficiency through the adoption of 'green' technology and personal sacrifice (Shove 2010:1277). However, the influence of social context must not be disregarded *"individuals do not exist in a social vacuum…in some cases the surrounding context overrides all…cognitive factors"* (Hargreaves, 2011: 81). Theories of practices address issues of how demand is constituted and changed. SPT offers an alternative to individualistic models and may provide opportunities to reduce the performance gap through an understanding of practices.

Theories of Practice

Theories of practice are grounded in the works of Bourdieu (1977) and Giddens (1984), and propose a balanced cultural theory of social action and order. Practice theories regained prominence through a second wave of practice theorists (Reckwitz 2002, Schatzki *et al*. 2002, Shove 2003, Shove 2010, Shove *et al*. 2005, Warde 2005). Whilst there is no universal 'practice theory' Schatzki (2002) notes practice theories offer a perspective which is neither individualist nor holist, encompassing interactions between knowledgeable and capable individuals and social structures, such as technology, infrastructure and institutions. Reckwitz's (2002) widely cited definition of a practice describes *"a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge."* (Reckwitz 2002: 249). Elements are interconnected and converge over time to shape practices.

Practices may be analysed as entities however in order to exist, practices must be reproduced in daily life. The role of the individual is as the 'carrier' of the practice, notwithstanding that the individual is a *"knowledgeable and capable individual"* (Schatzki 2002: 2). Practices do not exist in isolation, they are dynamic and constantly evolving (Warde 2005, Shove and Pantzar 2012). For example, technology, economic growth and historical influences impact on practices. Individuals engage in multiple intersecting and overlapping practices. It is contended that interventions based on the isolated 'unsustainable' behaviours, will have limited success as they do not consider how practices are shaped and the totality of practices individuals are engaged in (Evans *et al*. 2012).
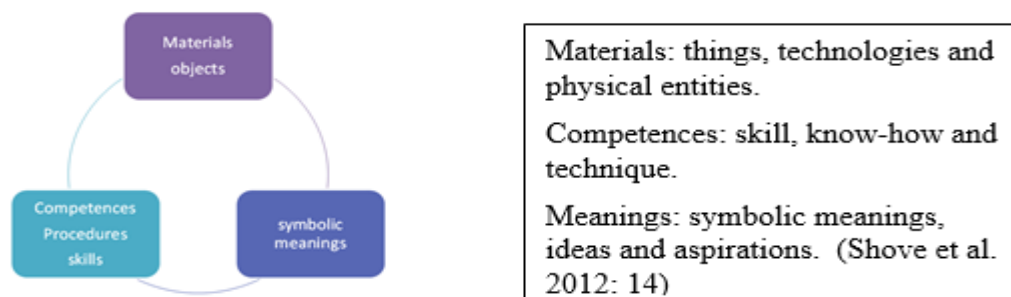

Figure 1: The Social Practice Framework

SPT has been applied to analyse diverse activities from Nordic walking (Shove and Pantzar 2005) to changes in the digitalization of music consumption (Magaudda, 2011). Criticism of the approach centres around limitations of its application to empirical data *"as general theories of practice…tend to be idealized, abstract, and insufficiently attentive to social processes involved in the creation and reproduction of practices"* (Warde 2005: 135). Analysis of practices is subjective, each theorist has *"their own unique understanding of how practices are constituted and reproduced"* (Strengers 2010: 6-7). How to undertake such analysis is also subject to wide debate amongst scholars. Reckwitz (2002) places the focus of analysis on the elements which constitute practices, Schatzki (2002) on connections between elements and Spaargaren and Van Vliet (2000) on links between practices, lifestyles and socio-technical systems of provision. Hargreaves (2011) contends that Shove and Pantzar (2005) provide an *"empirically helpful understanding of practices…that are dynamically integrated by skilled practitioners through regular and repeated performance"* (83). This approach is conceptualised in a Social Practice Framework (SPF, Figure 1) which deconstructs practices, comprising three elements: meanings; materials and competencies. This framework is adopted for analysis of initial findings in this paper.

