



Using practice theory to research energy and environmental governance for small and medium-sized enterprises

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ABSTRACT

If the transition to a low carbon economy is to be successful, inclusive and sustainable, then small and medium-sized enterprises (SMEs) must not be neglected. However, they are extremely heterogenous and it is difficult to make generalisations about their motivations, consumption patterns or everyday practices, or to create effective policies and governance processes.

This social scientific research uses qualitative methods to investigate how and why energy is consumed by organisations, and the role of governance practices in shaping demand. The central research question is:

- How can practice theory be used to improve the effectiveness of UK SME energy and environmental governance?

Five empirical papers answer this question by applying practice theory in various settings:

- Paper 1 focuses on the practice of home and its affective dimensions. Themes of comfort, control and flexibility are revealed, each influencing how energy is consumed and conserved.
- Paper 2 combines practice theory with the concept of sensemaking to show how energy management is intertwined with organisational culture and knowledge construction processes in three SMEs.
- Paper 3 shows that low carbon SME advisors are critical middle actors, but could be more effective if 'softer' skills were deployed alongside technical expertise.
- Paper 4 combines practice theory with the multi-level governance framework to investigate policy implementation as a practice-bundle, spanning spatial and temporal settings.

- Paper 5 asks whether practice theory could follow behavioural economics in gaining influence within government. Findings indicate a need and appetite for practice-theoretical insights amongst government social researchers.

This research demonstrates how practice theory can help to improve the effectiveness of governance practices. However to gain greater influence, researchers need to be philosophically liberal, experimental in their use of theory and methods, and pro-actively develop relationships with governance actors at local and national levels.

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PUBLICATIONS

This thesis is comprised of five papers that have been published in academic journals:

Paper 1: Hampton, S., 2017. An ethnography of energy demand and working from home: Exploring the affective dimensions of social practice in the United Kingdom. *Energy Research & Social Science* 28, 1–10. https://doi.org/10.1016/j.erss.2017.03.012

Paper 2: Hampton, S., 2018. Making sense of energy management practice: reflections on providing low carbon support to three SMEs in the UK. *Energy Efficiency*. https://doi.org/10.1007/s12053-018-9750-5

Paper 3: Hampton, S., 2018. "It's the soft stuff that's hard': Investigating the role played by low carbon small- and medium-sized enterprise advisors in sustainability transitions. *Local Economy* 33, 384–404. https://doi.org/10.1177/0269094218778526

Paper 4: Hampton, S., 2018. Policy implementation as practice? Using social practice theory to examine multi-level governance efforts to decarbonise transport in the United Kingdom. *Energy Research & Social Science* 38, 41–52. https://doi.org/10.1016/j.erss.2018.01.020

Paper 5: Hampton, S., Adams, R., 2018. Behavioural economics vs social practice theory: Perspectives from inside the United Kingdom government. *Energy Research & Social Science* 46, 214–224. https://doi.org/10.1016/j.erss.2018.07.023

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ABBREVIATIONS

BEIS	UK Department for Business, Energy and Industrial Strategy
DCLG	UK Department for Communities and Local Government
DECC	UK Department for Energy and Climate Change
ERDF	European Regional Development Fund
EU	European Union
GHG	Greenhouse Gas
GSR	Government Social Research(er)
LCEGS	Low Carbon and Environmental Goods and Services
LEP	Local Enterprise Partnership
MLG	Multi-Level Governance
OECD	Organisation for Economic Co-operation and Development
PTE	Physical, technical and economic
SME	Small and medium sized enterprise
UK	United Kingdom
UKERC	UK Energy Research Centre

1. INTRODUCTION

1.1 OVERVIEW

1.1.1 CONTEXT

SMEs consume more than 13% of energy globally (IEA, 2015), and in the UK are responsible for over half of the total energy used in public and commercial buildings (Sykes, 2009). There is significant potential for SMEs to reduce their energy consumption and associated greenhouse gas (GHG) emissions. For instance, 18-25% energy savings can typically be made through efficiency measures, a large proportion of which require no capital investment (DECC, 2014). However, take up of these cost-effective opportunities is low.

1.1.2 THE SCALE OF THE CHALLENGE

Defined only by organisational size[1], SMEs are extremely heterogenous. It is therefore difficult to make generalisations about SMEs' motivations, consumption patterns or everyday practices. Yet this category of organisations persists in policy discourse at regional, national and international scales (IEA, 2015), as well as in academic research.

Generating energy and low carbon policy for SMEs is a multi-faceted challenge and the UK Committee on Climate Change reports that they remain 'poorly addressed by existing

1 Definitions of SMEs vary around the world, although all consider them to be non-subsidiary, independent organisations which employ fewer than a given number of employees. The EU sets this number at 250, and additionally specifies that SMEs' balance sheets must not exceed €43m (European Commission, 2003).

policies' (2016). Not only does their heterogeneity make universal approaches difficult, there is resistance to policy 'hard levers' such as tax and regulation which are perceived as burdensome for smaller organisations (Parker et al., 2009). Instead, across OECD countries, incentives such as face-to-face advice and grant funding for energy efficiency measures are preferred by policy-makers. While a substantial 'grey' literature exists in relation to these forms of governance, few academic studies have focused on this policy domain. Given the scale of SME energy demand and environmental impact, the resources required to deliver these incentives, and the lack of extensive academic research conducted on energy and environmental governance for SMEs to date, the motives for this D.Phil project are clear.

1.1.3 APPROACH TAKEN IN THIS RESEARCH

Energy and environmental governance across the OECD is predominantly informed by physical, technical and economic (PTE) principles, and has been criticised for its narrow approach to understanding the dynamics of energy demand (Lutzenhiser, 2014; Janda et al., 2015). This research adopts an alternative approach, drawing on social scientific concepts and qualitative methods to seek deeper insights into how and why energy is consumed by organisations, and the role of energy and environmental policy in shaping demand. The first four empirical papers investigate the topic of SME energy demand and its governance at different scales. Starting in the domestic setting, Paper 1 explores the energy implications of working from home. Paper 2 focuses on SME energy management practice at the level of the organisation, and Papers 3 and 4 analyse policy implementation at the regional scale, respectively investigating the practices of low carbon SME advisors, and the multi-level governance of a transport behaviour change programme. Practice

theory is the principle conceptual framework used in each of these papers, which together contribute to answering this thesis's central research question: how can practice theory be used to improve the effectiveness of UK SME energy and environmental governance?

Having demonstrated the value and policy relevance of practice theory in four empirical applications, a fifth paper, co-authored with a Government Social Researcher (GSR), explores how practice theory might gain more influence within policy discourse in central government, and whether this would be either practical or desirable.

The remainder of this introductory chapter is structured into three parts. Section 1.2 gives further context to the SME energy governance challenge; 1.3 sets out how the research is designed to investigate the central question; and section 1.4 provides an outline of the thesis structure.

1.2 SETTING OUT THE PROBLEM

In the UK, the 2008 Climate Change Act sets a legally binding target for an 80% reduction in GHG emissions by 2050, based on a 1990 baseline (UK Government, 2008). Such a stretching target requires all sectors of society and the economy to decarbonise. Given the scale of their collective energy consumption, SMEs have an important role to play in this transition. However, achieving 80% emissions reductions from a population of 5.7 million SMEs (BEIS, 2017) in the UK is a multi-faceted challenge. This section sets out the main reasons why this is such a difficult problem.

Although there is evidence to suggest that SMEs could save up to 25% of energy consumption through cost-effective efficiency measures (DECC, 2014), research has shown that take-up of these opportunities remains low (Revell and Blackburn, 2004). A significant

literature has sought to understand and explain the reasons why SMEs fail to invest in efficiency measures despite the apparently compelling business case for doing so, describing this phenomenon as the 'energy efficiency paradox' (DeCanio, 1998) (Chapter 2 discusses this in further detail). This is considered by the UK government and EU to be a market failure, and there is wide recognition of the need for policy intervention (DECC, 2014; European Commission, 2017).

However, designing and implementing energy policies for SMEs is not straightforward. Defined only by size, the population of organisations within this category are both numerous and heterogeneous. SMEs operate in every sector of the economy, varying by sector, management structure, legal status and premises type. Further, collecting reliable, representative data on energy used by SMEs at a national scale is an arduous task (Nicholls, 2014). Consequentially, generating policies which apply to all SMEs involves making assumptions, generalisations and trade-offs.

The options available to policy-makers are also limited. SMEs and their representatives are typically resistant to conventional 'hard levers' such as tax and regulation, and SMEs are often exempted from these policies (Hampton and Fawcett, 2017). Administrative bureaucracy and 'red tape' are perceived as barriers to growth and productivity for SMEs (Cabinet Office, 2016). Consequentially, the preferred approach to energy and environmental governance for SMEs across the OECD is based on providing incentives such as grant funding and face-to-face support. For example, since 2007 in the UK, match-funded grants have been available to SMEs through the European Regional Development Fund (ERDF) for investments in energy efficiency measures and low-carbon advisors have been funded to conduct energy audits for organisations occupying non-domestic premises.

Given the high costs associated with direct financial assistance and consultancy support, and the fact that SMEs are exempted from a number of other business and industrial energy policies, these incentive policies warrant close attention. However, little academic research has been conducted on this form of energy and environmental governance. How best to design and implement effective policies for SMEs remains an open question.

A full answer to this question is likely to be multi-faceted and involve contributions from researchers from different academic disciplines as well as governance and industry actors. For example, if SMEs are to be actively involved in the transition[2] to a low carbon economy, their environmental performance depends on their financial sustainability, so understanding the *economic* case for improving environmental performance is essential (Hall et al., 2010). Developing and deploying low-carbon *technologies* is vital for allowing energy services to be delivered to SMEs without a loss of productivity, requiring research in engineering and materials science, and innovation in the low carbon and environmental goods and services (LCEGS) sector (DECC, 2016). Contributions from 'grey' literature are instrumental too, including policy evaluations (European Commission, 2016) instructional reports from international NGOs (IEA, 2015), and peer-to-peer learning (King, 2013). The social sciences also have an important role to play, for instance by providing insights into how and why energy is used, technologies are adopted and management decisions are made by SMEs; and investigating how policies are designed, implemented and evaluated.

[2] The terms 'energy transition', 'low carbon transition' and 'sustainability transition' are used interchangeably in this thesis. This reflects the slightly different audiences of each paper. 'The' transition is also referred to as an apparently singular process. Although this skates over the myriad social, political and technical dimensions involved in tackling climate change, these terms are frequently used in the academic literature as heuristic tools.

The next section describes how this research contributes to the latter category through five empirical papers.

1.3 RESEARCH DESIGN

This thesis aims to contribute towards the improved effectiveness of SME energy and environmental governance by providing in-depth insights into the *practices* involved a variety of contexts. If SMEs are to play a full part in the transition to a low carbon economy, then a wide range of stakeholders must be involved; from government civil servants, to advisors and intermediaries, to SME owner-managers and individual staff. Through their professional practice, each of these actors influence how energy is used and managed by SMEs, and how policy interventions are designed and implemented. This research therefore adopts a wide empirical scope and a broad definition of the term 'governance'. This is interpreted to include the practices of conventional institutions such as central government departments and local authorities, as well as quasi-autonomous non-governmental actors such as local enterprise partnerships (LEPs) and other business support and advisory organisations who play a role in policy development and implementation. More unconventionally, 'governance' is interpreted as encompassing a range of activities, rules and norms which influence energy demand. As such, the management practices, policies and approaches developed by SMEs and their workers are included.

Figure 1-1 provides a visual representation of the research scope, which is structured according to scale. The empirical studies span a range of practices including working from home (Paper 1; Chapter 4); SME energy management practices (Paper 2: Chapter 5); providing low carbon advice to SMEs (Paper 3: Chapter 6); implementing policy at a

regional scale (Paper 4: Chapter 7); and the practices involved in conducting government social research (Paper 5: Chapter 8).

Also shown in Figure 1-1 is the central research question for this thesis: 'how can practice theory be used to improve the effectiveness of UK SME energy and environmental governance?'. The previous section highlighted the significance of the second part of this question, and this section now provides further justification, describing three distinct motivations for placing practices at the centre of the research. In doing so, it also explains how each empirical paper contributes towards addressing the research question.

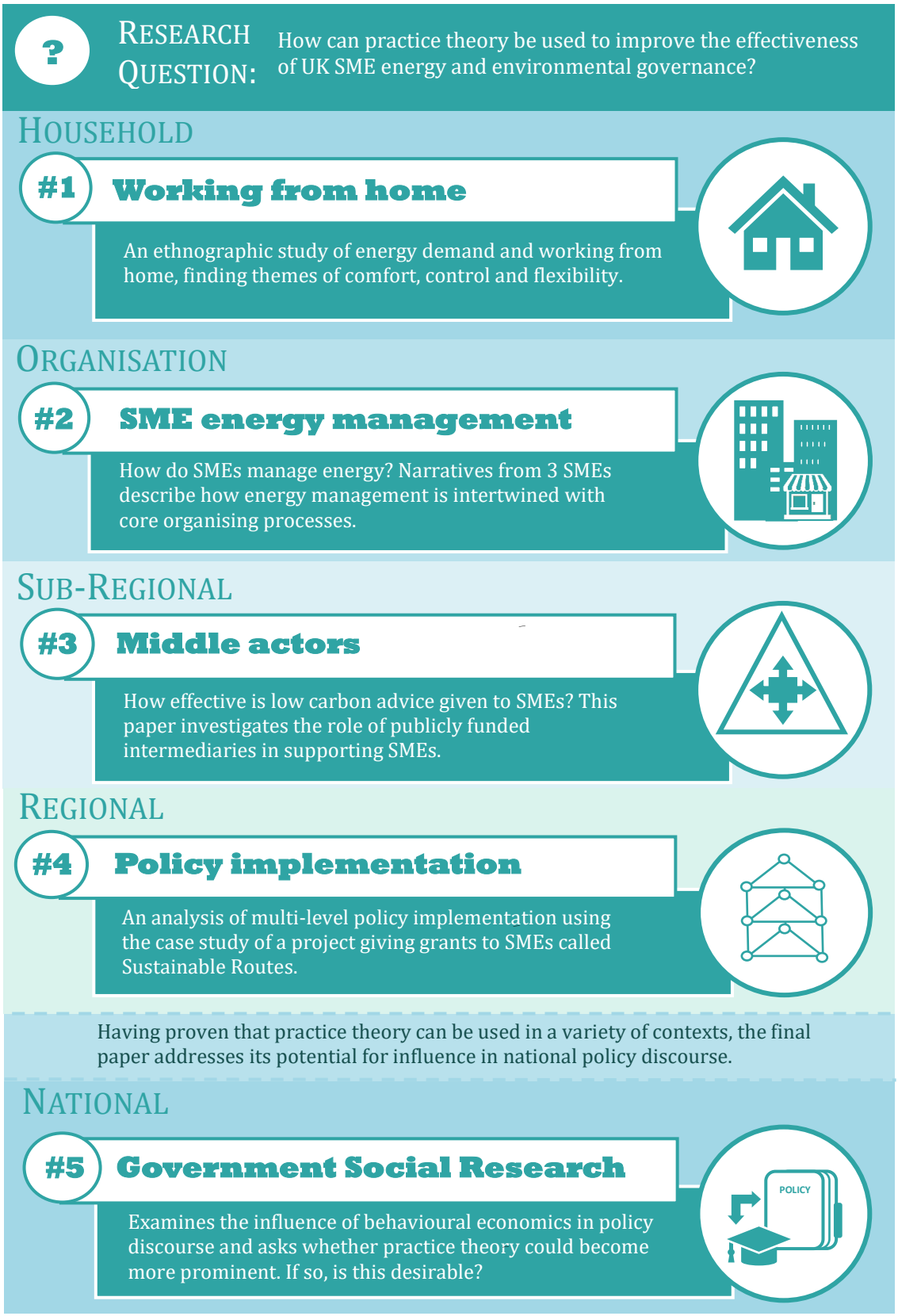


Figure 1-1 - Infographic illustrating the broad scope of this research, which investigates governance practices at different scales.

The first motivation for focusing on practices in this research is as a means of investigating energy related behaviours in SMEs in depth. At an early stage of designing this research, I read a number of studies on SMEs and energy demand which focus on identifying barriers to, and drivers for, the uptake of energy efficiency (DeCanio, 1993; Walker et al., 2008; Trianni and Cagno, 2012; Baranova and Paterson, 2017). I became frustrated with their methodological limitations and a tendency to conceive of decision-making processes in SMEs as over-simplified and linear (see Chapter 2 for further discussion). Conversely, I was inspired by two studies which offered more nuanced explanations of decision-making processes. The first is a theoretical article by McCormack and Schwanen (2011) which reconceptualises decision-making beyond the idea that decisions are taken by discrete actors, in single moments, abstracted from context:

> 'Instead the decision is understood as a differentiated, affectively registered, transformative, and ongoing actualisation of potential against a horizon of undecidability in which past, present, and future fold together in complex ways' (McCormack and Schwanen, 2011, p. 2801).

Developing ideas which resonate with those in practice theory, this article offers a rich framework for investigating energy behaviours in SMEs.

The second study, by Banks et al (2012), was prepared for the UK Department for Energy and Climate Change (DECC) and also offered a more complex explanation of behaviour and decision-making, in this case related to non-domestic energy behaviours. Supported by conceptual devices developed in practice theory, this report called for a shift in thinking away from a model of linear decision-making, towards a greater appreciation of how material, technical, cultural and regulatory domains impact on energy behaviours within the context of everyday business practice.

Papers 1 and 2 each begin with the idea that energy related behaviours are not necessarily the result of deliberative decision-making. Instead, they adopt the perspective promoted in both studies cited above, using ethnographic methods to investigate how energy is bound up in everyday practices.

Paper 1 focuses on the energy implications of the practice of working from home. Given that 59% of SMEs are home-based (BIS, 2015a, 2015b), and 25% of the UK workforce regularly work from home as part of their main job (ONS, 2014), this practice is pertinent for research on the governance of SME energy demand. Working from home is often imbued with the hope of delivering energy savings (Carbon Trust, 2014) and is a target of energy conservation policy for SMEs (see for instance, Sustainable Routes in Chapter 7). However its net effect on energy demand depends on various factors, including the mode, length and energy intensity of the commute; the ability of employers to manage desk-space flexibly; and the technologies and practices involved in heating and lighting the home space (Nelson et al., 2007).

This qualitative study, based on interviews with regular home workers, provides a more in-depth perspective on how and why energy is used compared with quantitative models of household consumption. Placing the practice at the heart of analysis, it explores the meanings, materials and competences involved in home working, and attends to the *affective* experiences of practitioners. Findings show that the practice of working from home is characterised by themes of comfort, control and flexibility, with implications for energy demand. The paper discusses implications for demand reduction, demand shifting and 'smart' controls, with reference to the role of employers, researchers, policy-makers and home workers themselves.

Paper 2 draws on the author's experience of providing energy and environmental support to SMEs from 2013-2018, presenting narrative accounts of energy management practices for three SMEs: a business services provider, a charity, and a manufacturer / online retailer. Findings show that despite energy management being perceived as a peripheral business activity, it is intertwined with their core activities. Beginning with the notion that energy facilitates almost *all* business activity, it investigates how its management interweaves with other organising processes. The three-element model of practice theory (Shove et al., 2012) is used as both a methodological aid and analytical framework, and the concept of organisational sensemaking is used to trace how in each SME, new meanings were made, and reflexive knowledge was co-constructed with an external advisor.

A second motivation for focusing on practices in this research is because incentive-based energy policies are designed to be implemented at close quarters. Unlike universal policies such as taxes or product standards, grants and expert advice across the EU are delivered at regional and local scales, involving in-depth engagements with individual SMEs. The nature of these interactions is therefore critical to the success of energy and environmental support programmes, and the third and fourth papers investigate the practices involved in implementing regional business support policy.

Paper 3 investigates governance practices relating to regional SME incentive-based policy programmes. This study focuses on the role of low carbon SME advisors in the UK, using auto-ethnographic data in combination with interviews. Contributing to a growing literature which seeks to understand the current and potential role of 'middle actors' in supporting the energy transition, findings show that establishing and sustaining

engagements with SMEs on the topic of pro-environmental behaviour is a multi-faceted, complex challenge. Advisors typically approach SMEs with promises of cost savings rather than using environmental messaging, and focus their resources on the provision of building energy audits and technical advice. Despite usually being committed environmentalists themselves, advisors rarely engage business managers in values-based discussions, or by seeking to understand how and why energy is used in the course of everyday organisational practice.

This paper observes that the majority of energy and environmental initiatives are integrated with the structures of conventional business support institutions and their existing networks. It discusses the implications of incorporating environmental objectives into the narratives of economic growth and job creation which dominate business support practice. The merger of these policy domains is a relatively recent phenomenon, and little academic research has been conducted into the delivery of low carbon advice for SMEs. The paper argues that face-to-face meetings could be better utilised if 'softer' skills were deployed alongside technical expertise. However, this would require reform in the practice of advice-giving, whereby alternative meanings and new competences could be incorporated with the support of social scientifically informed policy.

Paper 4 is an in-depth case study of an individual incentive programme called Sustainable Routes. The project, running from 2009-2015 and funded by the ERDF, offered grants and advice to SMEs in south-east England to reduce their transport-related emissions. Exemplifying the model of multi-level governance (MLG), responsibility for project implementation was shared between a coalition of actors operating at multiple scales. The plethora of activities involved in implementing Sustainable Routes is considered in this

paper as a bundle of governance practices (Shove et al., 2012), and concepts developed in practice theory are used to analyse a combination of auto-ethnographic, documentary and interview data. This includes the 'three-element model', which categorises elements of practice into meanings, materials and competences (Shove and Pantzar, 2005; Shove et al., 2012; Kuijer, 2014), and the notion of connected situationalism (Nicolini, 2016), which has been developed to assist practice-centred analyses of large-scale phenomena.

'Zooming in' (Nicolini, 2009) on periods of disruption following project audits, findings trace how tension and conflict arose in the relationships between actors, played out through the changing constellation of meanings, materials and competences. They highlight for example, how the reinterpretation of policy documentation led material elements such as bicycles to become associated with meanings of risk and liability, requiring practitioners to develop a new set of competences. This empirical account demonstrates the value of, and the difficulties associated with, using practice theory for analysing multi-actor, multi-scalar research data.

The third motivation for focusing on practice in this study is to contribute towards the burgeoning tradition of using practice theory within energy research, and it does this in three main ways. Firstly, while practice theory has been used to highlight how energy demand and environmental impacts occur as part of mundane social activity (Shove and Walker 2014), the majority of empirical studies have focused on the domestic setting (Shove, 2003; Hand et al., 2005; Mylan and Southerton, 2017). Few studies have applied the principles of practice theory to research in non-domestic domains, and to business and governance practices (Keller et al., 2016; Powells et al., 2015). The four papers described above address this gap by using practice theory in the context of

working from home (Paper 1: Chapter 4); energy management (Paper 2: Chapter 5); low carbon business support (Paper 3: Chapter 6); and policy implementation (Paper 4: Chapter 7).

Secondly, while practice theory has been used to make valuable contributions towards understanding the histories, trajectories and dynamics of energy demand, studies using it have been criticised for having had relatively little policy impact (Keller et al., 2016; Sahakian and Wilhite, 2014). This is partly because notable proponents have used the broad perspective that practice theory offers to argue for radical, rather than incremental change (Shove, 2010; Shove et al., 2012; Strengers, 2012; Shove, 2017). This tension is explicitly discussed in the fifth empirical paper of this thesis (Chapter 8), which focuses on the use of social scientific research within the UK government. Co-authored with a Government Social Researcher (GSR), it compares the relative success of behavioural economics with practice theory, which have often been discussed in opposition to one-another (Shove, 2010; Whitmarsh et al., 2011).

Drawing on auto-ethnographic insights and interviews with GSRs working on energy and climate change, it charts the rise of behavioural economics within the UK government, discussing the reasons behind its success, and its limitations. GSRs' perspectives on energy research using practice theory are presented, juxtaposed with arguments which help to explain why policy engagement is not a ubiquitous ambition for all researchers. Findings show that GSRs actively engage with a range of theoretical approaches and social scientific methods. They express enthusiastic interest in research using practice theory, but point to a need for particular forms of evidence if they are to use it in their own practice.

Applying insights from the two theories themselves, the paper suggests ways in which GSRs could help, and be helped, to incorporate practice theory into policy discourse.

A third contribution to the use of practice theory in energy research made throughout this thesis is to explore its potential to be used in combination with other conceptual frameworks. Paper 1, for example, explores the *affective* dimensions of practice. Whereas practice theory has primarily been developed in the sociological tradition and rarely used by geographers (Reid and Ellsworth-Krebs, 2018), this paper draws on geographical literature on affect and non-representational theory to develop an account of home workers' experiences which attends to the embodied and tacit dimensions of practice. Social scientific energy research has developed as its own thriving field, drawing on a range of social theory (Sovacool, 2014; Sovacool et al., 2015). This study indicates the potential for using literature from cultural geography more extensively in energy research.

Paper 2 (Chapter 5) supplements the use of practice theory with the concept of sensemaking, which has been developed in organisational studies (Weick, 1995). Whereas practice theory helps to articulate the role played by material artefacts, cultural meanings and embodied competences in social activity, it is argued that sensemaking deals more sensitively with processes of meaning-making and knowledge construction in organisations. It is used in combination with practice theory to analyse the results of the close, long-term relationships developed between the author as a business advisor, and the three SMEs in focus.

However, using practice theory in combination with other concepts is not without controversy, given the propensity for practice theory to be defined in *opposition* to other perspectives (Reckwitz, 2002). For example, the psychological research tradition and its

focus on individuals is often presented in sociological literature as fundamentally at odds with a practice perspective, and has led to open debate (Shove, 2010; Whitmarsh et al., 2011; Shove, 2011). In pursuing more effective energy and environmental governance, the papers adopt a philosophically liberal approach which would be (and has been) criticised by those with more a purist stance.

Paper 3 (Chapter 6), for example, argues that the provision of low carbon advice for SMEs could be made more effective using insights from psychology *and* practice theory. It suggests that advisors could develop greater impact by engaging their clients in *values-based* discussions, as well as paying close attention to how and why they consume energy in *practice*.

Paper 4 (Chapter 7) is no less controversial. This study draws on multi-level governance (MLG) literature to help construct a picture of multi-actor policy implementation as a bundle of practices. This – now published - contribution has proved contentious, with strong and sometimes opposing views expressed by four peer reviewers, and in personal communications with academics at recent workshops (Hampton, 2017; BSA Workshop, 2018). The main antagonism expressed has been the use of 'levels' within MLG, which is thought by some to be at odds with the flat ontology that underpins some versions of practice theory. The paper discusses the inherent tensions at play when trying to use practice theory to analyse multi-actor, multi-scalar phenomenon, and joins a number of academic papers using the three-element model (Spotswood et al., 2015; Higginson et al., 2015; Kuijer, 2014) in ways in which its authors do not wholly approve.

Paper 5 (Chapter 8) – published very recently - has the potential to be even more contentious, as it enters the intellectual affray between behavioural and practice-based

social science. Juxtaposing behavioural economics and practice theory in the context of government social research, it suggests that the two approaches may have more in common than some academics wish to accept. Identifying reasons behind the success of behavioural economics reveals some insights for practice theorists wishing to achieve policy influence. As well as comparing 'chalk with cheese' (Shove, 2011), the desirability of policy influence is disputed within practice-based energy research, so this publication could prove provocative.

To summarise, the five empirical papers in this thesis aim to explore how a focus on practices, supported by other theoretical frameworks, may help to improve the governance of the SME energy transition. Addressing this challenge with a focus on the UK is particularly timely. As explained above, a significant proportion of energy and environmental policy for SMEs is funded and strategically shaped by the EU. With the UK due to formally leave the EU in March 2019, the governance of the SME energy transition will become a solely domestic responsibility. This major shift will put into sharp focus the practices of working from home, energy management, low carbon advice, policy implementation and policy making. By providing in-depth insights into each, it is hoped that this research and its associated outputs will become pertinent to unfolding governance discourse and practice.

1.4 THESIS STRUCTURE

This thesis follows the University of Oxford's requirements for a D. Phil by publication. Chapters 4 to 8 have been prepared for and submitted to international, peer-reviewed journals. At the time of submitting this thesis, four of the five papers have been published.

Table 1-1 summarises the empirical focus, methods used, and theoretical frameworks employed in the five papers included in the thesis.

Table 1-1 - Overview of the five empirical papers submitted as part of this thesis.

	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5
Topic	Working from home	SME energy management	The role of low carbon SME advisors	Multi-level policy implementation	Use of social theory in government
Empirical focus	An ethnographic investigation into how energy is used in the practice of working from home.	Three case studies of SMEs and their energy management practices.	Publicly funded low carbon SME advisors in England.	Case study of a multi-level behaviour change programme targeted at SMEs.	The use of social theory by government social researchers.
Theories used	Practice theory: three-element model Affect Non-representational theory	Practice theory Sensemaking	Practice theory: attending to everyday activity in organisations Personal values literature	Practice theory: the three-element model; connected situationalism Multi-level governance	Practice theory (general) Behavioural economics (nudge)
Methods used	Semi-structured interviews Auto-ethnography	Semi-structured interviews Carbon footprints Auto-ethnography	Semi-structured interviews Carbon footprints Auto-ethnography	Auto-ethnography Semi-structured interviews Document analysis	Semi-structured interviews Auto-ethnography (by co-author)
Publication status	Published in June 2017 in *Energy Research & Social Science* Vol 28,1-10, after three rounds of peer review.	Published in October 2018 in *Energy Efficiency,* after two rounds of peer review.	Published in June 2018 in *Local Economy* Vol 33, 384–404, after two rounds of peer review.	Published in April 2018 in Energy Research & Social Science (Vol 38), after five rounds of peer review.	Published in August 2018 in *Energy Research & Social Science* Vol 46,214-224 after 3 rounds of peer review and comments from 6 reviewers.

To provide context for the empirical papers, three further Chapters are included in this thesis.

Chapter 2 is a high-level literature review. Because each of the empirical papers include a review of the relevant literature, this chapter provides wider context by reviewing three separate literatures. The first section reviews work on the SME low carbon transition. It examines evidence on SME energy consumption and environmental impact, estimates of energy saving potential, and energy-related behaviour and decision-making. Section two outlines the prevailing policy approaches to reducing energy and GHG emissions from SMEs in the UK. The third section introduces practice theory, describes its rise within energy research, and reviews how it has been used to study organisations and governance.

Chapter 3 explains the rationale for the methodological approach used in this thesis. It outlines and justifies the scope chosen for the empirical chapters; explores the methodological implications of using practice theory in empirical research; and discusses the principle methods used. A summary of the practical details involved in conducting the research is provided.

Chapter 9 concludes this thesis by explaining how each of the empirical chapters contribute to answering the central research question. It then provides a set of *meta*-conclusions based on the research as a whole. This chapter critically reflects on the use of practice theory in the thesis, and discusses implications for future research. In light of the research findings, observations are made about the state of SME energy and environmental governance in the UK in late 2018, including implications for policy design and implementation after Brexit.

A final note on thesis structure is to say that for the convenience of the reader, references are provided at the end of each chapter, rather than collected together at the end of the thesis.

1.5 REFERENCES

Banks, N., Fawcett, T., Redgrove, Z., 2012. What are the factors influencing energy behaviours and decision-making in the non-domestic sector? A rapid evidence assessment.

Baranova, P., Paterson, F., 2017. Environmental capabilities of small and medium sized enterprises: Towards transition to a low carbon economy in the East Midlands. Local Econ. 32, 835–853.

BEIS, 2017. Business population estimates for the UK and regions 2017.

BIS, 2015a. Small Business Survey 2014: Businesses with no employees (No. BIS research paper number 225). Department for Business, Innovation and Skills.

BIS, 2015b. Small Business Survey 2014: SME employers (No. BIS research paper number 214). Department for Business, Innovation and Skills.

BSA Workshop, 2018. Practice theory: connections and methodologies, in: Regional Postgraduate Events. Lancaster University.

Cabinet Office, 2016. Cutting Red Tape home page [WWW Document]. Cut. Red Tape. URL https://cutting-red-tape.cabinetoffice.gov.uk/ (accessed 11.29.16).

Carbon Trust, 2014. Homeworking: Helping Businesses Cut Costs and Reduce Their Carbon Footprint.

Committee on Climate Change, 2016. Next steps for UK heat policy. Committee on Climate Change.

DeCanio, S.J., 1998. The efficiency paradox: bureaucratic and organizational barriers to profitable energy-saving investments. Energy Policy 26, 441–454.

DeCanio, S.J., 1993. Barriers within firms to energy-efficient investments. Energy Policy 21, 906–914.

DECC, 2016. Potential of Smart Technologies in SMEs.

DECC, 2014. Research to Assess the Barriers and Drivers to Energy Efficiency in Small and Medium Sized Enterprises. DECC.

European Commission, 2017. Good practice in energy efficiency.

European Commission, 2016. Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF) (WP1: Synthesis Report).

European Commission, 2003. Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (No. (notified under document number C (2003) 1422)).

Hall, J.K., Daneke, G.A., Lenox, M.J., 2010. Sustainable development and entrepreneurship: Past contributions and future directions. J. Bus. Ventur., Sustainable Development and Entrepreneurship 25, 439–448. https://doi.org/10.1016/j.jbusvent.2010.01.002

Hampton, S., 2017. Muddling through the practice of policy implementation: An ethnographic study of a multi-level behaviour change project.

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Hand, M., Shove, E., Southerton, D., 2005. Explaining Showering: a Discussion of the Material, Conventional, and Temporal Dimensions of Practice. Sociol. Res. Online 10, hand.

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

IEA, 2015. Accelerating Energy Efficiency in Small and Medium-sized Enterprises, Policy Pathway.

Janda, K., Wilson, C., Moezzi, M., Bartiaux, F., 2015. Improving efficiency in buildings: conventional and alternative approaches, in: Ekins, P., Bradshaw, M., Watson, J. (Eds.), Global Energy: Issues, Potentials and Policy Implications. Oxford University Press, Oxford, pp. 163–188.

Keller, M., Halkier, B., Wilska, T.-A., 2016. Policy and Governance for Sustainable Consumption at the Crossroads of Theories and Concepts. Environ. Policy Gov. 26, 75–88. https://doi.org/10.1002/eet.1702

King, D., 2013. The Ups and Downs of ERDF Experiences from the University of Nottingham.

Kuijer, L., 2014. Implications of Social Practice Theory for Sustainable Design (PhD Thesis). Delft University of Technology.

Lutzenhiser, L., 2014. Through the energy efficiency looking glass. Energy Res. Soc. Sci. 1, 141–151. https://doi.org/10.1016/j.erss.2014.03.011

McCormack, D.P., Schwanen, T., 2011. Guest Editorial: The Space—Times of Decision Making. Environ. Plan. A 43, 2801–2818. https://doi.org/10.1068/a44351

Mylan, J., Southerton, D., 2017. The Social Ordering of an Everyday Practice: The Case of Laundry. Sociology 003803851772293. https://doi.org/10.1177/0038038517722932

Nelson, P., Safirova, E., Walls, M., 2007. Telecommuting and environmental policy: lessons from the ecommute program. Transp. Res. Part Transp. Environ. 12, 195–207. https://doi.org/10.1016/j.trd.2007.01.011

Nicolini, D., 2016. Is small the only beautiful? Making sense of "large phenomena" from a practice-based perpsective. pp. 98–113.

Nicolini, D., 2009. Zooming In and Out: Studying Practices by Switching Theoretical Lenses and Trailing Connections. Organ. Stud. 30, 1391–1418. https://doi.org/10.1177/0170840609349875

ONS, 2014. Characteristics of Home Workers, 2014. Office for National Statistics.

Parker, C.M., Redmond, J., Simpson, M., 2009. A Review of Interventions to Encourage SMEs to Make Environmental Improvements. Environ. Plan. C Gov. Policy 27, 279–301. https://doi.org/10.1068/c0859b

Powells, G., Bell, S., Judson, E., Lyon, S., Wardle, R., Capova, K., Bulkeley, H., 2015. Fostering active network management through SMEs' practises. Energy Effic. 1–14. https://doi.org/10.1007/s12053-015-9382-y

Reckwitz, A., 2002. Toward a theory of social practices: a development in culturalist theorizing. Eur. J. Soc. Theory 5, 243–263.

Reid, L., Ellsworth-Krebs, K., 2018. Nudge(ography) and practice theories: Contemporary sites of behavioural science and post-structuralist approaches in geography? Prog. Hum. Geogr. 030913251775077. https://doi.org/10.1177/0309132517750773

Revell, A., Blackburn, R., 2004. SMEs and their response to environmental issues in the UK. Kingston Business School, Kingston University.

Sahakian, M., Wilhite, H., 2014. Making practice theory practicable: Towards more sustainable forms of consumption. J. Consum. Cult. 14, 25–44. https://doi.org/10.1177/1469540513505607

Shove, E., 2017. What is wrong with energy efficiency? Build. Res. Inf. 1–11. https://doi.org/10.1080/09613218.2017.1361746

Shove, E., 2011. On the Difference between Chalk and Cheese—A Response to Whitmarsh et al's Comments on "beyond the ABC: Climate Change Policy and Theories of Social Change." Environ. Plan. A 43, 262–264. https://doi.org/10.1068/a43484

Shove, E., 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. Environ. Plan. A 42, 1273–1285. https://doi.org/10.1068/a42282

Shove, E., 2003. Converging conventions of comfort, cleanliness and convenience. J. Consum. Policy 26, 395–418. https://doi.org/10.1023/A:1026362829781

Shove, E., Pantzar, M., 2005. Consumers, producers and practices: understanding the invention and reinvention of Nordic walking. J. Consum. Cult. 5, 43–64. https://doi.org/10.1177/1469540505049846

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Sovacool, B.K., 2014. What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda. Energy Res. Soc. Sci. 1, 1–29. https://doi.org/10.1016/j.erss.2014.02.003

Sovacool, B.K., Ryan, S.E., Stern, P.C., Janda, K., Rochlin, G., Spreng, D., Pasqualetti, M.J., Wilhite, H., Lutzenhiser, L., 2015. Integrating social science in energy research. Energy Res. Soc. Sci. 6, 95–99. https://doi.org/10.1016/j.erss.2014.12.005

Spotswood, F., Chatterton, T., Tapp, A., Williams, D., 2015. Analysing cycling as a social practice: An empirical grounding for behaviour change. Transp. Res. Part F Traffic Psychol. Behav. 29, 22–33. https://doi.org/http://dx.doi.org/10.1016/j.trf.2014.12.001

Strengers, Y., 2012. Peak electricity demand and social practice theories: Reframing the role of change agents in the energy sector. Energy Policy 44, 226–234. https://doi.org/10.1016/j.enpol.2012.01.046

Sykes, R., 2009. Engaging SMEs to improve their Energy Efficiency: A Market Appraisal. DECC.

Trianni, A., Cagno, E., 2012. Dealing with barriers to energy efficiency and SMEs: Some empirical evidences. 7th Bienn. Int. Workshop "Advances Energy Stud. 37, 494–504. https://doi.org/10.1016/j.energy.2011.11.005

UK Government, 2008. Climate Change Act, c27.

Walker, B., Redmond, J., Sheridan, L., Wang, C., Goeft, U., 2008. Small and medium enterprises and the environment: barriers, drivers, innovation and best practice: A review of the literature. ECU Publ. Pre 2011.

Weick, K.E., 1995. Sensemaking in organizations, Foundations for organizational science. Thousand Oaks.

Whitmarsh, L., O'Neill, S., Lorenzoni, I., 2011. Climate Change or Social Change? Debate within, amongst, and beyond Disciplines. Environ. Plan. A 43, 258–261. https://doi.org/10.1068/a43359

2. LITERATURE REVIEW

This chapter places this research in the context of literature on SME energy demand and environmental impact, the governance of the SME energy transition, and the traditions of practice theory. It is divided into three parts. Section 2.1 provides an overview of research on SMEs, energy and the environment, including available evidence on energy consumption and saving potential, and literature on behaviour and decision-making. Section 2.2 summarises the main policy and governance approaches used in the UK to bring about the low carbon transition for SMEs. Section 2.3 outlines the principles of practice theory and its distinct schools. It traces its rise within social scientific energy research, and reviews how it has been applied to the study of organisations and governance. Section 2.4 summarises the chapter.

2.1 SMES, ENERGY AND THE ENVIRONMENT

Reflecting the heterogeneity of SMEs themselves, literature on SMEs, energy and the environment is fragmented. Researchers from a variety of academic disciplines and governance institutions have addressed the questions of how to encourage SMEs to use energy more efficiently, and to reduce their environmental impact. Contributions have come from disciplines such as sociology, organisational studies, economics, geography, environmental sciences and psychology, although the nature of the topic also attracts multi and cross-disciplinary approaches (Aykol and Leonidou, 2015). There is also a wealth of 'grey literature' produced or commissioned by central government departments, local authorities, consultancies, think tanks and non-governmental organisations (NGOs). The following sub-sections review evidence on SME energy consumption and environmental impact; energy saving potential; and behaviour and decision-making.

2.1.1 SME ENERGY CONSUMPTION AND ENVIRONMENTAL IMPACT

Methodologies used to collect data on energy consumption by SMEs vary internationally, meaning that it is difficult to make reliable comparisons and global estimates. For example, whereas the USA measures energy used for manufacturing by business size, Australia collects data on SME energy consumption by fuel type. In Europe, figures are largely unavailable at the national scale. For example, while the IEA quotes estimates that 70% of energy used in the Italian industrial sector comes from SME manufacturers (2015), its cited source (Trianni and Cagno, 2011) includes only an estimate of 'over 60%', with no further reference provided.

The UK government estimates that SMEs in the UK spend £49.6bn annually on all forms of energy consumption (DECC, 2016). Of all energy use in non-domestic buildings, SMEs are estimated to represent 57% of electricity and 50% of gas demand (DECC, 2015). However, these national figures are approximations based on different datasets with notable discrepancies and there is a need to update the evidence base (Nicholls, 2014). Further, energy consumption in non-domestic buildings does not represent the totality of SME demand, nor their greenhouse gas (GHG) emissions. 59% of SMEs operate from domestic premises in the UK (BIS, 2015a, 2015b) meaning that when designing policy, simple segmentation based on non-domestic building type is insufficient to capture the breadth of SME energy demand. Transport also represents a major source of energy consumption by SMEs. It has been suggested that travel demand management may represent the largest opportunity for savings (DECC, 2016), however disaggregating national travel data to identify SME behaviours is a complex and error-prone task (Anable et al., 2012).

In addition to being energy consumers, SMEs play other important roles in the energy system. For example, they represent 86% of employment in the UK construction sector (1.8 million) and employ 46% of workers (2.3 million) in the motor vehicles trade and repair industry (BIS, 2015c). As such they influence the ways in which energy is consumed in the built environment and by the transportation system. Further, at a time of radical change on both the supply and demand side of the energy system, SMEs are playing an important part in competing with incumbent organisations, disrupting traditional business models and developing new technologies (Energy Systems Catapult, 2017). Throughout this thesis however, the primary focus is on the practices involved in governing SMEs' own energy consumption and environmental impact.

2.1.2 ENERGY SAVING POTENTIAL

There is a broad consensus in the academic and grey literature that there are significant opportunities for energy savings and GHG emissions reductions from SMEs. UK government research estimates that SMEs could reduce energy costs by 18–24% by maximising energy efficiency opportunities (DECC, 2014). Their report estimates that SMEs in the UK could save between £1.26bn and £2.63bn by using energy more efficiently in buildings, with 37% of the savings requiring zero capital investment (ibid.). The International Energy Agency's estimates at the global scale are even higher. Their research found that cost-effective energy efficiency measures could reduce as much as 30% of consumption in a typical SME (IEA, 2015).

Despite the availability of low, or 'zero' cost opportunities such as behavioural change and improved operation of energy-using equipment (DECC, 2014), studies have shown that uptake is low amongst SMEs (Revell and Blackburn, 2004; DeCanio, 1993; DEFRA,

2006). Energy makes up a relatively low proportion of operational expenditure for most small and micro enterprises in the UK, with 66% and 71% reporting spending 10% or less of overall site costs on electricity and gas respectively (Lomax and Parry, 2015). This leads many commentators to assume that efficiency measures are likely to be a peripheral consideration for SMEs (DECC, 2014; Instinct and Reason, 2015; BEIS, 2017a). This assumption is corroborated by evidence from a survey which found that more than 60% of SME owners do not regard energy efficiency as a priority, and only 1 in 10 had made energy savings in the previous 12 months (Scottish Power, 2016).

2.1.3 ENERGY BEHAVIOUR AND ENVIRONMENTAL DECISION-MAKING IN SMES

The systemically low uptake by SMEs of what appear to be cost-effective energy and emissions savings opportunities has been described as the 'energy efficiency paradox' (DeCanio, 1998). In response, a substantial literature has sought to explain why SMEs fail to take action in the face of apparently compelling financial logic. The most common approach to tackling this problem is to identify the *barriers to* and *drivers for* pro-environmental action (DeCanio, 1998, 1993, Sorrell et al., 2011, 2000; Fleitera et al., 2012; Crocker, 2012; DECC, 2014). The notion of the energy efficiency paradox is based on the principles of economic decision-making, and the majority of such studies seek to identify factors leading to the 'bounded rationality' of SMEs (Simon, 1955). Sorrell et al (2000), for example, developed a taxonomy of barriers affecting organisations across the public and private sectors. Under their 'economic' category, barriers include the heterogeneity of technologies and measures available; the hidden costs associated with staff resource, disruption and information gathering; insufficient access to capital for

investing in energy efficiency; the split-incentive relating to building tenancy; and lack of information which may lead to cost-effective energy efficiency opportunities being missed. However the authors acknowledge that social sciences other than economics offer alternative models for decision-making, and they identify additional barriers under the heading 'behavioural perspective'. Here, factors that might inhibit action include: limited cognitive resources on behalf of individual decision-makers; a propensity for inertia; poor presentation of information; and a distrust of external sources of advice. Finally, drawing on organisational theory, they suggest that internal power relations; the cultural status of energy management within an organisation; and the nature of its environmental impacts can impede action.

Sorrell et al's taxonomy is typical of this literature, and a number of studies have produced similar lists. Using empirical data from a sample of SMEs, it is common to rank their significance (Brunke et al., 2014; Fleitera et al., 2012; Hudson and Roloff, 2010; Lewis and Cassells, 2010; Trianni and Cagno, 2012). However, critiques have been made of both the methods used and the theoretical assumptions which underpin these evaluative assessments (Sorrell et al., 2011; Banks et al., 2012; Hampton and Fawcett, 2017). For example, each of the barrier studies cited above use interview and self-reported survey data from SME owners and managers as their primary methods for laying out and evaluating barriers and drivers, raising questions about their reliability. In their sample of Italian SMEs for example, Trianni and Cagno (2012) use Sorrell et al's (2000) taxonomy to rank barriers to energy efficiency. They find – perhaps unsurprisingly - that their interviewees and survey respondents reported that 'lack of managerial awareness' was the least significant barrier, with 'access to capital' or 'lack of information on investment payback times' relating to energy efficient technologies scoring higher. It seems unlikely

that owners and managers would identify their own lack of awareness as a significant barrier, as it is difficult to have insight into a lack of personal awareness. It is also possible that when explaining the reasons for their inaction, respondents may have sought to minimise their personal responsibility regarding a topic with ethical implications. This example illustrates that the validity of self-reported barriers is open to question, particularly as an isolated form of evidence.

A more fundamental criticism of this approach relates to its epistemological conception of behaviour and decision-making. Implicit in the systematic evaluation of barriers is the idea that their removal will logically result in organisations taking steps towards greater efficiency. A number of energy researchers have rejected this simplistic causal assumption, drawing on a wealth of social scientific literature on behaviour and decision making to present alternative approaches to understanding why SMEs under-invest in energy efficiency measures (Chatterton, 2011; Hargreaves, 2011; Banks et al., 2012; Janda et al., 2015). Mallaburn (2016), for example, produced a report for the UK Committee on Climate Change which argues for a move away from the identification of barriers and drivers, towards an appreciation of *salience* in organisations. Citing work by Catherine Cooremans (2011) who has argued that energy efficiency measures are most often taken by businesses when they align with their *strategic* objectives, Mallaburn categorises types of salience driver, including those relating to *external* branding and public perception; *internal* framings of investment opportunities; and *sectoral* influences such as local networks and supply chains. His report emphasises evidence from European peer-to-peer networks focused on energy efficiency which shows that significant demand reductions can be achieved by building on sectoral salience drivers (Bruijn and Lulofs, 2001; Köwener et al., 2014; Paramonova and Thollander, 2016).

Two separate research articles happen upon the letter 'c' as a focus for more expansive research on SME energy behaviour and environmental decision-making. Presenting the case for a new research agenda on corporate responsibility for SMEs, Laura Spence (2007) argues for a greater focus on the *character* of owner-managers; the family and community influences on the *confines* of the firm; and how SMEs *change* by growing, restructuring, and through personnel turnover. These three 'c's are complemented by a further two which relate to academic research. She suggests that to achieve *credibility* with different audiences, researchers must help make the business case for investment, use appropriate language, and develop robust and relatable theories and methodologies. Finally, systematic *comparisons* between enterprises of different sizes and in different political and sectoral contexts can help to articulate and explain variations in approaches to corporate responsibility.

Lutzenhiser et al (2002) also use 'c's to develop a framework for policy-makers to think more broadly about energy related decision making in organisations. In a study for the California Energy Commission in response to the energy supply crisis of 2000, the authors found that organisations' responses varied significantly, influenced by three key factors. Firstly, the scale, timings and patterns of consumption influenced the ways in which organisations became *concerned* with disruptions in the supply and price of energy, and subsequently responded with mitigating actions. Second, responses depended on the particular *conditions* encountered by the business*,* for instance whether tenancy contracts hindered investments in building retrofit, or whether technologies and data were available. Finally the authors found that an organisation's ability to take action depended on their *capacity,* which includes internal factors such as access to capital, technical resources and supportive management; and external factors such as relationships with utilities, trade

associations and even individual tradesmen. The '3Cs framework' developed in this report has since been used not only to describe factors influencing decision-making, but to develop new ways to conceptualise and envision social communities with creative potential in non-domestic settings (Janda, 2014; Janda et al., 2014).