SPT offers a perspective *"not only useful for studying stability in practices (Schatzki 2002) but also for gaining insight into how social change occurs."* (Halkier *et al* 2011: 9). This is of particular interest as moves to 'flagship' green offices are often presented as a catalyst, or in the language of practice theories 'points of disruption' to instigate a change in practices in work-related consumption routines. Focus is shifted from persuading or educating individuals to change their behaviours, to understanding the potential to render practices more sustainable. The findings which follow set out the potential of SPT for the analysis of the practice of moderating comfort within sustainable office buildings.

METHODOLOGY

Individualistic approaches often utilise self-report questionnaires, potentially subject to social desirability effects (Burgess *et al*. 2003). Shove (2003) notes that questionnaires seek to understand gaps or barriers and may imply individuals are simply awaiting 'better information' in order to make 'better' decisions. SPT however, necessitates a deeper, contextual understanding of actions in situ. A more complex understanding of daily life, as it is conducted, is required (Hargreaves, 2011).

In order to provide a more complex understanding of everyday practices in context, ethnographic research was undertaken. Ethnographic research aims to *"understand parts of the world as they are experienced and understood in the everyday lives of people who actually 'live them out'"* (Cook and Crang 1995: 4). Payne and Payne (2004) define ethnography as *"the production of highly detailed accounts of how people in a social setting lead their lives, based on systematic and long-term observation of, and conversations with, informants."* (Payne and Payne 2004:71). Ethnographic observations were undertaken at multiple case study sites, providing *"multiple measures of the same phenomenon"* (Yin 2003: 99). Three BREEAM 'Excellent' certified sustainable office buildings in England were selected as case studies (see Table 1).

Key practices were selected following a review of BREEAM Excellent criteria, reflected in the physical design of each case study building and linked to user interaction. Initial participant observations have been carried out over a 4 month

winter-spring period which will be supplemented by further observations over the following 8 months allowing seasonal variations to be taken into account. A field diary was used to record observations which were then thematically coded to identify key issues and core themes underpinned by the SPF.

This paper discusses initial findings surrounding the social practice of moderating comfort and lies within the scope of what is termed by Shove (2003) *"aspects of everyday life that are moving in increasingly resource intensive directions"* (Shove 2003: 17).

Social Practice Framework Analysis

As previously noted, the SPF is a starting point for the analysis of practices, providing a means to deconstruct a practice. Findings have been analysed in line with this structure, presenting the three elements of SPT: meanings, materials and competences.

Moderating Comfort - Meanings
Meanings in SPT are dynamic, shared understandings which *"emphasize tacit and unconscious forms of knowledge and experience through which shared ways of understanding and being in the world are established, through which purposes emerge as desirable and norms as legitimate"* (Shove *et al*. 2012: 12). In the context of sustainable office buildings, Monfared and Sharples (2011) contend that these buildings hold embedded meanings for their occupants, such as providing a 'green' solution whilst meeting conventional comfort expectations.

Findings suggested meanings associated with 'intelligent' buildings. For some respondents, across all buildings, the benefits of occupying a sustainable office were that the building would 'deal with' resource issues. The FM team were considered to be the gatekeepers of the building, with occupants powerless. One member of the FM team described the response of occupants to changing internal temperature *"the first hot day the windows opened and within 3 minutes I had HR on the phone 'we're freezing. We've all got our jackets on.'"* (Building A, FM team, female).

Perceptions surrounding building complexity were also reflected by members of FM teams who described complex buildings which 'the average' occupant could not comprehend. In the case of Buildings A and B, this may be linked to insufficient handover systems, as discussed later in this paper.

Meanings also centred on certain levels of comfort as a minimum working right; that a sustainable building should deliver a minimum 'understood' temperature (Shove, 2004), thus, *"There is more to comfort than temperature but exactly where the expectations lie along this range is, largely, a matter of culture and convention."* (Chappells and Shove 2005: 33).

Meanings around temperature were also visual and linked to elements of competency; occupants of the buildings know how to dress, reflecting their understanding the temperature a sustainable office should maintain.

Positive findings around pride occupying a visibly 'green' building were noted. Respondents were demonstrably proud of their buildings, and the associated green status. This may also be linked to external practices of organisational loyalty. Some occupants perceive the sustainable building as flattening organisational hierarchy, not only in terms of the open plan design in all buildings, but in the shared experience of comfort. One occupant stated *"the acoustics in this building are really odd, sometimes*

it's really hard to work, especially if they are holding events in the atrium, but we're all in it together, even the CEO" (Building, B full time employee, female).