Each of these studies, offering nuance and careful insight into SME energy behaviours, have motivated the approach taken in this research. However, as mentioned in Chapter 1, two studies on decision-making by Banks *et* al, and McCormack and Schwanen were particularly inspiring. The former study was produced for the UK Department for Energy and Climate Change (DECC), and involved a rapid evidence assessment of literature on non-domestic energy behaviour. The authors develop a conceptual framework (Figure 2-1) to argue that energy behaviour in organisations is influenced by five different levels of activity. These are (1) the choices made by individuals within organisations; (2) organisational sub-cultures; (3) an organisation's procedures, histories and ethos; (4) its relationships with external actors; and (5) socio-technical landscapes, which are shaped by broader social, material, market and regulatory domains. Banks et al's extensive literature review found that the majority of studies on energy related decision-making focused on the latter stages of the process, for example where different options for efficiency investments are evaluated using cost-benefit analysis. In response, their framework offers a broader perspective on organisational decision-making. The authors emphasise the importance of earlier stages of decision-making, where energy wastage is *noticed* as an issue, and different options for improving efficiency are gathered together. Although the scope of the report is on organisations of all sizes, their findings are particularly pertinent for SMEs, where formal decision-making processes are less common,

and where influences from each of the five levels are likely to be felt more acutely (Schaefer et al., 2018; IEA, 2015; Janda, 2014; North and Nurse, 2014; North, 2016).

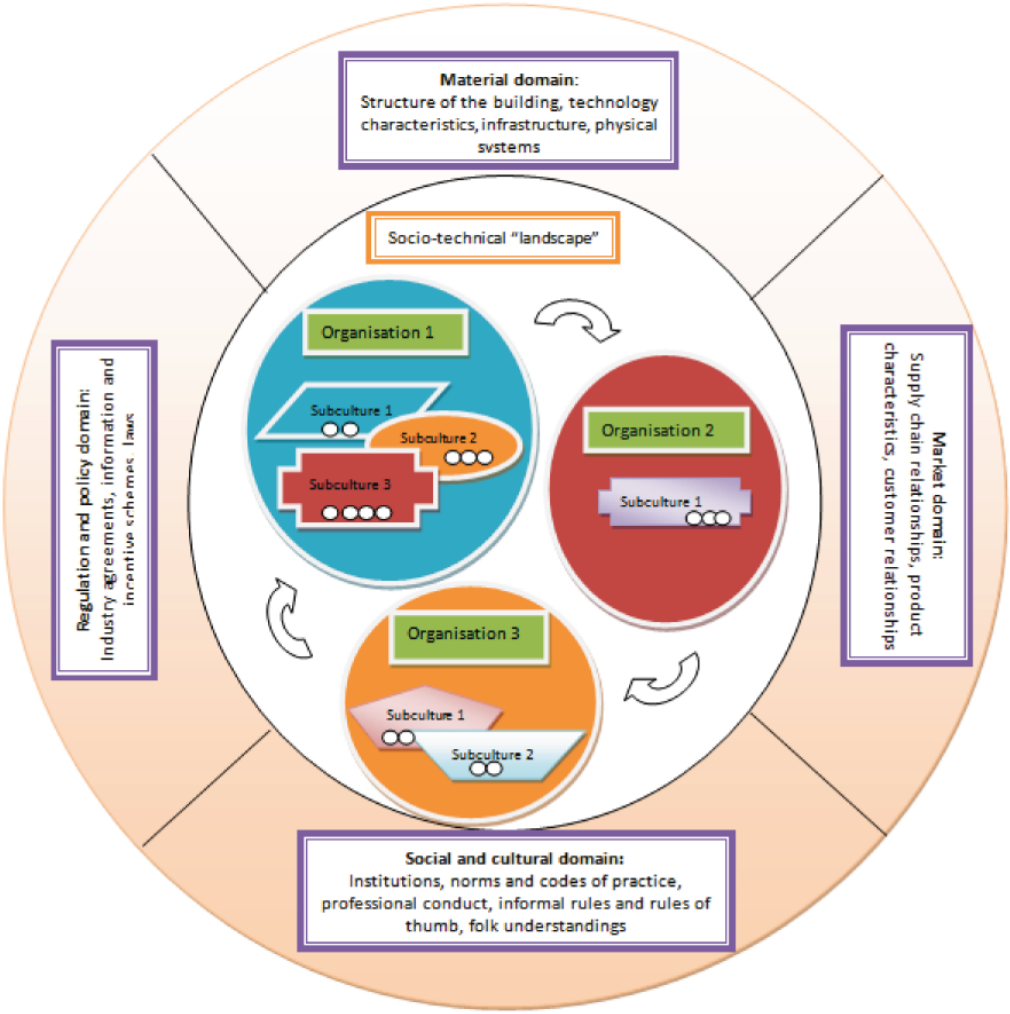


Figure 2-1 – Conceptual framework developed by Banks et al (2012) for understanding decision-making in organisations.

McCormack and Schwanen radically reconceptualise decision-making in their theoretical article. Building on ideas from human geography, they develop provocative 'propositions' for rethinking decision-making, including decentring the individual, and emphasising the role of materiality and different spatial and temporal settings. They suggest that decision-making processes are just as much *affective* as they are intellectual, and that decision-

makers themselves are moulded and 'called into being' through these performative events. Far from being discrete, formal events, they argue that decisions emerge from the context of social activity, rules and laws, have *durations,* and can never be fully explained with empirical data.

There are parallels between this theoretical perspective and the notion of organisational sensemaking as developed by Weick (1995; Weick et al., 2005) and extended by others within organisational studies (Abolafia, 2010; Cunliffe and Coupland, 2012; Brown et al., 2015). Sensemaking conceives of organisations as the outcome of *organising processes,* developing their own cultures, norms and processes as they respond to and make sense of collective experiences. Sensemaking research attends to how meanings, identities and knowledge are constructed through processes such as retrospection, performative enactments or the telling of stories (Weick, 1995; Weick et al., 2005). The question 'how can I know what I think until I see what I say?' exemplifies the model of performative meaning-making at the heart of sensemaking literature, and tallies with McCormack and Schwanen's account of the emergent nature of decision-making.

In summary, the social scientific studies cited here have each helped to expand our understanding of organisational energy behaviour, adding nuance and theoretical depth to more basic models such as rational economics and the barriers and drivers approach. They provided inspiration in the early stages of planning this research, and their influence can be seen in the empirical chapters of this thesis.

2.2 POLICY AND GOVERNANCE FOR THE SME ENERGY TRANSITION

The low uptake of energy and emissions savings opportunities by SMEs is considered by the UK government and EU to be a market failure (DECC, 2014; European Commission, 2017), and there is wide acceptance of the need for policy intervention. Whereas a range of policies have been developed in the UK to ensure that corporations take steps to mitigate climate change according to the 'polluter pays' principle, SMEs are often exempted from regulation, taxes and market-based mechanisms. The rationale for these exclusions is expressed by a narrative of protecting SMEs from the burden of bureaucracy and paper-work, which are perceived as barriers to growth and productivity (Cabinet Office, 2016). SMEs are considered to have limited capacity for economies of scale, to suffer from lack of information, time or expertise to deal with regulations or administrative rules, and to find it more difficult or expensive to access capital than larger organisations. Thus regulation has a disproportionate effect in terms of cost and administration on SMEs (Nyman, 2016). The term 'red tape', meaning excessive bureaucracy or adherence to official rules, dates back to the 16th century, being used to bind the eighty petitions issued to the Pope by King Henry VIII when seeking a divorce from Catherine of Aragon (Dickson, 2014). Its negative connotations still pervade European political discourse today. The European Commission held a conference and competition for 'Red Tape Reduction' (High Level Group on Administrative Burdens, 2014), while the UK regularly surveys businesses' perceptions of regulation (BEIS, 2016) and has created a programme called 'Cutting Red Tape' which reviews policy in different sectors on a rolling basis (Cabinet Office, 2016).

When compiling a list of national and European level policies which impact SMEs, three categories emerged: (1) universal, economy-wide policies, (2) interventions targeting the organisation as a unit; and (3) measures specifically designed for SMEs.

Universal policies are those whose focus is on addressing products, markets, infrastructures and technologies that cut across all sectors of the economy, affecting organisations of all sizes as well as individual consumers. The EU's Ecodesign and Energy Labelling Directive (European Commission, 2009) is one example, where minimum efficiency standards are applied to energy consuming products used by all sectors of the economy, such as air-conditioners, refrigerators and lighting appliances. Similarly, the Energy Performance of Buildings Directive (European Commission, 2010) sets standards for efficiency in new buildings - domestic and commercial - and requires the publication of energy performance certificates when premises are advertised for sale or rental. Other universal policies affecting SMEs include Landfill Tax and Fuel Duty.

Not all universal policies use the 'hard levers' of tax and regulation however, and smart meters are being rolled out as a universal policy, affecting all domestic dwellings and non-domestic buildings in the UK. BEIS estimates that there is potential for an economic net-benefit of £2bn by 2030 from the roll out of smart meters to SMEs (2017b), and aims to have them deployed across two million sites by 2020.

Another set of policies are designed to target organisations, but include exemptions for smaller energy users. The EU Emissions Trading Scheme (EUETS) for example, seeks to limit emissions from the largest energy-using installations, such as power stations and industrial plants, while the UK's Carbon Reduction Commitment (CRC) – a mandatory carbon reporting and pricing scheme – requires only businesses consuming more than 6,000 MWh of electricity per year to participate. Article 8 of the Energy Efficiency Directive (EED), transposed into national law as the UK's Energy Savings Opportunity Scheme (ESOS), requires only large enterprises to carry out regular energy audits. While the

rationale of focusing on the largest energy consumers to deliver the greatest change at minimal administrative cost is reasonable, the scale of change required to meet the EU's 40% GHG reduction target by 2030 (European Commission, 2016) means that excluding the collectively significant contribution from SMEs poses a risk to policy-makers. Other policies focused on organisations include the Producer Responsibility regulations, which oblige businesses handling packaging waste, batteries, electric and electronic equipment (EEE) and end-of-life vehicles (ELV) to comply with regulations designed to increase recycling (European Commission, 2014).

While policies such as the EUETS and ESOS exclude *all* SMEs, another major UK policy – an energy tax called the Climate Change Levy (CCL) – affects all but the smallest organisations. The CCL exemption threshold is set relatively low[3] meaning that those whose energy consumption equates to three typical UK households have to pay tax at the full rate (Ofgem, 2017). Significant reductions in Levy rates are available for signatories to Climate Change Agreements (CCAs)[4] (Environment Agency, 2014). However, it is likely that the majority of SMEs do not benefit from these reductions, as industries which are dominated by SMEs such as construction, vehicle repair and maintenance and those offering professional services are not represented by CCAs.

[3] This tax is payable on gas (0.195 p/kWh, €0.22 c/kWh) and electricity (0.559 p/ kWh, €0.64 c/kWh) consumption for all businesses using more than 4397 kWh/ month and 1000 kWh/month respectively.

[4] Signatories' CCL payments are reduced by 90 % for electricity and 65 % on other fuels based on commitments to energy and emissions reductions.

The various exemptions from organisational policies leave a significant policy gap for SMEs. A third category of policies therefore targets SMEs exclusively, and these largely take the form of incentives for pro-environmental action. These include financial measures such as grants and loans for efficient technologies, expert advice including subsidised energy audits, and facilitated peer networks focused on reducing energy consumption. The provision of smart meters can also be seen as a form of incentive for organisations to change their energy consuming and conserving practices.

Incentive-based policies for SMEs in England are the focus of research in this thesis. Here, publicly funded assistance for SMEs to reduce their environmental impact is integrated into the broader provision of business support, which is delivered at the local level. Since they replaced regional development agencies in 2011-2012, Local Enterprise Partnerships (LEPs) have led this area of SME policy, commissioning, and often implementing, business support projects (Britton and Woodman, 2014). The primary objectives of these organisations are to stimulate growth and generate jobs across the economy (Heseltine, 2012), and they are supported with significant resources by central government and through the European Structural and Investment Funds (ESIF), worth €10.8bn (£9.1bn) from 2014–2020. Energy and the environment are becoming an increasingly prominent part of LEPs' remit, particularly since the publication of the national Clean Growth Strategy in October 2017 (HM Government, 2017). However, there remains considerable variation in the ways that LEPs are incorporating these priorities into their strategic plans, and a recent benchmarking study found that LEPs were performing relatively well with regards to promoting low carbon innovation, but inadequately addressing overall emissions reductions and climate adaptation risks (Sustainability West Midlands, 2017).

Through their oversight of ESIF, LEPs are responsible for awarding projects under the European Regional Development Fund (ERDF). ERDF includes a variety of strands dedicated to supporting SMEs, including 'Priority 4b', which aims to bring about the 'shift to a lower carbon economy'. Funding under this Priority amounts to £670m from 2014-2020, (European Commission, n.d.), and is awarded by LEPs to a variety of regional projects, implemented by Local Authorities, Growth Hubs[5], non-profits and charities. Typically, projects offer energy audits, advice and grant subsidies for investment in new energy saving equipment, although some projects offer other services such as feasibility assessments for the deployment of renewable generation and the translation of research (MHCLG and BEIS, 2018). Projects often aim to build on existing business networks focused on environment and sustainability, or establish new ones. Typical examples include the Staffordshire Sustainable Business Network (SBEN, n.d.) and the Low Carbon Network for SMEs in Greater Manchester (ENWORKS, 2017).

Table 2-1 - A summary of key energy and environmental policies in the UK. Grey text indicates where SMEs are exempted from policies.

	Tax	Regulations and standards	Incentives
Universal policies which affect SMEs	• Landfill tax • Fuel duty	• Product standards (e.g. design and labelling) • Building standards and Energy Performance Labelling *(some*	• Smart meter roll-out

[5] Growth Hubs are part of LEPs. They have publicly facing brands, offering support to SMEs.

		exemptions based on size) • Vehicle emissions standards	
Organisational	• Climate Change Levy (CCL) • Carbon Reduction Commitment (CRC)	• EU Emissions Trading System • Mandatory audits (ESOS) • Producer responsibility regulations	• Climate Change Agreements (linked to CCL)
SME Specific		•	• Grants • Advice • Loan finance • Networks

Table 2-1 provides an overview of the principal energy and environmental policies in the UK. Although this list is not exhaustive, splitting policies into categories helps to demonstrate the preferred, incentive-based, approach to designing policy for SMEs. Whether this range of policies is sufficient for ensuring that SMEs play their full part in meeting the UK's climate targets is an important question, but is beyond the scope of this research. By saying SMEs are 'poorly addressed by existing policies', the Committee on Climate Change, whose role it is to evaluate whether necessary policies are in place to meet interim carbon budgets, suggests that the answer is probably 'no'. While this thesis does not seek to answer this question, it is inspired by its implications. Given that SMEs are affected by relatively few taxes and regulations, significant faith is put into incentive-based policies. Understanding the ins and outs of the practices involved in implementing these, and their impacts on SMEs, is the aim of Papers 2, 3 and 4.

2.3 PRACTICE THEORY

One of the aims of this thesis is to explore how practice theory might be used to 'improve the effectiveness of energy and environmental governance'. This is not only ambitious, but is unconventional and has proven to be somewhat controversial. This section provides context to the way that practice theory is used in the papers. The first sub-section provides an overview of the theoretical foundations of practice theory. The second charts the rise of practice theory within energy research, summarising different frameworks developed in this field and explaining why the three-element model is used most prominently in this thesis. The final section reviews literature in which practice theory has been used to investigate organisations and governance practice.

The previous chapter explained that as a way of innovating practice theory in energy research, each paper uses it in combination with other theoretical approaches. Each paper introduces these and reviews their associated literature, and so to avoid duplication, the remainder of this chapter focuses on practice theory as a whole.

2.3.1 THE PHILOSOPHICAL ROOTS OF PRACTICE THEORY

Like all social theory, practice theory builds a conceptual framework for understanding and explaining the dynamics of social phenomena. How it differentiates itself from other explanations of the social world is that it places practices - not minds, bodies, objects, relations or texts - at the centre of the picture (Reckwitz, 2002). Drawing together these elements in an ontological bundle, a practice is a ‘temporally unfolding and spatially dispersed nexus of doings and sayings’ (Schatzki, 1996), and is considered to be the ‘site of the social’ (Reckwitz, 2002).

The roots of practice theory are usually traced back to the work of Bourdieu and Giddens, both of whom sought to move beyond the 'structure-agency' dichotomy which had come

to dominate theoretical discourse in sociology. Giddens' structuration theory asserts that social structures have a recursive constitution, meaning that agents perform social actions against a background of rules and norms, and in doing so, consolidate and (re)construct these structures. Given that it is through activity that the social world is constituted, the focus of attention therefore becomes the social practice.

In an *Outline of a Theory of Practice,* Bourdieu (1977) develops the concepts of *habitus,* the *social field,* and *doxa* to help construct his new sociological theory. Bourdieu's *habitus* is a 'system of internalised structures, schemes of perception, conception, and action common to all members of the same group or class' (1977, p. 86), meaning that an individual's participation in the social world is shaped by the internal rules, norms and narratives that they carry with them. The *habitus* connects past and present, helping to explain why social practices are sustained over time and spread amongst social groups. *Fields*, for Bourdieu, are established social settings in which structures and regulations are played out, for instance in the home, or the laboratory. *Doxa* explains the degree of stability that exists between *habitus* and the particular *field* settings. The more embedded structures are, the more they reproduce themselves through the practices of individuals.

Whereas Bourdieu's *Outline of a Theory of Practice* (1977) is often interpreted along similar lines to Giddens' work, as a kind of theoretical compromise to move beyond the structure-agency problem, Lizardo (2004) argues that this is a misinterpretation of his sociological treatise, which instead renders the structure-agency binary *irrelevant*. The *habitus*, for Lizardo, can be interpreted as a form of 'creative cognitive sociology', owing much to the work to the psychologist Jean Piaget. Piaget's account of cognition gave prominence to practical knowledge as much as internal thought-processes, and Lizardo

argues that the *habitus* includes its own interpretation of structure as occurring *within* these different cognitive domains. Cognitive structures are often forgotten in sociological accounts which build on Bourdieu's work, focusing instead on the structures in Bourdieu's *field*, which for Lizardo are secondary, and leave behind the careful development of cognition in his work.

Whereas practice theory is often interpreted in opposition to the psychological, individualist traditions (Reckwitz, 2002; Shove, 2010), Lizardo's interpretation of Bourdieu's work shows that its ontological foundations are not at odds with concepts developed in psychology. This is a point developed by Spaaragen et al (2016) in their recent account of contemporary developments within practice theoretical research. They explain that in some variants, such as Shove et al's (2012) development of the three-element model, *materials* are put on the same ontological footing as *meanings* and *competences,* and the individual is almost entirely erased from the picture. By contrast, in Schatzki's accounts of practice-arrangement-bundles and flat ontology (Schatzki, 2001, 2016), there remains a distinct role for the sovereign individual, as material arrangements are employed, manipulated and constructed by practitioners in their performances of doings and sayings. That there continues to be disagreement about something as fundamental as the ontological status of the individual in practice theory demonstrates that its philosophical foundations are not set in stone.

This brief summary of different strands within the tradition of practice theory indicates why it is often referred to in the plural, as 'theories of practice'. Although this equivocal term may be an accurate description for a dispersed set of ideas and schools of thought, in this thesis, practice theory is referred to largely in the singular. This is because one of the aims

of this research is to explore the potential for policy-relevant applications and for it to inform empirical analysis. For any social theory to be successful in these ambitions, it is necessary to distil often complex and abstract ideas, despite the philosophical compromises this may involve. Although there is ongoing theoretical debate and resistance by some researchers to the idea of a unified theory, other authors have summarised the distinctive, common principles which bind together the variants of theories of practice. These are summarised in Figure 2-2.

- The ontological structure of the social world is 'flat'.
- The practice is the principal unit of interest and analysis.
- Activity and performance are central to practice.
- A prominent role is given to material elements such as the body and material objects.
- The social world is both relational and recursively constructed.
- Knowledge is understood broadly, including embodied and tacit dimensions.
- Attention is paid to the historically and geographically situated nature of social practices.

Figure 2-2 – A summary of principles common to 'theories of practice'. (Developed using Nicolini, 2012; Reckwitz, 2002; Gram-Hanssen, 2010; Shove et al., 2012)

2.3.2 PRACTICE THEORY IN ENERGY RESEARCH

Practice theory has become influential in social scientific research on energy demand, especially since the publication of Shove's paper entitled: 'Converging conventions of comfort, cleanliness and convenience' (2003). Moving beyond the idea that energy

demand is a result of conscious individual choice, Shove demonstrates that consumption is an incidental aspect of what constitutes 'normal' everyday activities, such as showering or laundry. Outlining the three 'converging conventions' which drive energy demand, she highlights how average internal room temperatures increased drastically in the second half of the 20th century as expectations of thermal *comfort* changed; how notions of *cleanliness* and hygiene led to an increase in water consumption of 70% over a thirty-year period; and how technology enabled energy consuming activities such as travel to be *conveniently* compressed into daily schedules.

Since Shove's 2003 paper, energy research using practice theory has proliferated. With a strong focus on the residential setting, scholars from a variety of disciplines, publishing in a range of journals, have applied its insights to studies of showering (Hand et al., 2005), household electrical appliances (Gram-Hanssen, 2010); laundry (Mylan and Southerton, 2017) and domestic lighting (Crosbie and Guy, 2008).

Practice theory has taken such a hold within energy research that different theoretical models have developed within this niche. The 'three-element model', which is most often attributed to Shove et al (2012), was first outlined by Shove and Pantzar (2005) in a paper about the development of Nordic walking. Initially described as *images*, *stuff* and *skills*, the three categories of elements were refined in their later work, becoming *meanings, materials* and *competences.* This model captures the physical, cognitive, and embodied dimensions of practices in a simple way which can be readily applied in empirical studies of energy consuming practices (Spotswood et al., 2015).

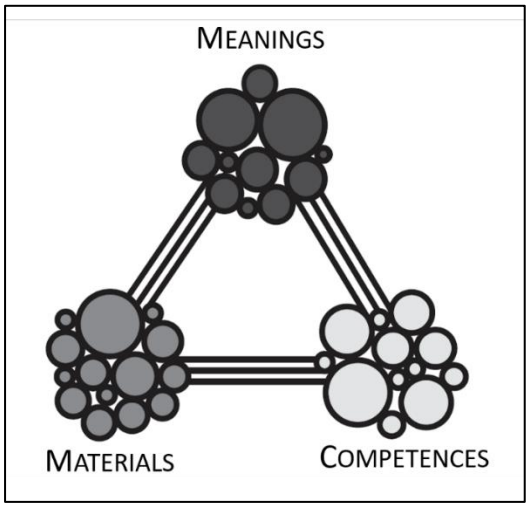


Figure 2-3 - Kuijer's development of the three-element model (2014). Each 'bubble' represents an element of practice, the size showing the relative significance of each.

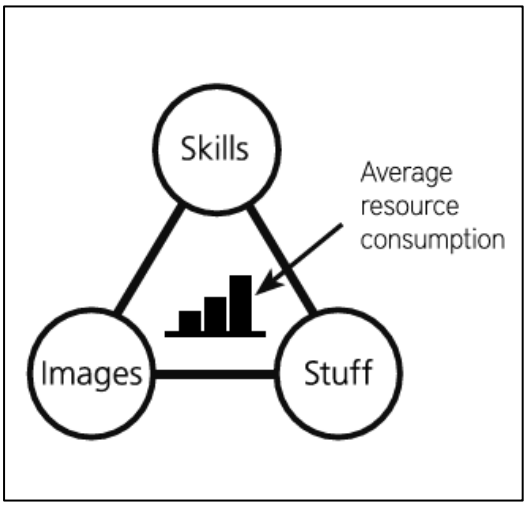


Figure 2-4 – Kuijer (2014) suggests that quantitative estimates of resource consumption could be integrated into the three-element model.

The three-element model has been employed and developed by energy researchers for different ends. Kuijer (2014), for example, uses diagrams to depict the relative importance of some elements over others using differently sized circles (Figure 2-3). This can be used to portray separate performances of practices such as laundry, where both the tumble dryer and the clothes peg are important materials, but rarely feature together simultaneously. She also suggests that resource consumption associated with individual practices could be quantified and integrated into the diagram (Figure 2-4), allowing a visual comparison of intensive and non-intensive activities.

Developing her 'bubble model' from Shove and colleagues' three-elements, Kuijer laid the theoretical groundwork for quantifying aspects of social practices: a task which has been picked up by others including Higginson et al (2015) and Narasimhan et al (2017). These efforts are reviewed in the methodology chapter.

As discussed above, Shove and colleagues' adaptation of practice theory, including the three-element model, goes further than other variants in dispensing with the individual (Spaargaren et al., 2016). For Kirsten Gram-Hanssen, this is a move too far, and in developing her own model, she distinguishes between two types of competences: (1) non-verbal knowledge and know-how, and (2) explicit, rule-based, or theoretical knowledge (Gram-Hanssen, 2010). Retaining a place for values, choices and motivation as drivers of energy consumption, she is concerned with how these are influenced by technologies, material structures and myriad social engagements. This places Gram-Hanssen firmly in what Schatzki has called the 'humanist' school of practice theory (Schatzki, 2001); acknowledging the central role played by the individual practitioner in 'integrating' the various elements of practice.

Other models emerging from energy research and studies of consumption which have strong links with practice theory include Stevenson and colleagues' 'energy cultures' framework, which incorporates material cultures and cognitive norms alongside practices in seeking to understand how cultural formations influence energy demand (Stephenson et al., 2010, 2015). Like Gram-Hanssen's humanist model, energy cultures places the individual in the centre of the picture, performing and coordinating energy practices. Reflecting on empirical applications of the model in recent years, Stephenson suggests that this helps to generate valuable findings: attending to the lived experience of individuals provides insights into wider energy cultures (Stephenson, 2018).

Finally, Warde's contribution to the development of practice theory in the Journal of Consumer Culture (2005) has more in common with Shove and colleagues' stance. Whereas the figure of 'the consumer' has become well established in business and policy

discourse, Warde refutes its value and existence. He argues that it is more useful to consider consumption not as a practice itself, but as occurring 'within and for the sake of practices'. In his variant of practice theory, the consumer, along with the individual, 'evaporates' from view.

These diverse interpretations of practice theory demonstrate the influence of the tradition within social scientific research on energy and resource consumption. While Gram-Hanssen, Stephenson et al's and Warde's models each offer unique and valuable perspectives, in this thesis, the three-element model is used as the principle heuristic for two main reasons.

Firstly, of the models described, it is the most widely used in energy research. As well as providing the basis for theoretical development by Kuijer and others, it has provided a toolkit for empirical data analysis (Spotswood et al., 2015; Westrom, 2018; Wolff et al., 2017), and a framework for thinking about how policy and governance intervene in the plenum of practices (Spurling and McMeekin, 2015; Naus and van der Horst, 2017; Horne et al., 2016). These researchers have set a precedent for adapting the three-element model to support their empirical analysis, and these developments are built on in this thesis.

Secondly, this research set out with an experimental ambition, to explore the potential to apply practice theory to SME energy and environmental governance. Whereas the majority of energy research using practice theory has focused on the domestic setting and household practices, little research has been conducted which investigates energy governance, nor business practices (Keller et al., 2016; Powells et al., 2015). Indeed, one of the anonymous peer-reviewers of Paper 2 said: 'the use of practice theory in the case of SMEs is appropriate (*and about time*), and, it turns out, a powerful exercise' (Italics

added). Further, one of the ambitions of this thesis is to contribute towards the theoretical development of practice theory within energy research. It does this through explorative combinations with other conceptual frameworks, including theories of affect (Paper 1), sensemaking (Paper 2), and multi-level governance literature (Paper 4). Given these unorthodox ambitions, the simplicity of the three-element model allows space for experimentation.

Notwithstanding these two justifications however, as this research project has panned out, the use and adaptation of the three-element model has proven to be more controversial than anticipated, generating disapproval from Shove and colleagues at Lancaster University (BSA Workshop, 2018). This controversy is reflected on in the concluding chapter.

2.3.3 PRACTICE THEORY IN ORGANISATIONAL AND GOVERNANCE RESEARCH

Practice theory has not yet been used to investigate SME energy and environmental governance in a comprehensive way (Keller et al., 2016; Powells et al., 2015). However, it has been applied in studies of business, policy and governance beyond energy and the environment. Writing in *Organization Science,* Feldman and Orlikowski (2011) argue that by moving away from the structure-agency dichotomy, practice theory offers an alternative ontological account of the organisation, as emerging from the doings and sayings that occur within and beyond it. They point to a small but growing literature which has offered new perspectives on organisational behaviour and decision-making by reconceptualising practices such as *strategising* as a relational and enacted practice (Whittington, 2006;

Johnson et al., 2007), and *knowledge* as an ongoing social accomplishment with cognitive and embodied dimensions (Orlikowski, 2002).

The radically alternative way of thinking about business, professional and governance practice offered by practice theory has since been applied to studies of various professions. These include research on the construction of knowledge in librarians' practice (Pilerot and Lindberg, 2018); the practices of car restorers in which embodied knowledge is a central feature (Lloyd and Olsson, 2018); and the inter-organisational networks which are sustained in the Italian motorsport industry through collaborative practices (Mariotti and Haider, 2018).

Davide Nicolini's (2012) contribution to work on practice theory and organisations is perhaps the most comprehensive to date. In his seminal text, he identifies philosophical synergies between praxeology and organisational studies, and constructs a 'theory-method package' to equip researchers interested in this intersection. As well as assisting in the study of organisational practice, Nicolini's work has also helped those interested in using practice theory to investigate policy and governance processes, and multi-sited institutions (Arts et al., 2013; Brunet, 2018). His contributions to the study of large-scale phenomena are discussed in the following chapter, and utilised in Paper 4.

Those using practice theory in organisational studies have shifted from focusing on organisations to *organising processes* (Johnson et al., 2007; Chia, 2013). This move itself is not new however, and has parallels with the notion of sensemaking as discussed above (Weick, 1995; Weick et al., 2005; Brown et al., 2015). Acknowledging their linkages, Nicolini (2012) argues that whereas sensemaking considers organisations as discursive constructions, a practice perspective affords greater ontological status to material objects

and bodies. In Paper 2, the two concepts are used in combination to uncover insights into energy management practice for three SMEs. The focus on knowledge construction offered by sensemaking complements the attention to material artefacts in practice theory.

While the practice turn is well underway in organisational studies, relatively few studies have used practice theory to investigate governance practice. For Brunet, whose empirical work focuses on the multi-level governance of major infrastructure projects (2018; Brunet and Aubry, 2016), practice theory can help to think differently about projects, not as discrete entities to be 'managed', but as bundles of governance practices. On a practical level, she argues that this perspective encourages a close attention to the mundane practices that constitute major investment and construction projects such as weekly coordination meetings, quality assurance checking and risk analysis. This allows for careful comparisons between different governance approaches. More theoretically, she also illustrates how material artefacts such as codified governance frameworks are rarely static, but are interpreted and adapted as part of the recursive ontology of project-governance. Paper 4 in this thesis was published shortly before Brunet's paper, but discusses gratifyingly similar themes. Both papers demonstrate the potential for further research on governance practices using practice theory.

This short review of practice theory within organisational and governance literature is not intended to be exhaustive, but to indicate that there is a thriving community of researchers in this field applying practice theory to the study of organising and (to a lesser extent) governing practices. However, there remains a significant research gap at the intersection of this literature and energy research. The papers in this thesis address this gap.

2.4 CONCLUSIONS AND CHAPTER SUMMARY

This chapter has reviewed a diverse range of literature, from abstract practice theoretical texts, to the applied 'grey' literature produced by UK government departments. This breadth reflects the broad and explorative ambitions of this thesis, using practice theory to provide alternative perspectives on SME energy and environmental governance.

This chapter has revealed a number of gaps in academic literature such as the use of practice theory to study the SME energy transition; and identified areas where research is thin on the ground, such as in providing insights into SME energy behaviours and decision making beyond the identification of barriers and drivers. It has also revealed significant gaps in energy and environmental policy relating to SMEs, which appear to be insufficient to ensure that SMEs play their full part in the energy transition. With a significant proportion of the policies identified in section 2.2 derived from the EU, there remains a significant open question relating to the shape of the governance landscape for SMEs when the UK is no longer a member. This question is revisited in the concluding chapter.

2.5 REFERENCES

Abolafia, M.Y., 2010. Narrative Construction as Sensemaking: How a Central Bank Thinks. Organ. Stud. 31, 349–367. https://doi.org/10.1177/0170840609357380

Anable, J., Brand, C., Tran, M., Eyre, N., 2012. Modelling transport energy demand: A socio-technical approach. Energy Policy 41, 125–138. https://doi.org/http://dx.doi.org/10.1016/j.enpol.2010.08.020

Arts, B., Behagel, J., Bommel, S. van, Koning, J. de, Turnhout, E. (Eds.), 2013. Forest and Nature Governance: A Practice Based Approach, World Forests. Springer Netherlands.

Aykol, B., Leonidou, L.C., 2015. Researching the Green Practices of Smaller Service Firms: A Theoretical, Methodological, and Empirical Assessment. J. Small Bus. Manag. 53, 1264–1288. https://doi.org/10.1111/jsbm.12118

Banks, N., Fawcett, T., Redgrove, Z., 2012. What are the factors influencing energy behaviours and decision-making in the non-domestic sector? A rapid evidence assessment.

BEIS, 2017a. Business awareness and uptake of energy audits.

BEIS, 2017b. Non-domestic smart metering policy proposals and draft legal text: government response.

BEIS, 2016. Business Perceptions Survey 2016 (BEIS Research Paper No. 293).

BIS, 2015a. Small Business Survey 2014: SME employers (No. BIS research paper number 214). Department for Business, Innovation and Skills.

BIS, 2015b. Small Business Survey 2014: Businesses with no employees (No. BIS research paper number 225). Department for Business, Innovation and Skills.

BIS, 2015c. Business population estimates for the UK and Regions (Statistical Release No. URN 15/92).

Bourdieu, P., 1977. Outline of a Theory of Practice. Cambridge University Press.

Britton, J., Woodman, B., 2014. Local Enterprise Partnerships and the low-carbon economy: Front runners, uncertainty and divergence. Local Econ. 29, 617–634. https://doi.org/10.1177/0269094214548664

Brown, A.D., Colville, I., Pye, A., 2015. Making Sense of Sensemaking in Organization Studies. Organ. Stud. 36, 265–277. https://doi.org/10.1177/0170840614559259

Bruijn, T. de, Lulofs, K., 2001. Promoting environmental management in Dutch SMES: policy implementation in networks. Presented at the Workshop Voluntary, Collaborative, and Information-Based Policies, Cambridge, MA USA.

Brunet, M., 2018. Governance-as-practice for major public infrastructure projects: A case of multilevel project governing. Int. J. Proj. Manag. https://doi.org/10.1016/j.ijproman.2018.02.007

Brunet, M., Aubry, M., 2016. The three dimensions of a governance framework for major public projects. Int. J. Proj. Manag. 34, 1596–1607. https://doi.org/10.1016/j.ijproman.2016.09.004

Brunke, J.-C., Johansson, M., Thollander, P., 2014. Empirical investigation of barriers and drivers to the adoption of energy conservation measures, energy management practices and energy services in the Swedish iron and steel industry. J. Clean. Prod. 84, 509–525. https://doi.org/http://dx.doi.org/10.1016/j.jclepro.2014.04.078

BSA Workshop, 2018. Practice theory: connections and methodologies, in: Regional Postgraduate Events. Lancaster University.

Cabinet Office, 2016. Cutting Red Tape home page [WWW Document]. Cut. Red Tape. URL https://cutting-red-tape.cabinetoffice.gov.uk/ (accessed 11.29.16).

Chatterton, T., 2011. An introduction to thinking about energy behaviour: A multi-model approach.

Chia, R., 2013. Paradigms and perspectives in organizational project management research: implications for knowledge-creation, in: Drouin, N., Müller, R., Shankar, S. (Eds.), Novel Approaches to Organizational Project Management Research: Translational and Transformational. Copenhagen Business Press, Copenhagen, Denmark, pp. 33–55.

Cooremans, C., 2011. Make it strategic! Financial investment logic is not enough. Energy Effic. 4, 473–492. https://doi.org/10.1007/s12053-011-9125-7

Crocker, R., 2012. SME Perceptions of Low Carbon Options: Drivers, Barriers and Business Sector Differences. Earth Environ. 7, 232–259.

Crosbie, T. (Tracey), Guy, S. (Simon), 2008. En'lightening' energy use: the co-evolution of household lighting practices. Int. J. Technol. Manag. 9, 220–235. https://doi.org/10.1504/IJETM.2008.019035

Cunliffe, A., Coupland, C., 2012. From hero to villain to hero: Making experience sensible through embodied narrative sensemaking. Hum. Relat. 65, 63–88. https://doi.org/10.1177/0018726711424321

DeCanio, S.J., 1998. The efficiency paradox: bureaucratic and organizational barriers to profitable energy-saving investments. Energy Policy 26, 441–454.

DeCanio, S.J., 1993. Barriers within firms to energy-efficient investments. Energy Policy 21, 906–914.

DECC, 2016. Potential of Smart Technologies in SMEs.

DECC, 2015. The Non-Domestic National Energy Efficiency Data-Framework: Energy Statistics 2006-12.

DECC, 2014. Research to Assess the Barriers and Drivers to Energy Efficiency in Small and Medium Sized Enterprises. DECC.

DEFRA, 2006. Encouraging Sustainability Amongst Small Businesses (Behaviour Change: A Series of Practical Guides for Policy-Makers and Practitioners No. 9).

Dickson, D., 2014. The People's Government: An Introduction to Democracy, The People's Government: An Introduction to Democracy. Cambridge University Press.

Energy Systems Catapult, 2017. Catapult aims to unleash SMEs with Innovator Toolkit.

Environment Agency, 2014. Climate change agreements: umbrella agreements [WWW Document]. URL https://www.gov.uk/government/collections/climate-change-agreements-umbrella-agreements (accessed 12.7.16).

ENWORKS, 2017. Low Carbon Network [WWW Document]. Green Growth. URL https://www.green-growth.org.uk/network (accessed 6.20.18).

European Commission, 2017. Good practice in energy efficiency.

European Commission, 2016. 2030 climate & energy framework [WWW Document]. Clim. Action - Eur. Comm. URL https://ec.europa.eu/clima/policies/strategies/2030_en (accessed 8.21.18).

European Commission, 2014. Development of Guidance on Extended Producer Responsibility (EPR) (No. 07.0307/2012/63260/ETU/C2).

European Commission, 2010. Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

European Commission, 2009. Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products, 285.

European Commission, n.d. ERDF England [WWW Document]. URL http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/united-kingdom/2014uk16rfop001 (accessed 1.11.17).

Feldman, M.S., Orlikowski, W.J., 2011. Theorizing Practice and Practicing Theory. Organ. Sci. 22, 1240–1253. https://doi.org/10.1287/orsc.1100.0612

Fleitera, T., Schleich, J., Ployplearn, R., 2012. Adoption of energy-efficiency measures in SMEs - An empirical analysis based on energy audit data. Energy Policy 51, 863–875.

Gram-Hanssen, K., 2010. Standby consumption in households analyzed with a practice theory approach. J. Ind. Ecol. 14, 150–165. https://doi.org/10.1111/j.1530-9290.2009.00194.x

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Hand, M., Shove, E., Southerton, D., 2005. Explaining Showering: a Discussion of the Material, Conventional, and Temporal Dimensions of Practice. Sociol. Res. Online 10, hand.

Hargreaves, T., 2011. Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. J. Consum. Cult. 11, 79–99. https://doi.org/10.1177/1469540510390500

Heseltine, M., 2012. No stone unturned: in pursuit of growth. Department for Business, Innovation and Skills.

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

High Level Group on Administrative Burdens, 2014. Cutting Red Tape in Europe.

HM Government, 2017. The Clean Growth Strategy: Leading the way to a low carbon future.

Horne, R., Strengers, Y., Strempel, A., 2016. Policing and polluting: The role of practices in contemporary urban environmental pollution governance. Environ. Sci. Policy 66, 112–118. https://doi.org/10.1016/j.envsci.2016.08.006

Hudson, S., Roloff, J., 2010. In search of sustainability? SMEs in Brittany, France, in: Ethics in Small and Medium Sized Enterprises. Springer, pp. 193–214.

IEA, 2015. Accelerating Energy Efficiency in Small and Medium-sized Enterprises, Policy Pathway.

Instinct and Reason, 2015. EEIG Program Evaluation Pre & post activity survey report. Energy Efficiency Information Grants Team, Department of Industry and Science, Sydney, Australia.

Janda, K., Wilson, C., Moezzi, M., Bartiaux, F., 2015. Improving efficiency in buildings: conventional and alternative approaches, in: Ekins, P., Bradshaw, M., Watson, J. (Eds.), Global Energy: Issues, Potentials and Policy Implications. Oxford University Press, Oxford, pp. 163–188.

Janda, K.B., 2014. Building communities and social potential: between and beyond organizations and individuals in commercial properties. Energy Policy 67, 48–55. https://doi.org/10.1016/j.enpol.2013.08.058

Janda, K.B., Bottrill, C., Layberry, R., 2014. Learning from the "data poor": Energy management in understudied organizations. J. Prop. Invest. Finance 32, 424–442.

Johnson, G., Langley, A., Melin, L., Whittington, R., 2007. Strategy as Practice: Research Directions and Resources. Cambridge University Press.

Keller, M., Halkier, B., Wilska, T.-A., 2016. Policy and Governance for Sustainable Consumption at the Crossroads of Theories and Concepts. Environ. Policy Gov. 26, 75–88. https://doi.org/10.1002/eet.1702

Köwener, D., Nabitz, L., Mielicke, U., al, et, 2014. Learning energy efficiency networks for companies - saving potentials, realization and dissemination, in: Eceee 2014 Industrial Summer Study on Energy Efficiency. Proceedings. pp. 91–100.

Kuijer, L., 2014. Implications of Social Practice Theory for Sustainable Design (PhD Thesis). Delft University of Technology.

Lewis, K., Cassells, S., 2010. Barriers and Drivers for Environmental Practice Uptake in SMEs: A New Zealand Perspective. Int. J. Bus. Stud. Publ. Fac. Bus. Adm. Ed. Cowan Univ. 18, 7.

Lizardo, O., 2004. The cognitive origins of Bourdieu's habitus. J. Theory Soc. Behav. 34, 375–401.

Lloyd, A., Olsson, M., 2018. Enacting and capturing embodied knowledge in the practices of enthusiast car restorers: Emerging themes. J. Librariansh. Inf. Sci. 0961000618769979. https://doi.org/10.1177/0961000618769979

Lomax, S., Parry, E., 2015. Micro and Small Business Engagement in Energy Markets. BMG Research.

Lutzenhiser, L., Janda, K., Kunkle, R., Payne, C., 2002. Understanding the response of commercial and institutional organizations to the California energy crisis. A report to the California Energy Commission - Sylvia Bender, Project Manager. Lawrence Berkeley Natl. Lab.

Mallaburn, P., 2016. A new approach to non-domestic energy efficiency policy.

Mariotti, F., Haider, S., 2018. "Networks of practice" in the Italian motorsport industry. Technol. Anal. Strateg. Manag. 30, 351–362. https://doi.org/10.1080/09537325.2017.1313401

MHCLG, BEIS, 2018. European Regional Development Fund and European Social Fund list of beneficiaries.

Mylan, J., Southerton, D., 2017. The Social Ordering of an Everyday Practice: The Case of Laundry. Sociology 003803851772293. https://doi.org/10.1177/0038038517722932

Narasimhan, K., Roberts, T., Xenitidou, M., Gilbert, N., 2017. Using ABM to Clarify and Refine Social Practice Theory, in: Advances in Social Simulation 2015, Advances in Intelligent Systems and Computing. Springer, Cham, pp. 307–319. https://doi.org/10.1007/978-3-319-47253-9_27

Naus, J., van der Horst, H.M., 2017. Accomplishing information and change in a smart grid pilot: Linking domestic practices with policy interventions. Environ. Plan. C Polit. Space 35, 379–396. https://doi.org/10.1177/0263774X16662470

Nicholls, C., 2014. Energy use in non-domestic buildings: the UK government's new evidence base. Build. Res. Inf. 42, 109–117. https://doi.org/10.1080/09613218.2014.832484

Nicolini, D., 2012. Practice Theory, Work, and Organization: An Introduction. Oxford University Press.

North, P., 2016. The business of the Anthropocene? Substantivist and diverse economies perspectives on SME engagement in local low carbon transitions. Prog. Hum. Geogr. 40, 437–454. https://doi.org/10.1177/0309132515585049

North, P., Nurse, A., 2014. "War Stories": Morality, curiosity, enthusiasm and commitment as facilitators of SME owners' engagement in low carbon transitions. Geoforum 52, 32–41. https://doi.org/10.1016/j.geoforum.2013.12.007

Nyman, M., 2016. DG GROW - The SME test in the European Commission.

Ofgem, 2017. Typical Domestic Consumption Values [WWW Document]. URL https://www.ofgem.gov.uk/gas/retail-market/monitoring-data-and-statistics/typical-domestic-consumption-values (accessed 6.20.18).

Orlikowski, W.J., 2002. Knowing in Practice: Enacting a Collective Capability in Distributed Organizing. Organ. Sci. 13, 249–273. https://doi.org/10.1287/orsc.13.3.249.2776

Paramonova, S., Thollander, P., 2016. Energy-efficiency networks for SMEs: Learning from the Swedish experience. Renew. Sustain. Energy Rev. 65, 295–307.

Pilerot, O., Lindberg, J., 2018. Inside the library: Academic librarians' knowing in practice. J. Librariansh. Inf. Sci. 0961000618769970. https://doi.org/10.1177/0961000618769970

Powells, G., Bell, S., Judson, E., Lyon, S., Wardle, R., Capova, K., Bulkeley, H., 2015. Fostering active network management through SMEs' practises. Energy Effic. 1–14. https://doi.org/10.1007/s12053-015-9382-y

Reckwitz, A., 2002. Toward a theory of social practices: a development in culturalist theorizing. Eur. J. Soc. Theory 5, 243–263.

Revell, A., Blackburn, R., 2004. SMEs and their response to environmental issues in the UK. Kingston Business School, Kingston University.

SBEN, n.d. Staffordshire Business & Environment Network [WWW Document]. sben. URL https://sben.co.uk/ (accessed 6.20.18).

Schaefer, A., Williams, S., Blundel, R., 2018. Individual Values and SME Environmental Engagement. Bus. Soc. 0007650317750134. https://doi.org/10.1177/0007650317750134

Schatzki, 2001. Introduction: practice and theory, in: Schatzki, T., Von Savigny, E. (Eds.), The Practice Turn in Contemporary Theory Eds Schatzki, Knorr Cetina, Von Savigny. Routledge, London, pp. 1–14.

Schatzki, T., 2016. Practice theory as flat ontology, in: Spaargaren, G., Weenink, D., Lamers, M. (Eds.), Practice Theory and Research: Exploring the Dynamics of Social Life. Routledge, pp. 28–43.

Schatzki, T., 1996. Social Practices: A Wittgensteinian Approach to Human Activity and the Social. Cambridge University Press.

Scottish Power, 2016. Survey Reveals SMEs Missing Out On Energy Savings [WWW Document]. URL https://www.scottishpower.co.uk/small-business/news/carbon-trust-partnership (accessed 11.30.16).

Shove, E., 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. Environ. Plan. A 42, 1273–1285. https://doi.org/10.1068/a42282

Shove, E., 2003. Converging conventions of comfort, cleanliness and convenience. J. Consum. Policy 26, 395–418. https://doi.org/10.1023/A:1026362829781

Shove, E., Pantzar, M., 2005. Consumers, producers and practices: understanding the invention and reinvention of Nordic walking. J. Consum. Cult. 5, 43–64. https://doi.org/10.1177/1469540505049846

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Simon, H.A., 1955. A Behavioral Model of Rational Choice. Q. J. Econ. 69, 99–118. https://doi.org/10.2307/1884852

Sorrell, S., Mallett, A., Nye, S., 2011. Barriers to industrial energy efficiency: A literature review (Working Paper No. 10/2011). United Nations Industrial Development Organisation.

Sorrell, S., Schleich, J., Scott, S., O'Malley, E., Trace, F., Boede, U., Ostertag, K., Radgen, P., 2000. Barriers to Energy Efficiency in Public and Private Organisations.

Spaargaren, G., Weenink, D., Lamers, M., 2016. Practice Theory and Research: Exploring the dynamics of social life. Routledge.

Spence, L.J., 2007. CSR and small business in a European policy context: the five "C" s of CSR and small business research agenda 2007. Bus. Soc. Rev. 112, 533–552.

Spotswood, F., Chatterton, T., Tapp, A., Williams, D., 2015. Analysing cycling as a social practice: An empirical grounding for behaviour change. Transp. Res. Part F Traffic Psychol. Behav. 29, 22–33. https://doi.org/http://dx.doi.org/10.1016/j.trf.2014.12.001

Spurling, N., McMeekin, A., 2015. Interventions in practices: Sustainable mobility policies in England, in: Strengers, Y., Maller, C. (Eds.), Social Practices, Intervention and Sustainability: Beyond Behaviour Change. Routledge, London.