Table 1: Overview of case study office buildings

	BREEAM Cert.	Time in occupation	Floor area (sqft)	Single/Multi Tenanted	Key sustainable physical design features
Building A	Excellent	18 months	26,000 (over 3 floors)	Single-tenanted	Building Management System (BMS), regulating temperature - air exchange and heating, photovoltaic (PV) panels, motion sensor lighting, low useage water systems, solar shading, atrium, open plan with meeting rooms, limited car parking, cycle storage and changing facilities, city centre location.
Building B	Excellent	8 years	76,500 (over 2 floors)	Single-tenanted	BMS regulating temperature - natural ventilation, air exchange and heating, PV panels, motion and daylight sensor lighting, atrium, open plan with meeting rooms and café, limited car parking, cycle storage and changing facilities, town centre location.
Building C	Excellent	3 years (varies according to tenant)	61,000 (over 2 floors)	Multi-tenanted	BMS regulating temperature, natural ventilation, PV panels, Biomass boiler, motion sensor lighting and dimmer-switch street lighting, automatic meter reading, open plan with atrium and café, limited car parking, electric car charging points, changing facilities, city fringe location.

Building B is in the process of establishing a Green Team, each team member will be responsible for setting targets and encouraging colleagues to reduce energy, waste, water and travel more sustainably. However, some respondents commented *"support for the Green Team is not as strong as you would expect"* (Building B, member of Green Team, male). Other respondents confirmed this view, indicating that it was only certain *"keen green types"* who became involved in the Green Team. It is interesting to note the focus of the Green Team on resources and not the services consumed. Membership may be considered elitist; only environmental enthusiasts participate. Findings support the contention that in examining any single element of a practice, a full understanding of the practice is not gained.

Moderating Comfort - Competences
In examining meanings above, a number of interlinking competences were identified. Competences are embodied skills, know-how and techniques required to undertake

practices (Shove *et al*. 2012). Policy and schedules also impact on the development of required competences.

Initial findings highlighted the importance of understanding the sustainable design features of the office buildings. FM Teams in Buildings A and B described very limited handover processes, where cursory information and training were provided on technical systems. Both teams described a slow process of on-site learning, facilitated by informal discussions with sub-contractors. Building C had a more comprehensive handover and a Project Manager remained with the building following completion and handover, undertaking the role of FM.

Building A offered a building tour to all new occupants to encourage them to adapt their behaviour in line with the sustainable features of the building, although no Building User Manual (a requirement of BREEAM) existed. Building B also offered a tour to new occupants; however this often did not happen. New and existing employees in Building B rely heavily on the organisation's intranet for information regarding sustainable features. It was noted, however, that some respondents identified an inability to access this information and linked this to feelings of powerlessness. Another competency that is needed is an understanding that some automated controls can be overridden; lighting in meeting rooms once activated remains illuminated for 20 minutes once occupants have left the room (Building B). Occupants are able to override this feature by simply turning off the lights manually, however most do not as they *"think the building will do everything for them"* (Building B, FM, female).

Understanding occupancy hours appears to be a highly contextualised issue in each building. Building A operates the strictest core working hours, however flexible home working can lead to difficulties in maintaining passive heat (Building A, FM, male). Building B has highly flexible hours as does the multi-tenanted Building C. One respondent in Building B noted that although the office remains open until 8pm, the majority of occupants *"like to start early, and leave early as most people don't live here and have trains to catch or long car journeys, they want to miss rush hour"* (Building B, FM, female), however the building continues to operate as if it were at full occupancy until 8pm regardless of how many occupants are working. Findings show that competences may impact on the practice of moderating comfort and links between elements of practice begin to emerge.

Moderating Comfort - Materials
The final element considered in this deconstructed framwork is materials. Materials refer to the physical entities which are implicated in the production and reproduction of practices (Reckwitz 2002, Shove and Pantzar 2005). Materials in findings relating to moderating comfort include BMS regulating temperature in all case study buildings, cooling and heating systems, motion controlled lighting and override controls, and windows, automated or manually operated. Materials also extend to technical regulatory requirements. Materials other than technical equipment are also important for moderating comfort, including in Building B, the provision of branded fleeces for all employees to wear in cooler temperatures. Meanings surrounding organisational loyalty may be important here. Storage areas for clothing encourage occupants to bring in clothing to respond to temperature changes and create a *"cardigan culture"* (Building C, Tenant, male), although meanings around this type of working uniform appear to be mixed.