Stephenson, J., 2018. Sustainability cultures and energy research: An actor-centred interpretation of cultural theory. Energy Res. Soc. Sci. 44, 242–249. https://doi.org/10.1016/j.erss.2018.05.034

Stephenson, J., Barton, B., Carrington, G., Doering, A., Ford, R., Hopkins, D., Lawson, R., McCarthy, A., Rees, D., Scott, M., Thorsnes, P., Walton, S., Williams, J., Wooliscroft, B., 2015. The energy cultures framework: Exploring the role of

norms, practices and material culture in shaping energy behaviour in New Zealand. Energy Res. Soc. Sci. 7, 117–123. https://doi.org/10.1016/j.erss.2015.03.005

Stephenson, J., Barton, B., Carrington, G., Gnoth, D., Lawson, R., Thorsnes, P., 2010. Energy cultures: A framework for understanding energy behaviours. Socio-Econ. Transit. Hydrog. Econ. - Find. Eur. Res. Regul. Pap. 38, 6120–6129. https://doi.org/10.1016/j.enpol.2010.05.069

Sustainability West Midlands, 2017. Fit for the Future? II: Local Enterprise Partnerships' Climate Change and Low Carbon Economy Good Practice.

Trianni, A., Cagno, E., 2012. Dealing with barriers to energy efficiency and SMEs: Some empirical evidences. 7th Bienn. Int. Workshop "Advances Energy Stud. 37, 494–504. https://doi.org/10.1016/j.energy.2011.11.005

Trianni, A., Cagno, E., 2011. Energy Efficiency Barriers in Industrial Operations: Evidence from the Italian SMEs Manufacturing Industry. Energy Product. Ind. Partn. Oppor. 12.

Warde, A., 2005. Consumption and theories of practice. J. Consum. Cult. 5, 131–153.

Weick, K.E., 1995. Sensemaking in organizations, Foundations for organizational science. Thousand Oaks.

Weick, K.E., Sutcliffe, K.M., Obstfeld, D., 2005. Organizing and the Process of Sensemaking. Organ. Sci. 16, 409–421. https://doi.org/10.1287/orsc.1050.0133

Westrom, M., 2018. Bathing in Japan: Applying a practice theory vocabulary to energy use through ethnography. Energy Res. Soc. Sci. 44, 232–241. https://doi.org/10.1016/j.erss.2018.05.018

Whittington, R., 2006. Completing the Practice Turn in Strategy Research. Organ. Stud. 27, 613–634. https://doi.org/10.1177/0170840606064101

Wolff, A., Weber, I., Gill, B., Schubert, J., Schneider, M., 2017. Tackling the interplay of occupants' heating practices and building physics: Insights from a German mixed methods study. Energy Res. Soc. Sci., Energy Consumption in Buildings: 32, 65–75. https://doi.org/10.1016/j.erss.2017.07.003

3. METHODOLOGY

This chapter describes the methods used and explains the rationale for the methodological approach taken in pursuit of answering the thesis' central research question. It begins in Section 3.1 by describing the practical details involved in conducting this three-year research project. Section 3.2 then outlines and justifies the scope covered by the empirical chapters. Section 3.3 discusses the methodological implications of using practice theory in empirical research. Drawing on recent contributions in the literature, Section 3.4 justifies the use of interviews, ethnographic methods and case studies in the five papers; and discusses the merits and pitfalls of an alternative methodological approach. Section 3.5 summarises the chapter.

3.1 PRACTICAL DETAILS

This project is funded under Phase 3 of the UK Energy Research Centre (UKERC), and is part of a larger research programme. UKERC's 2014-2019 work programme is structured into six 'themes' and my Studentship has been funded under Theme 5: Decision Making, as part of a sub-project entitled 'energy practices and energy services'. Consequently, practice theory has featured prominently from the start of this research project, and the first written output was developed for the DEMAND conference at Lancaster University, where this tradition was widely discussed (Hampton, 2016). This conference paper was subsequently developed for submission to *Energy Research & Social Science,* and was published in April 2017. It is included as Paper 1 in this thesis.

Over the course of my first year, my interest moved away from the concept of energy services toward the issues addressed in another UKERC Theme 5 project called 'investment

by decentralised actors', which examines SME energy consumption, efficiency investments and associated policy. Building on my prior experience of working with SMEs, I developed plans for three further empirical studies. Papers 2-4 were designed to investigate governance practices spanning a range of spatial scales, drawing on longitudinal data derived from professional experience and pre-existing relationships (see Table 3-1 and Table 3-2 for visual representations of the temporal and spatial scales covered by each paper).

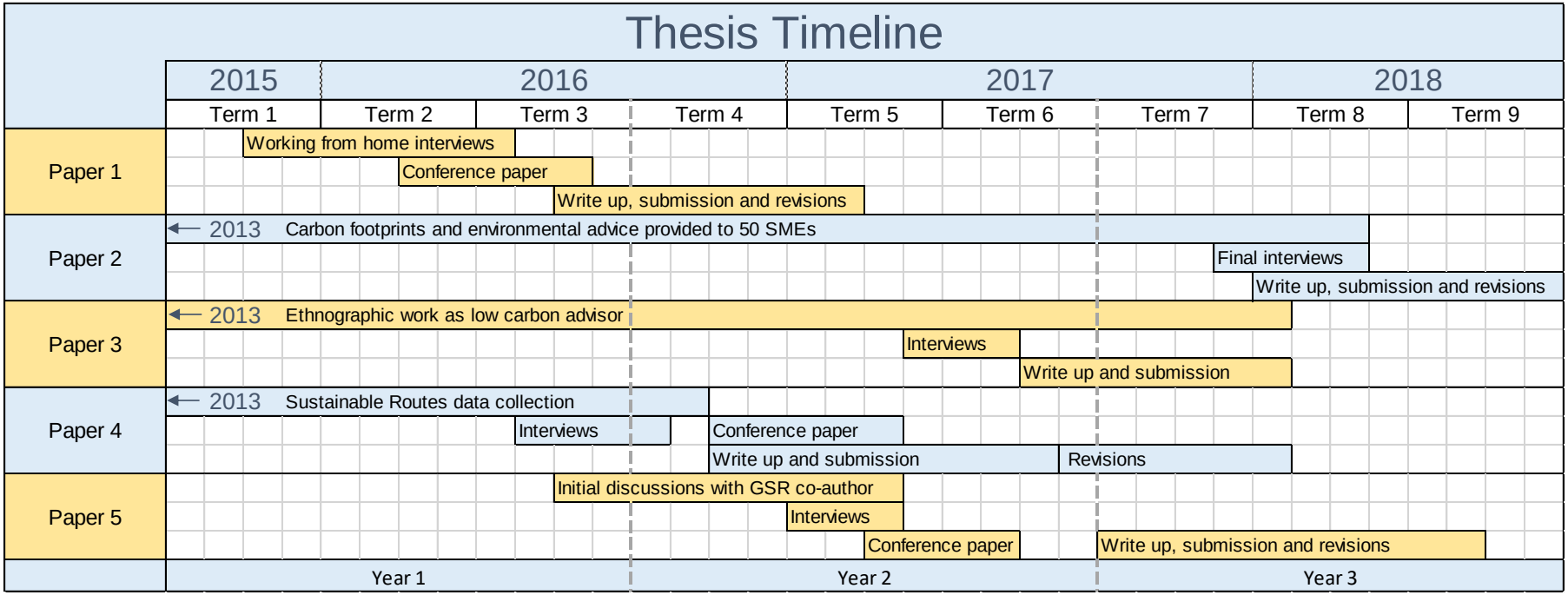
Paper 5 was an unforeseen project, initiated following a visit to our research group from Government Social Researchers (GSRs) based at the Department for Energy and Climate Change (DECC). Surprised by our visitors' familiarity with practice theory, I took the opportunity to collaborate with a GSR to investigate how different social theories are presented to, and taken up by, policy-makers. The position of my co-author as a GSR gave unique access to others working on energy and climate within central government, whom we interviewed to garner insights into the intellectual standoff between behavioural economics and practice theory. With the addition of this paper at the start of year two, the structure of the thesis and the precise wording of its research question began to take shape.

Table 3-1 depicts the work-flow of the research over three years. It shows that the first three papers include data collected prior to the start of the DPhil, supplemented with interviews conducted between Term 3 and Term 8. Papers 1, 4 and 5 each benefitted from feedback received at international conferences where early drafts were presented (DEMAND, 2016; BEHAVE, 2016; and ERSS, 2017 respectively). An additional conference paper describing the various challenges of generating and implementing energy policy for SMEs

was presented at ECEEE 2017; a piece of work which has helped to develop the thesis as a whole (Hampton and Fawcett, 2017).

Ethical permission for all methods used was granted by the Central University Research Ethics Community of the University of Oxford. All participant data has been anonymised, and is held on secure servers only accessible by members of our research group (Lower Carbon Futures). No significant methodological challenges were encountered in this research. Conversely, this research has benefited from privileged access to practitioners in a variety of settings. That said, the initial findings in Paper 5 were interpreted as controversial by the participant community. Despite their anonymity being preserved, some GSRs felt the small sample size of the study would reveal their sometimes-not-impartial stance on different schools of social science. The concluding chapter of this thesis reflects on how this research has relied on privileged access to data and participants, and describes how in the case of Paper 5, my co-author and supervisors helped to navigate the 'member checking' process (Bradshaw, 2001).

Table 3-1 - Timeline showing when the major tasks for each of the five papers was conducted.



3.2 EMPIRICAL SCOPE

The geographical scope of this research is the UK. However, given the multi-level nature of SME energy and environmental governance, the focus is not on the national scale alone. References are made to the role of supranational institutions such as the European Commission in setting the priorities and objectives for ERDF funding (Paper 4), as well as the regional and local scales where programmes and projects are managed and implemented (Papers 3 and 4), and where SME practices (Papers 1 and 2) are embedded (Eadson, 2014).

An alternative option would have been to focus on a larger region such as Europe, where comparisons of how different EU member states were implementing SME energy and environmental policies would have yielded fascinating results. However, in focusing on larger scale governance practices, the important micro-level practices which influence energy demand at the level of the organisation and the household would be neglected.

Another option would have been to investigate the topic of governance more intensively at the regional scale, generating more in-depth insights into the principal level at which energy and environmental policy is administered. However, this would downplay the role of national government in shaping the policy agenda. Nor would this do enough to acknowledge the cultural, social and material boundaries which are sustained at the scale of the nation-state, and which provide the context for what Schatzki calls the 'plenum' of practices (Schatzki, 2016).

Although focused on the UK alone, the range of scales and governance practices investigated is notably broad. As indicated in Chapter 1, this is primarily to reflect the wide variety of actors with influence over how energy is used and managed by SMEs in

the UK. Table 3-2 describes how each paper addresses governance practices at distinct geographical and administrative scales. The exception to this scalar delineation is Paper 4. This study focuses primarily on a regional case study, but by 'zooming in' (Nicolini, 2009) on Sustainable Routes' implementation practice, it demonstrates how the activities of different institutional actors became entwined with one another through meanings, materials and competences.

Table 3-2 - Depiction of the governance practices, at different scales, analysed in each empirical paper.

	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5
National scale				DCLG oversight of ERDF governance, including producing and interpreting guidance documentation.	The practices of government social research and the policy-research interface.
Regional scale			The provision of low carbon advice to SMEs.	Project management; grant awarding advice giving; risk management.	
Level of the firm		Energy management practice; knowledge production; advice giving.		Compliance with rules; behaviour change.	

Individual scale	Working from home; managing personal comfort.				

Such a broad scope is unusual for empirical research drawing insights from practice theory. There is a tendency for studies in this tradition to focus on micro-phenomena, as a way to trace the dynamics of practice-elements, and the subtle, iterative ways in which practices change over time and space (Nicolini, 2016; Spaargaren et al., 2016). However, as efforts to render practice theory more relevant and applicable to 'real-life puzzles' accelerate (Arts et al., 2013), theoretical developments have explored the potential for practice theory to be used to address large-scale phenomena, such as policy governance (Nicolini, 2016, 2009). Nicolini, for example, suggests that researchers 'switch' theoretical lenses in the course of their empirical work, beginning with ethnographic methods to investigate the micro-dynamics of practices, before 'zooming-out' to reflect on how the practice in focus affects, and is affected by, the wider plenum of practices (Nicolini, 2009, 2012). This metaphor loosely applies to this thesis itself. While the research project as a whole seeks to contribute towards the effective design and implementation of energy and environmental policy and governance for SMEs, each empirical paper 'zooms in' on a particular set of relevant practices, demonstrating the value of practice theory at different scales.

3.3 PRACTICE THEORY AND METHODOLOGY

Whether practice theory makes particular methodological demands on researchers is a question of continued debate (Hui and Schäfer, n.d.; Arts et al., 2013; Spaargaren et al., 2016). Tracing its roots to Bourdieu's ethnographic fieldwork in Algeria which led to

Outline of a Theory of Practice (1977), Schmidt (2016) argues that praxeology has a 'negative epistemology'. He explains how Bourdieu sought to move away from the positivist tradition whereby the validity of a theory is tested through empirical observation, instead developing an approach in which theory and empiricism permeate one another. Schmidt uses the example of the practice of academic writing to demonstrate that ideas in academic texts are not merely transcribed through writing, but emerge and are inseparable from the processual and situational dimensions of this performance. The resulting epistemology is necessarily preliminary in nature, acknowledging the power of analytical research to *construct*, rather than simply observe, social practices. For Schmidt, this epistemology makes methodological demands on researchers, yet resists the possibility that an empirical toolkit could be created. Instead, open, qualitative, ethnographic methods allow for researchers to adapt their focus to the 'temporal and spatial dynamics of streams of practices' (Schmidt, 2016, p. 51).

Practice theory's relationship with empirical research is a topic of contemporary debate, and in 2016 Hui and Schafer created a website dedicated to this discourse (Hui and Schäfer, n.d.). The site launched with seven 'propositions' to initiate debate (see Figure 3-1). These largely resonate with Schmidt's observations about the suitability of adaptive, qualitative methodologies for attending to the spatial, temporal and embodied aspects of practice. They also take heed of Nicolini's arguments for practice theory to be able to comment on large scale phenomena.

1. Established methods offer both opportunities and dangers for working with practice theories.
2. Practice theories make specific methodological demands of those who work with them.
3. Considerations of space, time and embodiment are essential aspects of practice theory methodologies.
4. Inventive and multiple methods, units, samples, etc. are particularly useful for exploring practices at different scales, in relation to changing social patterns and variably interconnected actors.
5. Practice theoretical methodologies need to be able to capture macro structures or large scale phenomena.
6. Practice theoretical methodologies always have to adapt to the field of practice they are studying.
7. Practice theory is a conceptual framework which is particularly susceptible to change. It is shaped by its empirical findings.

Figure 3-1 - 'Propositions for discussion' raised on the *Practice Theory Methodologies* website (Hui and Schäfer, n.d).

In her contribution to the website entitled 'practice theory methodologies do not exist', Elizabeth Shove added an eighth proposition which takes an epistemologically liberal stance (2017):

8. Taking "practice" as a central conceptual unit of enquiry generates a range of distinctive questions. The choice of methods depends on which of these questions you want to take up and pursue. Using practice theory is thus not directly tied to certain methods, but the choice of methods is – as always – dependent upon your specific research question.

Figure 3-2 - An eighth proposition proposed for discussion by Elizabeth Shove, on the *Practice Theory Methodologies* website (Shove, 2017).

This philosophically liberal stance is somewhat uncharacteristic of Shove, as she has also been a vocal critic of studies which have applied unconventional methods to investigate practices. In a recent talk for example (BSA Workshop, 2018), she criticised Higginson et al's (2015) attempt to quantify and diagrammatically map elements of laundry practice using network analysis, as well as Kuijer's (2014) efforts to integrate numerical energy consumption values into the 'three-element model' of practice theory. Quantification and modelling, she suggested, were in danger of reifying practice-elements; losing the dynamism embodied in the three-element model. Notwithstanding their debatable limitations, the advice provided in Shove's 8th proposition appears consistent with such methodological experiments. Like the research in this thesis, Higginson et al and Kuijer share the ambition to generate policy-relevant findings using a practice perspective, and are responding to a 'specific research question' which asks how practice-informed findings can be made palatable for mainstream policy discourse. These theoretical experimentations and the debate they generate help to develop and refine practice theory's relationship with epistemology.

Although Schmidt claims that the nature of praxeology's epistemology means that a toolkit for empirical research cannot be produced, this has not stopped others from attempting to do so, albeit in broad terms. Motivated by the desire to engage in mainstream discourse on forest and nature governance for example, Arts et al (2013) produced six 'methodological guidelines' following a review of practice theory literature (Figure 3-3).

1. Practice is the 'unit of analysis'.
2. Research interest starts with a 'real-life' puzzle or surprise that generates key research question.
3. Reasoning is iterative (continuous iteration between research questions, theory and empirics).
4. In-depth case studies and thick descriptions are prioritised over large-scale, one-shot surveys and formal statistical modelling.
5. Qualitative and/or quantitative techniques and data are used (within the context of an interpretive methodology).
6. Science itself is a social practice (complex, practical, performative), so there is a need for reflection on trustworthiness and accountability.

Figure 3-3 - Arts et al's six methodological guidelines for empirical research using a practice based approach (2013).

Despite the ongoing theoretical controversies discussed above, these guidelines provide practical assistance for researchers interested in using practice theory to investigate 'real-life puzzles.' Concerned with accelerating the UK's transition to a low carbon economy, the empirical studies in this thesis each adhere to these, opting for qualitative methods in the form of semi-structured interviews, ethnography, auto-ethnography, and case studies. The following section discusses the use of each of these methods in turn.

3.4 IMPLICATIONS, JUSTIFICATION AND LIMITATIONS OF THE METHODS USED IN THIS THESIS

The principal research methods used in this thesis are interviews, ethnography and case studies. This section discusses the implications of selecting these methods, justifies their use and summarises their limitations. It then discusses what an alternative option of using quantitative methods to investigate practices would have involved, and what this implies for the approach chosen.

3.4.1 INTERVIEWS

Interviews are widely used in empirical studies of energy demand using practice theory. However, interview data are not wholly unproblematic, and there has been recent debate over their primacy as a means for investigating practices.

Hitchings (2012) identifies researchers who have moved away from relying on interviews for their practice-focused empirical work, responding in part to work in human geography seeking to move beyond the notion of representation (Thrift and Dewsbury, 2000; Cresswell, 2012). McCormack, for example, found that conventional descriptions of dance failed to capture the kinaesthetic, affective nature of the practice, and he began to experiment with alternative and creative means of representation (McCormack, 2003). The rationale for these moves is based on a scepticism about the ability of practitioners to have complete and unblemished insight into their own practices, nor be able to fully articulate their experience. There are parallels here with practice theory, which de-centres the individual and gives prominence to material, technological and cultural elements (Reckwitz, 2002), as well as embodied forms of knowledge (Wallenborn and Wilhite, 2014). For Hitchings however, disregarding the reflexive power of individual practitioners is foolhardy. He argues that careful and thoughtful interviewing techniques can generate unparalleled insights into social practices, and calls for researchers to persist with qualitative interviews. Hitchings nonetheless acknowledges their limitations and provides some guidance for qualitative researchers. This includes being willing to ask mundane, seemingly obvious questions which often uncover surprising elements of practice; asking hypothetical questions to reveal the logic behind what sustains activities; and attending to the signals of body language.

Citing the work of Margaret Archer, Bonnington (2015) also defends the use of interviews as providing indispensable insight into practices. He uses the example of domestic energy efficiency retrofit practices to show that the 'internal conversation' of the householder remains of fundamental importance. Understanding why certain projects are preferred to others, or how comfort relates to other practices for householders, can only be achieved through open conversations with practitioners. Like Hitchings however, Bonnington uses interviews with caution, supplementing verbal accounts with observations of how energy efficiency technologies are 'domesticated' into the household. Rather than positing reflexivity and individual agency in opposition to a practice perspective, he demonstrates that individuals' explanations of their activities can uncover the role of materials, and of embodied and practical knowledge in these processes.

Incorporating the guidance provided in the literature cited above, interviews are used throughout the empirical chapters which follow. However, in the course of this research, two general challenges were encountered which revealed the limitations of interview data and the need for supplemental methods. These are discussed in turn.

3.4.1.1 PRACTITIONERS, CARRIERS OR NEITHER? THE CHALLENGE OF INTERVIEWING RELUCTANT PRACTITIONERS

Nicolini (2016) posits that in many cases, respondents crave the opportunity to discuss their practices, 'thirsty' for hints and tips, and an outsider's perspective. However, not all practices are discrete and well-bounded, nor do practitioners always identify themselves as active carriers. Two of the papers in this thesis encounter this phenomenon. Paper 4 sets out to understand the interlinked practices involved in policy implementation, using a case study of a regional sustainable transport project. However, each individual

participant interviewed for this paper played only a small part in the project's overall implementation, and it became clear that interviewees did not identify themselves as implementation practitioners, but as administrators, managers and civil servants, and were focused on their own responsibilities and practice-remit. The three-element model was used to help elicit reflexive insights from interviewees, and to collaboratively articulate how their professional practices overlapped with the practice-bundle of Sustainable Routes' implementation. In the paper, the picture of policy implementation as a practice-bundle emerges out of the *collection* of interview data, which are supported by documentary evidence and auto-ethnographic insights. Using mixed-methods and a multi-sited dataset to triangulate its findings, this paper demonstrates the potential for practice theory to be used to analyse large scale phenomena.

Focusing on energy management practice in three SMEs, Paper 2 also encounters reluctant practitioners. Interviews with managers reveal that although energy is consumed, conserved and wasted as part of everyday business practice, they give little thought to energy management. Rather than be put off by the managers' reluctance to be considered practitioners of energy management, this stance is used as an opportunity to observe the learning processes by which information about energy use and environmental impact is absorbed into the doings and sayings which constitute an organisation. Interviews are supplemented by carbon footprints, involving several site visits and ongoing discussion with managers; and auto-ethnographic reflections on the longitudinal relationships developed as an energy and environmental advisor. Sensitive analysis of findings reveals *sensemaking* processes, as individuals interpret the results of the carbon footprint assessments, reconciling this technical report with their own lived experience as well as existing organisational narratives.

It is perhaps unsurprising that the challenge of interviewing reluctant, ambivalent practitioners is encountered in the empirical research for this thesis, given its exploratory use of practice theory in the field of SME energy and environmental governance. However, if the value of practice theory is to extend beyond well-defined and identifiable practices, to contribute to tackling the more complex structures and norms which drive energy demand and underpin its governance, such methodological experimentation is necessary.

3.4.1.2 WHEN WORDS FAIL

One of the distinguishing features of practice theory is that practices involve a variety of material elements, and that knowledge has both cognitive and embodied dimensions (Reckwitz, 2002). Although many methodological scholars advise against interpreting interview data as objective truth (Schaffer, 2006; Bryman, 2012; Brinkmann, 2013), this is particularly true for research using practice theory. Investigating the relationship between working from home and energy, Paper 1 observes that for most participants, the interview was the first time they had verbalised, or even consciously considered, their habits when working from home. Unlike participants in Papers 2 and 4, interviewees readily identified themselves as practitioners of working from home. Nonetheless, in the staged setting of the semi-structured interview, they sometimes struggled to articulate aspects of their experience, particularly in relation to comfort. The paper uses non-representational theory and the notion of affect to reveal elements of working from home practice which would not have been uncovered with more conventional, linguistically dominant qualitative methods.

It has been recently pointed out that, compared with sociology in particular, geographers have contributed less to the growing field of social scientific energy research, nor have

they widely adopted or developed practice theory (Calvert, 2016; Reid and Ellsworth-Krebs, 2018). Therefore, a secondary aim of Paper 1 is to demonstrate the value of ideas developed in cultural geography to the energy research community, and to articulate the synergies between affect and practice theory for the relatively siloed communities of geographers and sociologists.

3.4.2 ETHNOGRAPHY AND AUTO-ETHNOGRAPHY

Ethnographic methods are used in each of the five papers in this thesis. In his book '*Doing Ethnography*', Gobo (2008) says that the meaning of the term 'ethnography' has become so diluted as to become synonymous with qualitative studies in general. He suggests that its popularity is partly due to its esoteric and unstructured methodology. Compared with surveys or structured interviews, ethnography is relatively opaque; its validity cannot be evaluated by reproduction, but through the strength, resonance and plausibility of its findings (Flyvbjerg, 2001).

While it may be criticised by some as unscientific and lacking in rigour, for others, its flexibility is a strength (LeCompte and Goetz, 1982). Flyvberg (2001) is particularly fervent in his defence of qualitative methods including ethnography, arguing that social scientific work is too often assessed along the same lines as the explanatory and predictive theories of the natural sciences. Using Aristotelian terms, he contrasts 'episteme', which describes the context-independent, generalising nature of scientific knowledge, with 'phronesis', which encapsulates practical knowledge, experience and ethics. Envisioning a more 'phronetic' social science which defines success on its own terms, he calls for researchers to help elucidate 'where we are, where we want to go, and what is desirable' (Flyvbjerg, 2001, p. 167).

Anderson (2006) also writes in defence of ethnographic fieldwork, discussing the value and potential of auto-ethnography. Outlining five principles of 'analytic auto-ethnography' (listed and discussed in Chapter 7, Table 7-1), his contribution helps to open up the scope of what is considered evidence in qualitative research. He argues that auto-ethnography is particularly valuable in studies of professions, pointing to a long tradition of sociologists reflecting on their working experiences. These include Ralph Turner's account of Navy Disbursing Officers as street-level bureaucrats during WWII (1947), and Fred Davis's analysis of the power dynamics between the big-city taxicab driver and his fare (1959).

Exploring the potential of practice theory to inform governance processes, this thesis relies on ethnographic methods to provide in-depth accounts of practices, including their internal constitution (e.g. constellations of elements) and relational dynamics (e.g. as bundles). As highlighted by Schmidt, ethnography and auto-ethnography are aligned with practice theory's *epistemology* due to the unfolding, emergent nature of practices; and with its *ontology*, given their tacit and embodied dimensions (2016).

The papers in this thesis each use ethnographic methods in slightly different ways, and a summary is provided in Table 3-3. These include auto-ethnographic reflections on professional experience retrospectively (Papers 3 and 4); concurrently (Papers 1, 2, 3 and 5), and through participant observation (Paper 1).

Table 3-3 - Summary of the different ethnographic techniques used in each empirical paper.

Paper 1	Participant observation and auto-ethnographic reflections when working from home.
Paper 2	Reflections on long term relationships built with three SMEs, and the provision of energy and environmental advice.
Paper 3	Retrospective reflections combined with ongoing work as a business advisor. Journal entries, email exchanges and carbon footprint assessments for SMEs used as data.
Paper 4	Retrospective reflections on two years' experience as Project Manager on Sustainable Routes, as part of the coalition of actors implementing the project. Personal diary entries are included.
Paper 5	Auto-ethnographic reflections provided by co-author on their experience as a civil servant.

Using ethnographic methods demands critical reflexivity on the part of the researcher (Anderson, 2006). Prior to starting this research project, I worked as an environmental consultant, first for large corporations (2008-2013), and later (2013-2015) as the Project Manager on Sustainable Routes (see Paper 4). From the start of the second year of this research project, I took on a role with the Oxfordshire Local Enterprise Partnership as a low carbon advisor for SMEs, one day per week.

Papers 2, 3 and 5 all capitalise on my privileged position as a business advisor, and Paper 5 takes advantage of my co-author's professional experience as a civil servant. In each case, having 'complete member status' (Anderson, 2006) provided the experience, knowledge and language with which to relate to participants. Crucially, this also granted *access* to key practitioners within governance institutions. Sharing personal experiences, frustrations and even advice permitted insights into professional practices which would not have been achieved if the researcher had been an 'outsider'.

As well as helping to facilitate the empirical research in this thesis, my professional background and ongoing interest in environmental and energy related business support colours my approach to academic research. Motivated by the desire to deliver tangible reductions in energy demand and greenhouse gas emissions from SMEs, my position may be described to some extent by the principles of 'action-research', in which the research practitioner addresses their subjects not only with an interest in *describing* practices and phenomena, but shaping and influencing outcomes (Denscombe, 2014; discussed further in Paper 2). This has implications for the way that practice theory is deployed in this thesis. Developing ways to apply insights from social science to 'real-world' governance questions is a thread running through each paper. While the research question places practice theory at the centre of the picture, the main motivation is not to develop the theory for its own sake, but to address the challenges involved in the SME energy transition. It is hoped that in pursuit of this goal, the novel applications of practice theory in the field of SME energy and environmental governance help to prove and extend its value.

3.4.3 CASE STUDIES

Papers 2 and 4 in this thesis opt for case studies as a way of 'examining the global in the local' (Nicolini, 2016, p. 108). According to Yin (1994), case studies are appropriate when (1) the boundaries between a contemporary phenomenon and its context are not clearly defined; and (2) there are multiple sources of evidence and many variables which cannot be 'controlled'. He also suggests that case studies benefit from the 'prior development of theoretical propositions to guide data collection and analysis' (1994, p. 13). Yin's principles neatly describe the empirical approach taken in Paper 4. Given the multi-actor, multi-scalar nature of regional SME energy policy implementation, the

researcher is compelled to 'zoom in' on particular projects if meaningful, in-depth insights into implementation practice are to be found. Multiple sources of data are used to develop a comprehensive account of the implementation of Sustainable Routes, including documentary analysis, diary entries and interviews with a diverse set of actors. The resulting narrative offers a glimpse into the interwoven practices of implementation practitioners, sometimes sharing, sometimes exchanging elements such as risk, stress and legalese.

The pursuit of depth is also the rationale for using case studies in Paper 2. Whereas a large quantity of literature on energy management and efficiency investments in SMEs use survey data to identify drivers and barriers to reducing demand, this study seeks a deeper understanding of how and why energy is consumed, managed and conserved in organisations. Case studies are used to describe and reflect on processes of sensemaking and co-fabricated knowledge construction for an accountancy firm, a charity and a retailer/manufacturer.

3.4.4 QUANTIFYING PRACTICES: EXPLORING AN ALTERNATIVE METHODOLOGICAL OPTION

This research uses qualitative methods to investigate a range of practices relating to SME energy and environmental governance. However, the development of energy and environmental policy in the UK is influenced most strongly by physical, technical and economic (PTE) principles, and policy-makers are most likely to use research which is able to demonstrate reproducible, statistically significant findings (Wilson et al., 2015; Cooper, 2017). Given that this research aims to make SME energy and environmental governance

more effective and seeks to engage in policy discourse, this observation casts doubt over the methodological choices described in the previous sub-sections.

Despite its natural affiliation with qualitative methods, recent studies have experimented with using quantitative methods for practice-based research. For example, Higginson and colleagues (2015, 2014) explore the potential to integrate practice theory into quantitative models and lay the groundwork for it to enter mainstream policy discourse. Narasimhan et al (2017) extend these efforts by developing an agent-based model in which the problem of structure and agency is played out in simulations of household practices. These approaches provided inspiration in the early stages of planning this research project, particularly given the opportunity to share an office with Sarah Higginson and Philip Grunewald. While not designed with practice theory at its centre, Grunewald's METER project (2015) is producing a wealth of information on household energy consuming activities and associated electricity demand. There is potential for this data to be used in conjunction with practice theory to quantify the temporal and spatial dynamics of electricity demand and even to test the effects of interventions which alter key elements of practice. Whereas the papers in this thesis opt for in-depth, qualitative approaches, using quantitative techniques may have led to greater policy impact. This was made clear to me when talking with a GSR at the 2016 BEHAVE conference about my recently completed paper on working from home. Interested in the findings, he asked which methods were used and what the sample size was. I explained that there had been 20 participants and that ethnographic methods were used. While intrigued by my explanation of the findings, conclusions and the use of practice theory in the paper, he explained that his role required him to focus on using studies with larger samples and reproducible outcomes.

The opportunities associated with quantifying and modelling practices come with their disadvantages too. For example, data collection on the METER project has proven to be resource-intensive, slower than anticipated, and requires advanced programming skills. Quantitative analyses of practices also tend to sacrifice depth in favour of breadth (Higginson et al., 2015; Narasimhan et al., 2017). For energy demand in domestic settings (the focus of Higginson, Narasimhan and Grunewald's work), there is already a wealth of qualitative analysis and practice-based literature offering in-depth insights which complement their efforts to quantify practices. However, research on SMEs and energy is substantially less developed, particularly with respect to practice theory. Therefore, while quantification may prove to be a key method by which practice theory enters policy discourse, for the topic of SME energy and environmental governance, it would be a question of running before walking.

Although not the primary means of investigation, quantitative analysis *is* used in Papers 2 and 3, in the form of carbon footprint assessments. In Paper 2, calculating the total annual greenhouse gas emissions from three SME produced a close understanding of how energy was consumed, conserved and managed. In Paper 3, experience of conducting carbon footprint assessments provided first-hand experience of the challenges involved in providing low carbon business support. Assessing an SME's operational emissions requires an understanding of a variety of methodological principles which are designed primarily for large corporations. Dealing with the purchase of green electricity, or avoiding double-counting the use of recycled materials and the recycling of end-use products is not straightforward, and reveals just one of the challenges faced by advisors.

To observe that most policy-influential research is quantitative is not to say that qualitative research cannot achieve significant impact on energy and environmental governance practices. Paper 5 addresses the question of how social theory is used by practitioners of social scientific research in government, finding that the community of GSR practitioners working on energy and climate are open-minded and internally influential. This is a critical audience for those in the social sciences wishing to engage with traditional governance institutions and the discourses therein. While ethnographic studies rarely feed *immediately* and *directly* into policy development, the findings, discussions and conclusions of the papers in this thesis each identify insights worthy of further investigation. These represent potential pathways for future research to be more seamlessly integrated into policy and governance practice. As my conversation with the GSR testifies, the papers may not be readily suited for policy processes, but nonetheless spark interest and help to draw attention to how applications of practice theory can support the SME energy transition.

3.5 CONCLUSIONS AND CHAPTER SUMMARY

The methods used in this thesis largely fall within the established qualitative traditions of the social sciences. However, conducting empirical research using practice theory as a principal theoretical framework raises challenging questions relating to interviewee reflexivity, researcher positionality, and even the fundamental relationship between theory and empiricism. These questions are the subject of contemporary debate, and this chapter has reviewed recent theoretical literature which helps to guide and justify the methodological choices made in this thesis.

This chapter summarised the practical details involved in conducting this research, and explained the rationale for its empirical scope. It described the principal methods used in

the papers, reflecting on their strengths and limitations, and discussed the merits and pitfalls of an alternative approach.

3.6 REFERENCES

Anderson, L., 2006. Analytic Autoethnography. J. Contemp. Ethnogr. 35, 373–395. https://doi.org/10.1177/0891241605280449

Arts, B., Behagel, J., Bommel, S. van, Koning, J. de, Turnhout, E. (Eds.), 2013. Forest and Nature Governance: A Practice Based Approach, World Forests. Springer Netherlands.

BEHAVE, 2016. 4th European Conference on Behaviour and Energy Efficiency. Presented at the BEHAVE, Coimbra, Portugal.

Bonnington, O., 2015. The Indispensability of Reflexivity to Practice: The Case of Home Energy Efficiency. J. Crit. Realism 14, 461–484. https://doi.org/10.1179/1572513815Y.0000000009

Bourdieu, P., 1977. Outline of a Theory of Practice. Cambridge University Press.

Bradshaw, M., 2001. Contracts and member checks in qualitative research in human geography: reason for caution? Area 33, 202–211. https://doi.org/10.1111/1475-4762.00023

Brinkmann, S., 2013. Introduction to Qualitative Interviewing, in: Qualitative Interviewing. New York: Oxford University Press.

Bryman, A., 2012. Social research methods, 4th ed. ed. Oxford: Oxford University Press.

BSA Workshop, 2018. Practice theory: connections and methodologies, in: Regional Postgraduate Events. Lancaster University.

Calvert, K., 2016. From "energy geography" to "energy geographies": Perspectives on a fertile academic borderland. Prog. Hum. Geogr. 40, 105–125. https://doi.org/10.1177/0309132514566343

Cooper, A.C.G., 2017. Building physics into the social: Enhancing the policy impact of energy studies and energy social science research. Energy Res. Soc. Sci. 26, 80–86. https://doi.org/10.1016/j.erss.2017.01.013

Cresswell, T., 2012. Nonrepresentational Theory and Me: Notes of an Interested Sceptic. Environ. Plan. Soc. Space 30, 96–105. https://doi.org/10.1068/d494

Davis, F., 1959. The Cabdriver and His Fare: Facets of a Fleeting Relationship. Am. J. Sociol. 65, 158–165.

DEMAND, 2016. What energy is for: the making and dynamics of demand, in: What Energy Is for: The Making and Dynamics of Demand. Presented at the DEMAND, Lancaster University.

Denscombe, M., 2014. The Good Research Guide: For Small-scale Social Research Projects. McGraw-Hill Education (UK).

Eadson, W., 2014. Towards a spatially and socially embedded approach to SME support for carbon reduction. People Place Policy Online 8, 129–138. https://doi.org/10.3351/ppp.0008.0002.0004

ERSS, 2017. First International Conference on Energy Research and Social Science. Presented at the ERSS, Sitges, Spain.

Flyvbjerg, B., 2001. Making social science matter: why social inquiry fails and how it can succeed again. Cambridge: Cambridge University Press, Cambridge.

Gobo, G., 2008. Doing Ethnography. SAGE Publications Ltd, 1 Oliver's Yard, 55 City Road, London England EC1Y 1SP United Kingdom. https://doi.org/10.4135/9780857028976

Grunewald, P., 2015. Measuring and Evaluating Time and Energy-use Relationships (METER). University of Oxford.

Hampton, S., 2016. The practice of working from home and the place of energy, in: What Energy Is for: The Making and Dynamics of Demand. Presented at the DEMAND, Lancaster University.

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

Higginson, S., McKenna, E., Thomson, M., 2014. Can practice make perfect (models)? Incorporating social practice theory into quantitative energy demand models. Presented at the BEHAVE 2014 - Paradigm Shift: From Energy Efficiency to Energy Reduction through Social Change, ECI, Oxford.

Hitchings, R., 2012. People can talk about their practices. Area 44, 61–67. https://doi.org/10.1111/j.1475-4762.2011.01060.x

Hui, A., Schäfer, H., n.d. Practice Theory Methodologies [WWW Document]. URL https://practicetheorymethodologies.wordpress.com/ (accessed 5.23.18).

Kuijer, L., 2014. Implications of Social Practice Theory for Sustainable Design (PhD Thesis). Delft University of Technology.

LeCompte, M.D., Goetz, J.P., 1982. Problems of Reliability and Validity in Ethnographic Research. Rev. Educ. Res. 52, 31–60. https://doi.org/10.3102/00346543052001031

McCormack, D.P., 2003. An event of geographical ethics in spaces of affect. Trans. Inst. Br. Geogr. 28, 488–507.

Narasimhan, K., Roberts, T., Xenitidou, M., Gilbert, N., 2017. Using ABM to Clarify and Refine Social Practice Theory, in: Advances in Social Simulation 2015, Advances in Intelligent Systems and Computing. Springer, Cham, pp. 307–319. https://doi.org/10.1007/978-3-319-47253-9_27

Nicolini, D., 2016. Is small the only beautiful? Making sense of "large phenomena" from a practice-based perpsective. pp. 98–113.

Nicolini, D., 2012. Practice Theory, Work, and Organization: An Introduction. Oxford University Press.

Nicolini, D., 2009. Zooming In and Out: Studying Practices by Switching Theoretical Lenses and Trailing Connections. Organ. Stud. 30, 1391–1418. https://doi.org/10.1177/0170840609349875

Reckwitz, A., 2002. Toward a theory of social practices: a development in culturalist theorizing. Eur. J. Soc. Theory 5, 243–263.

Reid, L., Ellsworth-Krebs, K., 2018. Nudge(ography) and practice theories: Contemporary sites of behavioural science and post-structuralist approaches in geography? Prog. Hum. Geogr. 030913251775077. https://doi.org/10.1177/0309132517750773

Schaffer, F.C., 2006. Ordinary language interviewing, in: Interpretation and Method: Empirical Research Methods and the Interpretive Turn. Armonk, N.Y.: London: M.E. Sharpe, Armonk, N.Y.: London.

Schatzki, T., 2016. Practice theory as flat ontology, in: Spaargaren, G., Weenink, D., Lamers, M. (Eds.), Practice Theory and Research: Exploring the Dynamics of Social Life. Routledge, pp. 28–43.

Schmidt, R., 2016. The methodological challenges of practising praxeology, in: Spaargaren, G., Weenink, D., Lamers, M. (Eds.), Practice Theory and Research: Exploring the Dynamics of Social Life. Routledge, pp. 43–59.

Shove, E., 2017. Practice theory methodologies do not exist. Pract. Theory Methodol.

Spaargaren, G., Weenink, D., Lamers, M., 2016. Practice Theory and Research: Exploring the dynamics of social life. Routledge.

Thrift, N., Dewsbury, J.-D., 2000. Dead Geographies—And How to Make Them Live. Environ. Plan. Soc. Space 18, 411–432. https://doi.org/10.1068/d1804ed

Turner, R.H., 1947. The Navy Disbursing Officer as a Bureaucrat. Am. Sociol. Rev. 12, 342–348. https://doi.org/10.2307/2086524

Wallenborn, G., Wilhite, H., 2014. Rethinking embodied knowledge and household consumption. Energy Res. Soc. Sci. 1, 56–64. https://doi.org/10.1016/j.erss.2014.03.009

Wilson, C., Janda, K., Bartiaux, F., Moezzi, M., 2015. Technical, economic, social and cultural perspectives on energy demand, in: Ekins, P., Bradshaw, M., Watson, J. (Eds.), Global Energy: Issues, Potentials and Policy Implications. pp. 125–147.

Yin, R., 1994. Case Study Research: Design and Methods, 2nd ed, Applied Social Research Methods. SAGE Publications, London.

4. PAPER 1: AN ETHNOGRAPHY OF ENERGY DEMAND AND WORKING FROM HOME: EXPLORING THE AFFECTIVE DIMENSIONS OF SOCIAL PRACTICE IN THE UNITED KINGDOM

4.1 ABSTRACT

The practice of working from home has become widespread in developed countries, and the numbers of regular home workers are steadily increasing. There are potentially positive implications for energy consumption associated with home working, but these depend on myriad variables. This qualitative study, based on interviews with regular home workers, provides a more in-depth perspective on how and why energy is used compared with quantitative models of household consumption. Ethnographic research data is analysed using insights from practice theory. Placing the practice at the heart of analysis, it explores meanings, materials and competences involved in home working, and attends to the affective experiences of practitioners. Considering working from home as an integrative practice, it explores how dispersed practices are incorporated into individual performances, bringing about affective satisfaction. Findings show that the practice of working from home is characterised by themes of comfort, control and flexibility, with implications for energy demand. It is argued that the synthesis of practice theory and affect can provide valuable insights for energy research. The paper discusses the implications for demand reduction, demand shifting and 'smart' controls, with reference to the role of employers, researchers, policy-makers and home workers themselves.

Keywords: working from home; energy practices; affect; comfort

4.2 INTRODUCTION

The practice of working from home has become widespread throughout the 'knowledge economy' of Europe and North America and is steadily increasing in both developed and developing countries, led by the expansion of internet access (Welz and Wolf, 2010; GWA, 2016; Reaney, 2012). In the UK, more than 25% (7.7 million) of those in employment reported in 2014 that they sometimes work from home as part of their main job, while 4.2 million (13.9%) reported their home as their main place of work, an increase of 2.8 percentage points since 1998 (ONS, 2014a, 2014b). Motivations for individuals working from home include eradicating the commute, facilitating flexible child-care arrangements, aiding concentration and mental health benefits (Anderson et al., 2015; Garner et al., 2016), while opportunities for employers include increased productivity and energy savings (Carbon Trust, 2014).

Achieving reductions in energy consumption in domestic and commercial buildings is a universal priority for policy-makers. Focusing on the practice of home working represents an opportunity in this regard, with potential savings of up to 1.4 tCO_2e per year per home-based employee, according to UK estimates (Carbon Trust, 2014). Further, reducing energy demand from small and medium sized enterprises (SMEs) is a significant policy challenge: with nearly 60% of all SMEs based in domestic premises, achieving energy reductions through supporting efficient home working practice offers a way of addressing this sector of the economy while potentially avoiding politically unpalatable 'red-tape' for small enterprises.

However, data on energy consumption associated with the practice is subject to uncertainty due to the difficulty of separating consumption data from other domestic

practices, being outside the scope of corporate energy portfolios, and with a significant proportion of home-based businesses undeclared due to legal and tax concerns and therefore 'invisible' to public authorities (Mason et al., 2011). Efforts to quantify the environmental impacts of home working have been made in technical and transport focused literature (Banister et al., 2007; Fu et al., 2012; Kitou and Horvath, 2003; Nelson et al., 2007; Walls and Safirova, 2004). On the one hand, when substituting for a commute, working from home can represent significant energy and emissions savings (Walls and Safirova, 2004). On the other, the heating and lighting of a domestic space in addition to an unused desk at work, or the use of technologies such as cloud computing services can lead to increased energy consumption and environmental impact (Carbon Trust, 2014; Fu et al., 2012). In attempting to calculate a net balance of energy demand, key factors include the mode, length and energy intensity of the commute; the ability of employers to manage desk-space flexibly; and the technologies and practices involved in heating and lighting the home space (Nelson et al., 2007). Whilst many empirical studies find net energy and emissions reductions associated with home working (Banister et al., 2007; Fu et al., 2012; Nelson et al., 2007; Walls and Safirova, 2004), considerable methodological difficulties and the highly contingent nature of the practice prevent generalisations about its benefits (Mokhtarian et al., 1995).

Several calls have been made in this journal for research which tries to understand the messy dynamics of energy demand within the home, seeking greater analytical depth than quantitative models permit (Bell et al., 2015; Ellsworth-Krebs et al., 2015). Stern (2014) points out that as actors in the energy system, householders have multiple roles, requiring a range of research approaches. Home workers span several of Stern's categories, as domestic consumers of energy, participants of institutions and as practitioners whose

activities have implications for the wider energy system. Seeking to capture their hybrid practice, this paper develops an account based on ethnographic data, placing home working at the 'heart of enquiry' (2014). The three-element model of practice theory provides a theoretical framework for investigating elements of working from home and the role of energy (Shove and Pantzar, 2005; Shove et al., 2012). The analysis also draws on discourses of affect to provide insights into the experiential nature of the practice (Anderson, 2009; Pile, 2010; Reckwitz, 2012). This approach offers a number of valuable insights. First, it encourages an in-depth look at how constituent elements of practice circulate through repetitive performances to form and continually configure practice entities. Second, it expands the field of enquiry to account for the *interaction* between bundles of practices, highlighting the 'affectively satisfying' effects of incorporating 'dispersed practices' into home working (Cass and Faulconbridge, 2016). This allows characteristic themes associated with working from home to be identified, providing insights into the energy consuming behaviours of home workers. These themes emerge through findings which describe achieving comfort when working from home, the exertion of control over material assemblages, and the performance of flexibility through the space-times of practice. Finally, these insights have ramifications for efforts to reduce demand and encourage demand-side flexibility: challenges for energy systems in transition throughout the world. In accordance with this expansive approach, this paper is guided by two broad research questions: 1) what are the characteristics of working from home as a practice? 2) what are the implications for energy demand?

The rest of the paper is structured in five parts. The next section describes the insights provided by practice theory as it has been applied in studies of energy consumption in the domestic setting. The concept of affect is introduced, and links are drawn with a practice

perspective. Section 4.3 outlines the methods used for this study and its analytical approach alongside a discussion of the challenges of researching practices. In section 4.4, findings are structured according to characteristic themes which emerge from empirical data. The first part of the discussion in section 4.5 develops insights from the theoretical approach employed, before outlining implications for energy systems and identifying possible areas for further research. The conclusion argues that practice theory and affect together offer a fruitful theoretical framework, with implications for researchers, employers and policy-makers.

4.3 A PRACTICE THEORY PERSPECTIVE ON WORKING FROM HOME

Practice theory has its roots in philosophy (Schatzki, 1996), but has been widely adopted by sociologists (Shove et al., 2012) in seeking to understand how widespread, everyday practices are established and maintained. The practice perspective decentres the individual as the unit for social analysis (Reckwitz, 2002), instead, developing a model of 'distributed agency' (Wallenborn and Wilhite, 2014) which highlights the ways in which 'elements' such as meanings, materials, skills, technologies, rules and embodied knowledge configure everyday social practices (Gram-Hanssen, 2010a; Gabriel and Watson, 2013). With a shift in emphasis away from the individual as the principle agent of consumption (Warde, 2005), this theoretical framework has been widely applied within social scientific studies of energy demand (Gram-Hanssen, 2010a; Shove et al., 2012; Shove and Walker, 2014). Practice theory expands the field of enquiry beyond a narrow emphasis on individual choice, identifying the role of physical elements such as technology, materials and building design in mediating everyday energy-consuming

practices (Shove et al., 2012; Shove and Walker, 2014). It also encourages research into how social and cultural meanings and forms of embodied and intellectual knowledge are reproduced through everyday activity. Practice theory has been widely employed in studies of energy consumption in the household, for example in efforts to understand quantitative observations regarding the diversity of energy demand patterns within even identical houses (Gram-Hanssen, 2010a). Empirical studies since the 'practice turn' have analysed elements of practice within the household including lighting (Crosbie and Guy, 2008); the use of appliances, technologies and interfaces (Gram-Hanssen, 2010b; Darby, 2006) and thermal comfort (Gram-Hanssen, 2010a; Shove, 2003; Royston, 2014).

A small number of studies in energy research have examined workplace practices using practice theory, identifying insights into energy consumption by looking beyond the user as the unit of analysis. Garabuau-Moussaoui (2014) argues that building 'occupants' are constructed as actors within a 'technology script' by a combination of corporate, architectural and social logics, finding that an attention to practices helps to uncover the material, social and ideological elements of comfort in the workplace. Similarly, whereas studies of organisational energy demand conventionally focus on the corporate entity and individual users, Janda (2014) argues for a 'building communities' approach, identifying the potential for change in energy management practices through a focus on social – rather than technical – potential. Also focusing on practices rather than organisational units, Powells et al. (2015) find potential for active network management amongst SMEs. Despite its growing incidence and significance for energy demand however, no studies since the 'practice turn' have addressed the practice of working from home.