Interrelatedness between the elements

Having examined findings in the deconstructed SPT framework, links between the elements of practice are emerging. For example, whilst occupants are able to control their own comfort, meanings associated with feelings of powerlessness over comfort in the building and a lack of required competences can subvert this ability. It is vital to reconstruct practices by understanding how elements interlink, the existence of a practice *"necessarily depends on the existence and specific interconnectedness of these elements and…cannot be reduced to any one of these single elements"* (Reckwitz 2002: 250).

DISCUSSION AND CONCLUSIONS

In analysing initial findings, the potential of SPT as a framework to understand occupants of sustainable office buildings has been considered. SPT provides an opportunity to contextualise the physical features of sustainable buildings. Shove and Pantzar (2005) note that it is not simply by designing a product, or in the context of this research, constructing a sustainable office building, that design intent is realised. Carriers of the practice are essential to shifting the practice from an abstract entity to a practice existing in its own right. This may involve the establishing of new links between elements of practice or the breaking of existing links.

Hypothesised links between elements of practices and between intersecting practices may be drawn from findings. Changing working routines and practices may be tangled up with a desire to 'be green', with what understandings of 'being green' are, with tacit rules of Corporate Social Responsibility, with policy and regulations, with technological development and design, with organisational culture and historical working practices. This wide range of issues reflects Hargreaves' contnention that individual agents alone may be incapable of bringing about change as they are merely carriers of complex practices (Hargreaves 2002).

In considering three sustainable office buildings as case studies, with similar design features, at different points in their occupancy life, a picture of occupancy over time may be generated and further research may identify elements of practice common to each case study. Moreover this study aims to address concerns that buildings must be occupied if they are to rigorously consider the impact of end users (Monfard and Sharples 2011). The limitations of SPT however, must be noted, as this highly contextual analysis prevents generalisations which could be drawn from quantitative datasets, however, it is contended, that in order to change practices and reduce resource consumption, the complexities of daily life and patterns of consumption must be understood. Further research is required to give findings greater contextual depth.

SPT extends the analysis of 'ways of doing' to the development of culture and conventions. The historical significance of working practices and their future trajectories are implicit in the deconstruction of practices. It is contended that SPT permits a wider, more complex analysis of 'why' and 'how' workplace routines and practices are undertaken, and how these practices have developed over time (Shove 2004, Shove and Pantzar 2005, Strengers 2010). The role of material elements, such as the physical features of the building, can then be understood in the context of how technology and design shape practices and ultimately how ambitions of more sustainable working practices may be achieved.

REFERENCES

Bourdieu P (1977) *"Outline of a Theory of Practice"*. Cambridge: Cambridge University Press.

Burgess J, Bedford T, Hobson K, Davies G and Harrison C (2003) (Un)sustainable consumption. In: F Berkhout, M Leach and I Scoones (eds.) *"Negotiating Environmental Change: New Perspectives from Social Science"*. Cheltenham: Edward Elgar.

Carbon Trust (2012) *"Closing the Gap: Lessons learned on realising the potential of low carbon building design"*. http://www.carbontrust.com/resources/guides/energy-efficiency/low-carbon-buildings-design-and-construction.

Chappells H and Shove E (2007) Debating the future of comfort: environmental sustainability, energy consumption and the indoor environment. *"Building Research and Information"*, **33**(1), 32-40.

Choi J H, Loftness V and Aziz A Post-occupancy evaluation of 20 office buildings as basis for future IEQ standards and guidelines. *"Energy and Buildings"*, **46**, 167-175.

Cook I and Crang M. (2007) *"Doing Ethnographies"*. London: Sage.

Evans D, Southerton D and McMeekin A (2012) Sustainable consumption, behaviour change policies and theories of practice. In: Warde A and Southerton D (eds.) *"The Habits of Consumption, COLLeGIUM: Studies across Disciplines in the Humanities and Social Sciences"*. Helsinki: Helsinki Collegium for Advanced Studies.

Giddens, A (1984)*"The Constitution of Society"*. Cambridge: Polity Press.