This paper builds on three theoretical constructs developed in the literature to guide analysis of empirical data. Firstly, it follows a number of recent publications adopting the 'three element model' as a means of clustering elements of practice (Higginson et al., 2015; Shove and Pantzar, 2005). Led by the work of Elizabeth Shove, this approach groups elements of practice into meanings, materials and competences. These categories assist with analysis of qualitative research findings, helping to uncover the complex characteristics of practice (Shove et al., 2012; Shove and Pantzar, 2005).

Secondly, it draws on Schatzki's account which describes the field of practice in two dimensions (2001). In the 'organisational dimension', the constellation of elements constitute the 'practice-as-entity': a relational network existing in the realm of potential. This constellation is 'integrated' through performance, which takes place in the 'activity dimension'. Practice entities become recursively reconfigured through repetitive performance, as new elements are recruited and others discarded. These two dimensions help to highlight how practices are influenced by spatial and temporal settings, as performances are conducted in different material environments and interwoven with other practices. This paper explores how the characteristics of working practices change as work is brought into the domestic setting. It follows a number of studies which have sought to identify the characteristics and changing dynamics of practice, for example in the development of digital photography (Shove and Pantzar, 2007); the spread of Nordic walking (Shove and Pantzar, 2005), or everyday mobility (Cass and Faulconbridge, 2015).

A third theoretical construct used in this paper is Schatzki's distinction between *integrative* and *dispersed* practices (1996). Dispersed practices are small scale activities such as

following rules (Warde, 2005), tinkering (Royston, 2014) or consuming energy through appliances' standby mode (Gram-Hanssen, 2010b). They can be conducted without context and incorporated into more complex social practices, taking on different meanings. Integrative practices are broader activities including business practices, shopping or cooking. In Schatzki's account (1996), these practices have their own 'teleo-affective structure', which is to say they hold meaning and significance both for the performers of practice and in the wider social world. This distinction has been used effectively by Cass and Faulconbridge (2015) to delve into the integrative practice of mobility, into which a variety of dispersed practices such as listening to music and navigating are incorporated. The authors argue that these purposive incorporations produce 'affective satisfaction' in otherwise mundane patterns of mobility, such as commuting. This paper applies this construct to the practice of working from home: an integrative practice increasingly performed, reproduced and reconfigured in millions of homes throughout the world. Drawing on a sample of UK home workers, it focuses on the incorporation of the dispersed practices of achieving comfort, controlling material elements, and expressing flexibility. This bundling is shown to animate the practice of working from home, and produce affective satisfaction.

Cass and Faulconbridge's paper is one of relatively few in the energy research literature that directly seek to address the *affective* elements of practice. In studies of household consumption this is somewhat surprising, given the undeniable impact of building design and architecture on inhabitants' affective sensibilities. Affect is a concept with origins in psychology (Tomkins, 1962), but has been adopted and developed in the social sciences (Pile, 2010). Geography has led the way in a discourse which also draws on non-representational theory in efforts to highlight 'the ways in which the world is emergent from

a range of spatial processes whose power is not dependent upon their crossing a threshold of contemplative cognition' (McCormack, 2003).

For studies of comfort in the home, Andersons' (2009) account of 'affective atmospheres' provides rich theoretical insights, describing how affect emanates from the circulation of bodies and elements of the material environment. Vannini and Taggart's account of domestic warmth (2014) draws on these principles to explore the precognitive, embodied characteristics of thermal comfort. The authors demonstrate how, in off-grid homes in Canada, active involvement with the material technologies of heating intensifies inhabitants' affective sensitivity towards thermal conditions in the home environment.

There are clear parallels between geographers' use of affect and the concept of distributed agency developed in ontological accounts of practice theory (Wallenborn and Wilhite, 2014). Just as practice theory decentres the individual from the focus of analysis, affective literature attends to the pre-cognitive, embodied and transpersonal dimensions of experience (Pile, 2010). This paper explores the synergies between both theoretical perspectives by attending to the affective dimensions of the practice of working from home, finding implications for energy demand. For example, it responds to Ellsworth-Krebs and colleagues' call in this journal for further empirical explorations of the links between home and comfort (Ellsworth-Krebs et al., 2015). The next section sets out the methods used for investigating the practice of working from home, and discusses the challenges of conducting research on affect.

4.4 METHODS

The empirical study was designed according to Bryman's 'steps in qualitative research' (2012). A mix of qualitative methods were used, including semi-structured interviews with

20 UK based home workers, conducted in January-June 2016. Participants were recruited from personal and professional networks and all worked in professional services in Oxfordshire, UK: 10 each in the public and private sectors. Seven were self-employed and another seven were responsible for managing at least one employee. Three participants identified home as their main place of work, with the remainder working from home for at least one day per week. All participants were usually alone when working from home, and where possible interviews were conducted in their homes. In some cases, meetings took place in cafés where participants would bring their work on home working days for a change of scene. Additional data was collected in the form of photographs and personal reflection on several years of regular home working. In placing the practice at the heart of enquiry, interviews focussed on the meanings, materials and competences involved in working from home, with questions about energy consumption woven into conversations about home, work, boundaries and work-life balance. Energy related questions focused on how home workers achieved comfort and used electrical appliances during their working day. Interviews were recorded and notes taken to draw out the main points from the discussion. Following the interviews, notes were added to by revisiting recordings and transcribing key passages. Data were compiled and analysed in a spreadsheet, where themes relating to the two research questions began to emerge. Participants were recruited to the study until themes and even specific phrases began to recur, reaching what Bryman (2012) refers to as 'theoretical saturation'. Respondent validation was then sought through additional interviews with a sub-sample of five participants, in which emergent themes associated with home working were discussed.

The aim of this methodology was not to establish a representative sample of home workers, nor to draw universal conclusions about energy consumption patterns in the home: the

sample is both too small and non-random. Nonetheless, the sample focuses on geographies and sectors where home working is prevalent. The highest proportion of home workers in the UK work in professional services, and in 'affluent towns and cities and their rural hinterlands in Southern England' (Mason et al., 2011). What follows is abductive analysis (Cunliffe and Coupland, 2012), informed by home workers' reflections on their practice, subsequent interpretation of their narratives and participation as a regular home worker. It follows Flyvberg's call for social scientific research to 'drop the fruitless efforts to emulate natural science's success in producing cumulative and predictive theory', and instead to 'contribute to society's practical rationality in elucidating where we are, where we want to go, and what is desirable' (2001, pp. 166–167). Such guidance is pertinent for the practice of working from home, given the optimism which it inspires in those aiming to reduce the environmental impact of working practices (Carbon Trust, 2014; Spurling and McMeekin, 2015).

This paper explores the 'teleo-affective' structuring of working from home by analysing how the integrative practice incorporates other dispersed practices in multiple performances. However, seeking to account for affective dimensions of practice presents a methodological challenge, as the realm of affect is said to exist both prior to and beneath the 'sociolinguistic fixing' of conscious reflection (Massumi, 2002). The reliability of asking interviewees to linguistically reflect on aspects of their practice is a subject of debate, particularly in geography, where non-representational theory and affective approaches remain controversial in this strong empirical tradition (Hitchings, 2012; Cresswell, 2012; see also McCormack, 2003; and Thien, 2005). Adopters of non-representational theory have used a variety of alternative methods to access affective registers, including dance (McCormack, 2003), images (Latham and McCormack, 2009) and 'sensuous

ethnography' (Vannini and Taggart, 2014). Conversely, both Bonnington (2015) and Hitchings (2012) make compelling arguments for the role of reflexivity and the interview as a source of empirical data for research on practices. In one of his more recent works, Schatzki has sought to clarify the 'teleo-affective' dimension of practice, arguing that affective structures can be 'to varying degrees allied with normativized emotions and even moods' (Schatzki, 2010, p. 80). Although language and reflexivity cannot completely account for the affective dimensions of practice, these contributions from Hitchings, Bonnington and Schatzki indicate the value of personal narrative and observation as sources of research data.

Seeking to capture the affective sensibilities of home workers, this paper analyses interview data not as a source of objective insight, but as an artefact of narrative sensemaking carried out in a staged setting (Cunliffe and Coupland, 2012). Sitting down for an hour and attempting to explain to a researcher the variety of meanings, materials and skills required to conduct one's work from home is surely an unusual experience. In seeking language, insights and narratives to reflect on their practice and the role of energy, interviewees are required to step outside the normal doings and sayings of the practice: a process which can both be illuminative and transformative for the 'carrier' of practice (Reckwitz, 2002). Interviews are therefore considered performative occurrences in which the researcher is crucial: in framing the discussion, interpreting meaning and representing results. Follow-up interviews also offered a sub-sample of participants a chance to reflect again on their practice and how it might have changed since the first interview, as well as on the nature of the interview process itself. How did they feel about describing the nature of this solitary, private practice, perhaps for the first time? Had their accounts surprised them at all? The findings that follow should be considered as products of participatory

research, in which reflections on home working emerged through a process of collaborative discovery. The analysis draws on Cass and Faulconbridge's (2015) notion of 'affective satisfaction' as a means of capturing teleo-affective fulfilment expressed by home workers. In the data cited below, the identities of research participants are anonymised.

4.5 CHARACTERISTICS OF AN INTEGRATIVE PRACTICE

Three themes emerge from interviews with home workers, based on incorporating dispersed practices into working from home. These are comfort, control and flexibility; themes which may be seen as characteristics of the teleo-affective structure of working from home. Each is presented in turn, including a summary of related literature and insights from empirical data. The meanings, materials and competences associated with these themes are discussed and summarised in Table 4-1.

4.5.1 COMFORT

Thermal comfort is a subject of interest across disciplines, with this journal demonstrating the breadth of approaches even within social sciences, through publications applying psychological approaches (Huebner et al., 2016), practice theory (Royston, 2014; Walker et al., 2014) actor-network theory (Nyborg and Røpke, 2015), building models (Sdei et al., 2015) and behaviour change theory (Lopes et al., 2015) to studies of household heating and cooling. Beyond the social sciences, in literatures concerned with building design and energy engineering, comfort has become technically specified, as 'optimal' conditions are defined in relation to human physiology and embedded in building energy management (e.g. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE); Fanger, 1970). In contrast to relatively fixed ideas of

comfort, the notion of 'adaptive comfort' has been developed to highlight individuals' ability to achieve comfort in flexible ways by making psychological, physiological and behavioural adjustments (de Dear and Brager, 1997; Nicol and Humphreys, 2002). Social scientists employing practice theory have expanded on technical and behavioural discourses on comfort, illustrating the variety of materials and technologies (Gabriel and Watson, 2013; Royston, 2014); cultural norms (Shove, 2003); forms of knowledge (Gram-Hanssen, 2010a); and power relations (Healy, 2008) involved in the everyday practices that formulate comfort.

How comfort relates to practices is an area for debate (Valdorff-Madsen, 2014). Can it be considered a practice itself, an element, or an outcome of other practices? The findings below and subsequent discussion consider it as an *attribute* of practice, emerging from the incorporation of dispersed practices in multiple performances. For working from home, these include tinkering with heating controls and materials in the home, as well as bodily movement and clothing.

All participants reported having high levels of control over the temperature when working from home, citing the unconstrained ability to adjust thermostats, radiator controls and timers in their own homes. Despite this, 14 of 17 occasional home workers reported maintaining *lower* temperatures when working from home when compared with their normal place of work, while 17 of 20 also tolerated cooler temperatures when working at home compared with other times spent in their homes. When reflecting on this, some participants were surprised to realise this was something they did. Between the first and second interview for example, Peter had become increasingly aware of his tolerance of cold when working from home having put this into words for the first time previously. He

had subsequently adjusted his practice to ensure he had all the clothing and materials he needed to prevent him becoming gradually – and imperceptibly - more uncomfortable. When attempting to explain their motivation for tolerating colder temperatures, the most common explanations cited a desire to conserve resources; not having to respond to the needs of others; staying alert for work and reducing environmental impact.

18 respondents reported using clothing and blankets to offset the need for heating when working from home, including Mick who wore 'big fluffy socks and a hoody' and Emma who found satisfaction wearing her 'leopard print onesie'. Materials such as hot-water bottles, hot drinks and microwaveable wheat sacks were utilized for comfort by several participants, whilst Anne was one of several interviewees who reported making use of bodily movement:

> 'My main cure is to move... I have a small little trampoline in the garden so if the going gets really rough I'll go out and bounce on that! Then it feels warmer when you come in. You know, I've never told anyone all these secrets!'

Home workers seemed to relish the opportunity to make use of materials, technologies and bodily movement in ways that would be inappropriate in workplace environments. Practising adaptive comfort presented an apparently satisfying challenge, requiring forms of embodied competence and a variety of materials in order to avoid the use of central heating.

Anne's revealing of 'secrets' is an example of how interviews provide a unique platform for reflections on practice, as well as highlighting the intimate nature of comfort practices in the home. While all interviewees conducted the same broad set of work tasks in both home and office environments, it was the incorporation of different dispersed practices

into working practices which starkly delineated their practice in the two settings. In their workplace environments, Jade and Dorothy, two senior managers in a large organisation, spoke of the importance of projecting authority and how draining it could be to 'push certain agendas'. Clothing, the use of language and the embodiment of authority through physical competences such as posture are all important in these environments. For Dorothy, home working offered the opportunity to 'reconcile' herself in a 'safe and cosy' environment. Like Anne, Jade revealed the private nature of her practice with a show of vulnerability, admitting 'I might get back into bed if it's really cold… please say I'm not the only one who's said that!'.

These illustrations of dispersed practices show that affective sensibilities are central to the experience of home working, and that the notion of comfort was constituted by more than a physiological response to thermal conditions. Isabelle, for example described how 'light…. in some way it sort of compensates [for heat]. Looking out over beautiful views… part of being warm is about a feeling of well-being'. This quotation may be considered a 'non-rational' account of affective experience. One might typically think of warmth or comfort as a prerequisite for well-being, but put the other way around, Isabelle reveals that the word warmth holds significance for her beyond physiological sensation. Her account was mirrored by other interviewees who had trouble finding words to describe how the concepts of home and comfort were linked. When asked about the meanings of home, more than half of the participants used words like 'comfy', 'cosy' and 'comfort', however, long pauses, expressions of contemplation and sometimes even discomfort were evident when attempting to elaborate on this relationship.

If we understand working from home as a particular iteration of wider working practice, then it becomes clear that its distinctive characteristics emerge from the incorporation of dispersed practices in the activity dimension. Affective satisfaction is generated through the creative use of materials such as clothing, mugs of tea and hot water bottles, movement and avoiding the use of central heating, incorporated into the performance of home working. The next section describes how a sense of control is a central characteristic of working from home, and how the process of incorporating dispersed practices can itself bring about affective satisfaction.

4.5.2 CONTROL

In research on adaptive comfort, personal control has been shown to increase tolerance of a wider range of thermal conditions (Luo et al., 2016). The corollary of this is that energy savings could be made through the provision of greater personal environmental controls in workplaces (Zhang et al., 2015). All but one participant reported having greater control over thermal conditions when working from home as opposed to workplace environments. This was both due to having better access to technologies such as thermostats and radiators in the home, as well as being unconstrained by the perception of others' needs for comfort when cohabiting space. In some cases respondents reported colleagues actively expressing discomfort, while others cited co-workers' needs based on gender, body-mass-index or ethnicity:

> 'Sharing with three women, they like it on full tilt.' (James)
>
> 'Some of those guys, they're really big… they're actively really hot… you can tell they are.' (Dorothy)

> 'We have an Italian contingent that have been known to wear their coats full time.' (Michael)

Temperature was reported as a common source of tension in shared environments. Josh indicated that this had been a topic of much debate at his workplace, where 'no one seems to agree on anything about heat', leading to senior management intervening on the use of thermostats: 'the policy is we don't touch them'. In Michael's ethnically diverse workplace, culturally mediated notions of comfort had led to 'thermostat wars'. In all but one case, days spent working from home offered participants a rare opportunity for controlling the temperature of their working environment.

Whereas most interviewees usually worked from home alone and tolerated lower temperatures when doing so, several cited the occasions when family members or housemates were home as times when they might put the central heating on. Rita's account corroborated the notion of 'social loading' (Wilhite and Lutzenhiser, 1999):

> 'If I'm alone in the house, I try to avoid turning on the main heat, just because… I'm alone. But if my housemate is going to stay at home then I'll probably turn on the heat.'

The question 'to what extent do you have control over the temperature when working from home', prompted some surprising responses. Describing the means of control, technologies such as thermostats, programmable timers and radiator valves were cited as key elements of this dispersed practice. However, more surprisingly around half of the sample responded to this question by choosing to talk about waste and inefficiency:

> 'It's a very old Victorian terrace, so it's probably leakier than it should be.' (Anne)

> 'Bizarrely, even though it's quite a new flat, it's not particularly good at saving heat… the windows… even though its double glazing, it's not great double glazing, and you get a bit of a draft under the door.' (James)

> 'There must have been about 15 metres of copper piping… it was immense, just piping everywhere.' (Dorothy)

It is clear from these responses that the inefficiency of building materials and meanings of waste were intertwined with home workers' perceptions of temperature control.

Different forms of competence were reported as elements of the dispersed practices of comfort, including forms of intellectual knowledge and embodied know-how (Gram-Hanssen, 2010b). Dorothy for example, took a real interest in the technologies of her domestic heating system and had recently upgraded her boiler:

> 'Now I feel like I have a lot [of control] because I spent a lot of time training up on heating systems.' (Dorothy)

It is clear that Dorothy's sense of control is made up of more than an ability to set the temperature in her home, but encapsulates a sense of intellectual and affective satisfaction gained from the learning process, getting to know the materials and technologies in her home. As well as the *intellectual* knowledge described by Dorothy, interviewees recruited material objects using forms of *know-how* that Royston terms 'tinkering' and 'bricolage' (2014).

> 'You can tweak a Labrador [to warm your feet]' (Isabelle)

> 'I notice that I get cold fingers, so I find myself going downstairs for a hot drink literally to warm up my cold fingers again… its more targeted'. (Peter)

Isabelle and Peter's descriptions of targeted comfort were accompanied by a visible sense of glee relating to their inventive means. As was Liza's description of working on the floor

in front of the fire, using its periodic demand for new logs as moments for reflecting on her work and refocusing. During a tour of their homes, Emma and Martha showed pride in having created homely, brightly decorated home-offices, choosing the location of their desk to maximise passive solar gain. These examples illustrate the distribution of agency in practice, shared between bodies, materials and influenced by the logics of fire or the weather. As a form of dispersed practice, tinkering with the material assemblages of the home space to establish comfort brought about affective satisfaction.

The perception of ownership was important for some participants in producing affective satisfaction, giving homeowners like Nathan the power and freedom to curate their environment:

> 'I've upgraded it slowly over the years. So I've got central heating, I've got double glazing, (I could do with more insulation), but all of that allows me to control it, and makes working from home a more realistic option. I would feel a lot less comfortable if I was sharing. It would be like *perching*. Whereas I feel like this is a workspace where I'm in control of it. The energy side is part of that… part of my broader personal situation.'

It is clear from the examples above that control is a key characteristic of working from home, associated with positive affective sensibilities, and as Nathan says, bound up with the consumption of energy. Focusing on the incorporation of dispersed practices relating to heating, these findings show that thermal conditions are not solely responsible for producing affective satisfaction. Instead, recruiting materials, reducing waste, performing know-how, expanding one's knowledge and upgrading one's own home are expressions of control which can bring satisfaction and even glee. It is the *processes* of incorporating dispersed practices into home working such as interacting with pets, making hot drinks or even getting back into bed, which give character and affective satisfaction to the practice.

4.5.3 FLEXIBILITY

Flexibility is a concept gaining increasing attention in studies of energy demand and social practices, in response to challenges raised by the need to decarbonise the electricity grid. In future scenarios where thermal power plants are replaced by large amounts of intermittent renewables, peak demand is predicted to become a significant challenge, requiring flexibility in various forms on both the supply and demand sides of the system (DECC, 2015). It is unclear to what extent domestic users of electricity will offer flexibility as a service to the wider system, or what the mechanisms for achieving this might be (Frontier Economics, 2015). However, a prerequisite to developing policies to shift domestic demand is an understanding of flexibility in everyday life (Friis and Haunstrup Christensen, 2016; Southerton, 2009; Walker, 2014).

Every home worker interviewed expressed satisfaction with the flexibility afforded to them in their practice. As we have seen so far for comfort and control, one form of flexibility relates to the ability to *selectively* incorporate dispersed practices and their constituent elements in the performance of integrative practices. However, there are many forms of flexibility (Grunewald, 2016). A practice can take on the attribute of flexibility for example, when it affords the opportunity to be performed in different spatial settings, or interwoven with the sequencing and scheduling of other practices (Walker, 2014). Enabled by computer technology and the internet, company policy and forms of self-discipline, this section explores the spatial and temporal dimensions of flexibility reported by home workers.

Many respondents described their motivations for working from home in the context of having a break from routine. For example, several managers cited the demands of always being available and interruptible, or tied up in meetings with little time for themselves:

> 'In the office, everybody wants a piece of me... Working from home is my sanity time.' (Jade)

Home working provides the opportunity to be flexible with participants' time and focus, for instance by changing normal working hours. My sample of home workers would often start later, take a longer lunch break and work into the evening:

> 'I might have a break and assemble the dinner at half past 4 or 5, then put it in the oven and go back and do some work.' (Isabelle)

These forms of flexibility were described alongside reports of blurred boundaries between domestic and working practices with both positive and negative implications. On the one hand, conducting household chores during the working day afforded home workers more time in evenings and on weekends for other activities, while on the other, many struggled to manage the transition from *doing* work to *being* at home. Managing this divide was reported by many interviewees as a challenge requiring self-discipline. This often took the form of symbolic acts like Dorothy's ritual of shutting the laptop and putting it away in her work bag as a way to demarcate work practices from home. Mick felt it was 'unhealthy' to work at the kitchen table, instead using a spare bedroom to which he was able to shut the door at the end of the working day. Simon even had a sign on his spare room saying 'work', and resisted entering outside of his self-allocated working hours. For many, the challenge was in managing the relationship with computing devices which encroached on 'home time', particularly if they were used for both work and social activities. Jade for example felt it was important to remind herself that 'we operate technology, it doesn't

operate us'. While flexibility was overwhelmingly described in positive terms, these examples indicate some of the tensions associated with bringing work into the home environment, highlighting the importance of self-discipline as a form of competence.

All 20 respondents described interweaving household chores with desk-based work, citing laundry in particular. Loading the washing machine, dryer, or hanging out washing were tasks well-suited to break-times, sometimes acting as prompts for taking a pause.

> 'There's usually a day [in the 3 days per week working from home] … where the weather is going to be pretty reasonable… so I would actually go with the weather…it's a bit of a break from sitting in front of the computer.' (Rupert)

Living alone in a small flat, Josh uses his home-working day to do the laundry, but finds the washing machine to be distractingly noisy, so typically takes his work to a café for a couple of hours before coming back and hanging up his wet clothes. The examples from Rupert and Josh highlight how flexibility is not simply the ability of the individual to dictate the circumstances of practice, but that sequencing of bundles of practice can be influenced by appliances, the 'needs' of the house and the weather. They demonstrate the agentive role of material assemblages in giving shape to practices, issuing their own demands for a range of competences, including coordinating schedules and interweaving practices.

Three kinds of flexibility emerge from these findings. The first involves the ability to *incorporate different dispersed practices* into home working, for instance those practices involved in adaptive comfort: targeting warmth, tinkering with materials and conserving energy. In this form of flexibility, different materials, meanings and competences are mobilised in each incorporative practice-as-performance. Second, flexibility is manifest for home workers in having the freedom to *choose when and where to work*. Home workers

are able to transcend the logic of institutional rhythms (Friis and Haunstrup Christensen, 2016), for instance getting back into bed with a laptop, going to a café, or working into the evening. Finally, flexibility can be seen in the ability to *coordinate daily schedules involving multiple integrative practices*, for example interweaving work with household chores. Each of these forms of flexibility bring affective satisfaction for home workers.

4.5.3.1 ONE-SIDED FLEXIBILITY?

For interviewees who had another regular place of work, over 75% reported that their desk would be unoccupied – but heated and lit - when they were working from home. In these circumstances, the energy used for heating and lighting when home working constitute *additional* consumption. Only one employer was identified as mitigating this effect by providing a flexible 'hot-desking' arrangement, allowing them to downsize and cut leasing costs. The solution in this case was reported with dissatisfaction, as Jade said that the result was a cramped working environment. She also cited the requirement to carefully coordinate the schedules of flexible workers, which was not always done successfully, often requiring her to give up her home working day to attend meetings. While hot desking has clear energy reduction potential, its affective implications are under-researched.

This study shows that for the employer, the benefits of flexibility often go unrealised, or present management challenges when energy and cost savings are made. For most interviewees, flexibility was seen as a benefit *provided* by employers, enabling workers to avoid a stressful commute, or even to compensate for uncompetitive pay. Although flexibility was largely described positively, one participant described the problem of feeling isolated and disconnected from colleagues due to home working. These affective

impacts are explored extensively in organisational and psychological literature (Mann and Holdsworth, 2003), and have implications for the uptake and sustainability of the practice. Table 4-1 collates the various elements of practice identified from this qualitative analysis, grouping them into the three characteristic themes. Energy is implicated in each performance of practice as elements are integrated.