Halkier B, Katz-Gerro T and Martens L (2011) Applying practice theory to the study of consumption: Theoretical and Methodological considerations. *"Journal of Consumer Culture"*, **11**(1), 3-13.

Hargreaves T (2011) Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *"Journal of Consumer Culture"*, **11**(1), 79-99.

Hauge A L, Thomsen J and Berker T (2011) User evaluations of energy efficient buildings: Literature review and further research. *"Advances in Building Energy Research"*, **5**(1), 109-127.

Heerwagen, J and Zagreus, L (2005) *"The human factors of sustainable building design: Post Occupancy Evaluation of the Philip Merrill Environmental Center"*. Indoor Environmental Quality (IEQ): UC Berkeley.

Jackson T (2005) *"Motivating sustainable consumption: a review of evidence on consumer behaviour and behavioural change: a report to the Sustainable Development Research Network"*. Centre for Environmental Strategy: University of Surrey.

Larsson N (1998) Research Information: Green Building Challenge '98 – International strategic considerations. *"Building Research & Information"*, **26**(2), 118-121.

Menezes A C, Cripps A, Bouchlaghem D and Buswell R (2011) Predicted vs. actual energy performance of non-domestic buildings: Using post-occupancy evaluation data to reduce the performance gap. *"Applied Energy"*, **97**, 355-364.

Monfared I G and Sharples S (2011) Occupants' perceptions and expectations of a green office building: a longitudinal case study. *"Architectural Science Review"*, **54**(4), 344-355.

Magaudda P (2011) When materiality 'bites back': Digital music consumption practices in the age of dematerialization. *"Journal of Consumer Culture"*, **11**(1),15-36.

Payne G and Payne J (2004) *"Key Concepts in Social Research"*. London: Sage

Reckwitz, A (2002) Toward a Theory of Social Practices A Development in Culturalist Theorizing. *"European Journal of Social Theory"*, **5**(2), 243-263.

Schatzki, T R, Knorr Cetina K and von Savigny, E (eds.) (2001) *"The Practice Turn in Contemporary Theory"*. London: Routledge.

Schatzki, (2002) T R *"The Site of the Social: A Philosophical Account of the Constitution of Social Life and Change"*.University Park, PA: Penn State University Press.

Stevenson, F (2009) Post-occupancy evaluation and sustainability: a review. In: Proc. of the ICE-Urban Design and Planning, **162**(3), 123-130.

Sawyer, L, De Wilde, P and Turpin-Brooks, S (2008) Energy performance and occupancy satisfaction: A comparison of two closely related buildings. *"Facilities"*, **26**(13/14), 542-551.

Steemers K and Manchanda S (2009) Energy efficient design and occupant well-being: case studies in the UK and India. *"Building and Environment"*, **45**(2), 270-278.

Shove, E (2010) Beyond the ABC: climate change policy and theories of social change. *"Environment and Planning A"*. **42**(6), 1273-1285.

Shove E (2003) *"Comfort, Cleanliness and Convenience: The Social Organization of Normality"*. Oxford:Berg.

Spaargaren G (2011) Theories of practices: Agency, technology, and culture: Exploring the relevance of practice theories for the governance of sustainable consumption practices in the new world-order. *"Global Environmental Change"*. **21**(3), 813-822.

Strengers Y (2010) *"Conceptualising everyday practices: composition, reproduction and change"*. RMIT University and University of South Australia: Carbon Neutral Communities, Centre for Design.

Shove E and Pantzar M (2005) Consumers, Producers and Practices: Understanding the invention and reinvention of Nordic walking. *"Journal of Consumer Culture"*, **5**(1), 43-64.

Shove E, Pantzar M and Watson M (2012) *"The Dynamics of Social Practice: Everyday Life and how it Changes"*. SAGE Publications Ltd.: London.

United Nations Environment Programme, Sustainable Buildings and Climate Initiative (UNEP-SBCI). [Accessed 12/03/14] http://www.unep.org/sbci/events/UNEP_SBCI_2010.asp

Useable Buildings Trust (UBT). [Accessed 12/03/14] http://www.usablebuildings.co.uk

Warde A (2005) Consumption and theories of practice *"Journal of Consumer Culture"*. **5**(2), 131-153.

Yin R K (2003) *"Case study research: Design and methods"*. 3rd ed. Thousand Oaks, CA: Sage.