Table 4-1 - How the characteristic themes of working from home intersect with elements of practice

	Comfort	Control	Flexibility
Meanings	• Linked with concept of home • Opposite to work environment • Creativity / unconventional means • Energy conservation	• Alone vs shared environments • Waste, inefficiency • Others' expectations • Company policy / 'Thermostat wars'	• Break from routine • Freedom to choose work tasks • Frees time elsewhere • Blurred boundaries • Isolation
Materials	• Clothing and blankets • Bodies • Hot drinks, wood fires, wheat sacks • Unconventional materials e.g. pets • Daylight	• Others' bodies • Thermostats, radiator controls, heating timers • Unconventional materials e.g. pets	• Household appliances • Weather • Bodily conduct e.g. chores
Competences	• Using heating controls • Bodily movement • Heating single room vs whole house • Targeting warmth – fingers and toes	• Know-how of managing heating and personal comfort • Intellectual knowledge of building fabric e.g. insulation, piping	• Scheduling and sequencing • Self-management e.g. breaks • Delineating home and work • Employer energy management

4.6 DISCUSSION

Using theoretical tools offered by practice theory, key characteristic themes associated with the teleo-affective structure of working from home have so far been identified, each of which provide affective satisfaction for practitioners. The findings presented above demonstrate *how* these characteristics are generated in practice, through mechanisms such as incorporating dispersed practices, selecting elements and spatial settings, and interweaving performances into temporal sequences. But what is the *value* of identifying affective satisfaction in practices, and what does all this mean for energy demand? This discussion tackles these questions in turn, first making four assertions about the value of attending to affect in practices, before exploring implications for contemporary challenges faced by energy systems.

4.6.1 INSIGHTS FROM AN AFFECTIVE PERSPECTIVE

Cultural conventions of comfort have been widely discussed in energy literatures, expanding discourse beyond technical and physiological specifications. However, in discussions of comfort and energy consumption in buildings, the affective dimensions of practice have rarely been analysed in depth (Vannini and Taggart, 2014). The first assertion builds on affective literature developed in geography, framing comfort as an *affective capacity* (Pile, 2010). Understood this way, comfort becomes more than a physiological or even psychological state; an 'atmospheric attunement' (Stewart, 2011), produced by the coming together of human and non-human elements in the always-emerging, enveloping 'affective atmosphere' of the home (Anderson, 2009). This theoretical framing holds that comfort is a *relational* capacity, flowing and radiating from

the interactions of materials, memories, smells, doings and sayings associated with the home (Pile, 2010; Wallenborn and Wilhite, 2014). Data in this study has shown how, by (1) curating elements, (2) interweaving practices and (3) incorporating dispersed practices into working from home, these relations can be orchestrated by practitioners to produce affective satisfaction.

A second assertion is that an attention to affective sensibilities provides insight into the apparently 'non-rational' behaviours of home workers in relation to energy consumption. Avoiding the use of central heating and achieving comfort by creative means appear to be valuable activities for home workers, carried out to produce affective satisfaction and to define the teleo-affective characteristics of their practice. As such, affect offers a theoretical complement to efforts made by energy researchers using practice theory to move beyond the notion of demand being a result of individual attitudes, behaviour and choice (Shove, 2010).

The third assertion relates to the conduct of research on affective dimensions of practice. If affective satisfaction emanates from the integration of elements in particular spatiotemporal settings (Anderson, 2009), then care must be taken in seeking to capture affective sensibilities in the course of interviews. This study has taken heed of discussions on the methodological challenges of researching affect (Hitchings, 2012; Cresswell, 2012) by considering the staging of interviews as potentially transformative events in the lives of practice. Evidence for this was found in examples of home workers being surprised by aspects of their own accounts, and making adjustments following our first conversations. Emma, for example, is a regular home worker and part time singer. Her band often experiments with the process of song-writing, with Emma improvising lyrics over backing

music. During one such exercise carried out between our first and second interviews, Emma found herself singing about meanings of home and comfort. Having completed the song, she was certain that our discussion two months previous about work, home, comfort and self-management had infiltrated her unconscious, playing out in this affective experiment.

Fourthly, putting affect in the analytical scope, researchers are encouraged to identify the *mechanisms* by which affective sensations are generated. This in turn can help to uncover broader characteristics of practices. Widespread, integrative practices such as work take on different attributes as they are performed in distinct spatiotemporal settings, enrol unique bundles of elements and incorporate dispersed practices. In the case of working from home, comfort, control and flexibility are attributes which help home workers to distinguish the practice from other performances of work, such as those contained in structured, 'thermally monotonous' office environments (Healy, 2008). Understanding how these attributes become established and the role of energy in the process may even help to identify possibilities for steering future configurations of practice towards lower energy consumption (Spurling and McMeekin, 2015). The next section discusses the implications of this range of insights for energy systems challenges.

4.6.2 IMPLICATIONS FOR ENERGY SYSTEMS CHALLENGES

Five implications for the challenges faced by the energy system arise from this paper. These relate to the policy objectives of reducing energy consumption in domestic and commercial buildings and encouraging temporal demand shifting.

Firstly, the sample of home workers overwhelmingly reported a tendency to tolerate lower temperatures when working from home compared with office environments or at other times in the home. Data highlighted that home workers were actively willing to achieve

comfort in creative ways, experiencing affective satisfaction in differentiating their practice from office-based work. While adaptive means of achieving comfort represent a potential source of energy reduction, these creative practices are often invisible to academics and policy-makers; not being captured in energy models for example. Not only does this lack of information make policy design challenging, there are undoubtedly further difficulties to be encountered when thinking through the kinds of measures that might be involved to stimulate adaptive comfort practices. Despite the prevalent use of materials such as hot water bottles and thermal clothing in achieving comfort when home working, policy-makers are likely to be wary of commissioning campaigns to encourage their use (see Wintour, 2013 for a recent example). Nonetheless, further research verifying these adaptive comfort findings would help to build the case for a more expansive policy paradigm, 'more in proportion with the challenges faced' (Spurling and McMeekin, 2015).

A further challenge is that despite evidence of adaptive comfort practices being incorporated into home working, these only bring about net demand reductions if paralleled with flexible energy management practices undertaken by employers. This leads to a second practical implication: the need for employers to develop the capacity to respond to variable occupancy in buildings with flexible heating, lighting and ventilation controls, in order to prevent unnecessary energy services being provided to unoccupied workspaces. Organisational policies are also required to support coordinated schedules and the deployment of technologies such as motion sensors and high quality videoconferencing services. In this sample, only one large public sector employer had implemented these practices. Smaller businesses and those leasing space are likely to face greater difficulty in developing this capacity for flexibility (Parag and Janda, 2014).

Thirdly, evidence from interviews suggested that some home workers valued their days spent at home partly due to the avoidance of a lengthy commute. Quantitative studies have shown that this can lead to significant energy savings. However, where this benefit is incorporated into long term decisions such as where to live, the 'rebound' effect can further serve to offset any positive energy reductions associated with home working (Rietveld, 2011). Targeting employee commuting could be an effective way to reduce environmental impacts associated with working practices, but can be problematic. Carbon footprinting protocols for corporations and public bodies typically exclude commuting from core calculations (World Resources Institute, 2013), while many employers would consider this outside the scope of their responsibility. Given that the net energy consumption of working from home pivots on the commute (Carbon Trust, 2014), there is a strong case for accounting for its length and carbon intensity when negotiating telecommuting arrangements. Exploring the possibilities and pitfalls of tackling employees' commutes is an area that warrants further empirical study (see for example Miyoshi and Rietveld, 2015).

A fourth implication arising from this paper relates to the design of 'smart' household energy systems. This sample of UK home workers all had central heating systems with a condensing gas boiler and individually controllable radiators in each room. However only two respondents would bother to turn down radiators in other rooms when home working, with the remainder preferring to control the heating for the house as a whole, and a majority actively conserving energy by keeping it turned off. The additional effort required to isolate radiators may have encouraged adaptive comfort practices and contributed to the conservation of energy. In coming years, as 'smart' heating systems deployed in domestic buildings allow occupants to control individual radiators with internet-connected

devices, there is potential for *increased* energy consumption (Shipworth et al., 2010). It is the responsibility of social scientists to highlight these contingencies of practice and, as seen in the case of the UK's smart electricity meter rollout, to draw the 'non-rational' tendencies of householders to the attention of policy-makers (Darby et al., 2015).

Finally, the ability and willingness of householders to adapt to signals to shift their consumption over time has economic and environmental implications for the electricity system (DECC, 2015). Working from home represents an opportunity to use energy more flexibly, as the ability to shift demand in the domestic setting has unsurprisingly been shown to be correlated with occupancy (Strengers, 2010). Moreover, this paper has demonstrated that flexibility is a characteristic theme of the practice of home working which is often performed in relation to the use of energy consuming appliances such as washing machines, dishwashers and cookers. Demand shifting is *already* undertaken in performances of home working, producing affective satisfaction and performatively delineating home working from 'normal' work and home activities. Whereas Friis and Haunstrup-Christensen (2016) have highlighted how time shifting of energy demand can 'challenge the temporality of households' routinised everyday practices', this finding highlights the possibility of harmonising demand-response with naturally-occurring flexibility. Targeting home workers with demand response policies may therefore be a fruitful enterprise for electricity suppliers and grid operators, and warrants empirical research.

4.7 CONCLUSIONS

Despite the steady growth in working from home across developed countries, the practice has been under-researched within social scientific energy research since the 'practice turn'.

Most research concerned with energy and home working has focussed on the difficult calculation of net consumption and associated emissions, finding myriad contingent variables. This paper has explicitly drawn on practice theory, using theoretical constructs to aid analysis of ethnographic data. By investigating the meanings, materials and competences associated with home working, and the mechanisms by which the constellation of these elements are configured, characteristics of the practice have been uncovered, with significance for energy consumption and the wider energy system.

This is one of few studies to incorporate the notion of affect into practice-based analyses of energy demand, attending to the experiential dimensions of performance (Cass and Faulconbridge, 2015; Vannini and Taggart, 2014). The analysis benefited from this approach in helping to deepen understandings of comfort, and explain 'non-rational behaviours'. Attending to affect necessitates methodological judiciousness, demanding close appreciation of the emergent nature of interview data and the processes of narrative sensemaking. This theoretical approach also highlights the mechanisms by which affect is produced, through the coordination and interweaving of practices for example, which in turn help to uncover the dynamics of practice and identify potential avenues for change.

In combining ideas from practice theory and discourses of affect, this paper demonstrates the synergies between these conceptual frameworks. This theoretical synthesis has helped to identify three characteristic themes associated with working from home. Comfort, control and flexibility help to construct the practice as a distinct ontological entity, helping to demarcate home working from other forms of work. By analysing these, energy was found to be integral to the practice, being consumed and conserved as home workers tinker with the technologies and materials of their environment, or interweave the use of appliances

such as washing machines with stretches of desk-based work. These findings challenge the idea that convenience trumps energy conservation, or that demand shifting necessarily comes at a cost to householders. With implications for contemporary energy system challenges, these insights cannot be captured by models of household energy consumption, rational economic decision-making or by standardized definitions of comfort.

Working from home has potential to bring about net energy and emissions savings, and is often referred to with optimism in academic and grey literature concerned with sustainable business practice. Aspects of practitioners' performances of home working appliances are crucial in determining the balance of energy consumption. Home workers' tolerance of lower temperatures, the degree of mobility 'rebound' and the incorporation of dispersed practices are key determinants of demand; as is the ability of employers to alter energy management practices. By identifying the nuances of practice which may help to realise this potential, social scientific studies such as this can offer insights to those in a position to steer future configurations of practice, such as policy-makers, regulators and employers.

4.8 REFERENCES

Anderson, A.J., Kaplan, S.A., Vega, R.P., 2015. The impact of telework on emotional experience: when, and for whom, does telework improve daily affective well-being? Eur. J. Work Organ. Psychol. 24, 882–897. https://doi.org/10.1080/1359432X.2014.966086

Anderson, B., 2009. Affective atmospheres. Emot. Space Soc. 2, 77–81. https://doi.org/10.1016/j.emospa.2009.08.005

Banister, D., Newson, C., Ledbury, M., 2007. The Costs of Transport on the Environment - The Role of Teleworking in Reducing Carbon Emissions (Working Paper No. 1024). Transport Studies Unit, Oxford University Centre for the Environment.

Bell, S., Judson, E., Bulkeley, H., Powells, G., Capova, K.A., Lynch, D., 2015. Sociality and electricity in the United Kingdom: The influence of household dynamics on

everyday consumption. Spec. Issue Smart Grids Soc. Sci. 9, 98–106. https://doi.org/10.1016/j.erss.2015.08.027

Bonnington, O., 2015. The Indispensability of Reflexivity to Practice: The Case of Home Energy Efficiency. J. Crit. Realism 14, 461–484. https://doi.org/10.1179/1572513815Y.0000000009

Bryman, A., 2012. Social research methods, 4th ed. ed. Oxford: Oxford University Press.

Carbon Trust, 2014. Homeworking: Helping Businesses Cut Costs and Reduce Their Carbon Footprint.

Cass, N., Faulconbridge, J., 2016. Commuting practices: new insights into modal shift from theories of social practice. Transp. Policy 45, 1–14. https://doi.org/10.1016/j.tranpol.2015.08.002

Cass, N., Faulconbridge, J., 2015. Satisfying everyday mobility. Mobilities 1–19.

Cresswell, T., 2012. Nonrepresentational Theory and Me: Notes of an Interested Sceptic. Environ. Plan. Soc. Space 30, 96–105. https://doi.org/10.1068/d494

Crosbie, T. (Tracey), Guy, S. (Simon), 2008. En'lightening' energy use: the co-evolution of household lighting practices. Int. J. Technol. Manag. 9, 220–235. https://doi.org/10.1504/IJETM.2008.019035

Cunliffe, A., Coupland, C., 2012. From hero to villain to hero: Making experience sensible through embodied narrative sensemaking. Hum. Relat. 65, 63–88. https://doi.org/10.1177/0018726711424321

Darby, S., 2006. The Effectiveness of Feedback on Energy Consumption, A review for DEFRA of the literature on metering, bulling and direct displays. ECI, Oxford.

Darby, S.J., Liddell, C., Hills, D., Drabble, D., 2015. Smart Metering Early Learning Project: synthesis report. DECC, London.

de Dear, R.J., Brager, G.S., 1997. Developing an Adaptive Model of Thermal Comfort and Preference - Final Report on RP-884. ASHRAE Trans. 104.

DECC, 2015. Towards a smart energy system. Department of Energy & Climate Change, London.

Ellsworth-Krebs, K., Reid, L., Hunter, C.J., 2015. Home-ing in on domestic energy research: "house," "home," and the importance of ontology. Energy Res. Soc. Sci. 6, 100–108. https://doi.org/10.1016/j.erss.2014.12.003

Fanger, O., 1970. Thermal Comfort, Analysis and Applications in Environmental Engineering. McGraw Hill, New York.

Flyvbjerg, B., 2001. Making social science matter: why social inquiry fails and how it can succeed again. Cambridge: Cambridge University Press, Cambridge.

Friis, F., Haunstrup Christensen, T., 2016. The challenge of time shifting energy demand practices: Insights from Denmark. Energy Res. Soc. Sci. 19, 124–133. https://doi.org/10.1016/j.erss.2016.05.017

Frontier Economics, 2015. Future potential for Demand Side Response in Great Britain.

Fu, M., Kelly, A., Clinch, P., King, F., 2012. Environmental policy implications of working from home: Modelling the impacts of land-use, infrastructure and socio-demographics. Energy Policy 47, 416–423. https://doi.org/10.1016/j.enpol.2012.05.014

Gabriel, M., Watson, P., 2013. From modern housing to sustainable suburbia: how occupants and their dwellings are adapting to reduce home energy consumption. Hous. Theory Soc. 30, 219–236. https://doi.org/10.1080/14036096.2013.775183

Garabuau-Moussaoui, I., 2014. How People Work and Live in Energy-Efficient workplaces: Logics of actions, social tensions and real issues for occupants in energy-efficient office buildings. Presented at the BEHAVE2014 – Behaviour and Energy Efficiency Conference, Oxford, England.

Garner, C., Sheldon, H., Forbes, P., 2016. Working Anywhere: A Winning Formula for Good Work? Work Foundation:

Gram-Hanssen, K., 2010a. Residential heat comfort practices: understanding users. Build. Res. Inf. 38, 175–186. https://doi.org/10.1080/09613210903541527

Gram-Hanssen, K., 2010b. Standby consumption in households analyzed with a practice theory approach. J. Ind. Ecol. 14, 150–165. https://doi.org/10.1111/j.1530-9290.2009.00194.x

Grunewald, P., 2016. Flexibility in supply and demand. Presented at the Demand Conference, Lancaster.

GWA, 2016. Latest Telecommuting Statistics – Global Workplace Analytics.

Healy, S., 2008. Air-conditioning and the 'homogenization' of people and built environments. Build. Res. Inf. 36, 312–322. https://doi.org/10.1080/09613210802076351

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

Hitchings, R., 2012. People can talk about their practices. Area 44, 61–67. https://doi.org/10.1111/j.1475-4762.2011.01060.x

Huebner, G.M., Shipworth, D.T., Gauthier, S., Witzel, C., Raynham, P., Chan, W., 2016. Saving energy with light? Experimental studies assessing the impact of colour temperature on thermal comfort. Energy Res. Soc. Sci. 15, 45–57. https://doi.org/10.1016/j.erss.2016.02.008

Janda, K.B., 2014. Building communities and social potential: between and beyond organizations and individuals in commercial properties. Energy Policy 67, 48–55. https://doi.org/10.1016/j.enpol.2013.08.058

Kitou, E., Horvath, A., 2003. Energy-related emissions from telework. Environ. Sci. Technol. 37, 3467–3475. https://doi.org/10.1021/es025849p

Latham, A., McCormack, D.P., 2009. Thinking with images in non-representational cities: vignettes from Berlin. Area 41, 252–262. https://doi.org/10.1111/j.1475-4762.2008.00868.x

Lopes, M.A.R., Antunes, C.H., Martins, N., 2015. Towards more effective behavioural energy policy: An integrative modelling approach to residential energy consumption in Europe. Energy Res. Soc. Sci. 7, 84–98. https://doi.org/10.1016/j.erss.2015.03.004

Luo, M., Cao, B., Ji, W., Ouyang, Q., Lin, B., Zhu, Y., 2016. The underlying linkage between personal control and thermal comfort: Psychological or physical effects? Energy Build. 111, 56–63. https://doi.org/10.1016/j.enbuild.2015.11.004

Mann, S., Holdsworth, L., 2003. The psychological impact of teleworking: stress, emotions and health. New Technol. Work Employ. 18, 196–211.

Mason, C.M., Carter, S., Tagg, S., 2011. Invisible Businesses: The Characteristics of Home-based Businesses in the United Kingdom. Reg. Stud. 45, 625–639. https://doi.org/10.1080/00343401003614241

Massumi, B., 2002. Parables for the Virtual: Movement, Affect, Sensation. Duke University Press, London.

McCormack, D.P., 2003. An event of geographical ethics in spaces of affect. Trans. Inst. Br. Geogr. 28, 488–507.

Miyoshi, C., Rietveld, P., 2015. Measuring the equity effects of a carbon charge on car commuters: A case study of Manchester Airport. Transp. Res. Part Transp. Environ. 35, 23–39. https://doi.org/10.1016/j.trd.2014.11.016

Mokhtarian, P.L., Handy, S.L., Salomon, I., 1995. Methodological issues in the estimation of the travel, energy, and air quality impacts of telecommuting. Transp. Res. Part Policy Pract. 29, 283–302. https://doi.org/10.1016/0965-8564(94)00029-A

Nelson, P., Safirova, E., Walls, M., 2007. Telecommuting and environmental policy: lessons from the ecommute program. Transp. Res. Part Transp. Environ. 12, 195–207. https://doi.org/10.1016/j.trd.2007.01.011

Nicol, J.F., Humphreys, M.A., 2002. Adaptive thermal comfort and sustainable thermal standards for buildings. Spec. Issue Therm. Comf. Stand. 34, 563–572. https://doi.org/10.1016/S0378-7788(02)00006-3

Nyborg, S., Røpke, I., 2015. Heat pumps in Denmark—From ugly duckling to white swan. Energy Res. Soc. Sci. 9, 166–177. https://doi.org/10.1016/j.erss.2015.08.021

ONS, 2014a. Quarterly Labour Force Survey - April - June 2014. Office for National Statistics.

ONS, 2014b. Characteristics of Home Workers, 2014. Office for National Statistics.

Parag, Y., Janda, K.B., 2014. More than filler: Middle actors and socio-technical change in the energy system from the "middle-out." Energy Res. Soc. Sci. 3, 102–112. https://doi.org/10.1016/j.erss.2014.07.011

Pile, S., 2010. Emotions and affect in recent human geography. Trans. Inst. Br. Geogr. 35, 5–20.

Powells, G., Bell, S., Judson, E., Lyon, S., Wardle, R., Capova, K., Bulkeley, H., 2015. Fostering active network management through SMEs' practises. Energy Effic. 1–14. https://doi.org/10.1007/s12053-015-9382-y

Reaney, P., 2012. About One in Five Workers Worldwide Telecommute: poll. Reuters.

Reckwitz, A., 2012. Affective spaces: a praxeological outlook. Rethink. Hist. 16, 241–258. https://doi.org/10.1080/13642529.2012.681193

Reckwitz, A., 2002. Toward a theory of social practices: a development in culturalist theorizing. Eur. J. Soc. Theory 5, 243–263.

Rietveld, P., 2011. Telework and the transition to lower energy use in transport: On the relevance of rebound effects. Environ. Innov. Soc. Transit. 1, 146–151. https://doi.org/10.1016/j.eist.2011.03.002

Royston, S., 2014. Dragon-breath and snow-melt: know-how, experience and heat flows in the home. Energy Res. Soc. Sci. 2, 148–158. https://doi.org/10.1016/j.erss.2014.04.016

Schatzki, 2001. Introduction: practice and theory, in: Schatzki, T., Von Savigny, E. (Eds.), The Practice Turn in Contemporary Theory Eds Schatzki, Knorr Cetina, Von Savigny. Routledge, London, pp. 1–14.

Schatzki, T., 1996. Social Practices: A Wittgensteinian Approach to Human Activity and the Social. Cambridge University Press.

Schatzki, T.R., 2010. Site of the Social: A Philosophical Account of the Constitution of Social Life and Change. Penn State Press.

Sdei, A., Gloriant, F., Tittelein, P., Lassue, S., Hanna, P., Beslay, C., Gournet, R., McEvoy, M., 2015. Social housing retrofit strategies in England and France: A parametric and behavioural analysis. Energy Res. Soc. Sci. 10, 62–71. https://doi.org/10.1016/j.erss.2015.07.001

Shipworth, M., Firth, S.K., Gentry, M.I., Wright, A.J., Shipworth, D.T., Lomas, K.J., 2010. Central heating thermostat settings and timing: building demographics. Build. Res. Inf. 38, 50–69. https://doi.org/10.1080/09613210903263007

Shove, E., 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. Environ. Plan. A 42, 1273–1285. https://doi.org/10.1068/a42282

Shove, E., 2003. Converging conventions of comfort, cleanliness and convenience. J. Consum. Policy 26, 395–418. https://doi.org/10.1023/A:1026362829781

Shove, E., Pantzar, M., 2007. Recruitment and Reproduction: The Careers and Carriers of Digital Photography and Floorball. Hum. Aff. 17. https://doi.org/10.2478/v10023-007-0014-9

Shove, E., Pantzar, M., 2005. Consumers, producers and practices: understanding the invention and reinvention of Nordic walking. J. Consum. Cult. 5, 43–64. https://doi.org/10.1177/1469540505049846

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Shove, E., Walker, G., 2014. What is energy For? Social practice and energy demand. Theory Cult. Soc. 31, 41–58. https://doi.org/10.1177/0263276414536746

Southerton, D., 2009. Re-ordering Temporal Rhythms: Coordinating daily practices in the UK in 1937 and 2000, in: Time, Consumption and Everyday Life : Practice, Materiality and Culture, Cultures of Consumption Series. Berg, Oxford, Oxford.

Spurling, N., McMeekin, A., 2015. Interventions in practices: Sustainable mobility policies in England, in: Strengers, Y., Maller, C. (Eds.), Social Practices, Intervention and Sustainability: Beyond Behaviour Change. Routledge, London.

Stern, P.C., 2014. Individual and household interactions with energy systems: toward integrated understanding. Energy Res. Soc. Sci. 1, 41–48. https://doi.org/10.1016/j.erss.2014.03.003

Stewart, K., 2011. Atmospheric Attunements. Environ. Plan. Soc. Space 29, 445–453. https://doi.org/10.1068/d9109

Strengers, Y., 2010. Air-conditioning Australian households: The impact of dynamic peak pricing. Energy Effic. Policies Strateg. Regul. Pap. 38, 7312–7322. https://doi.org/10.1016/j.enpol.2010.08.006

Thien, D., 2005. After or beyond feeling? A consideration of affect and emotion in geography. Area 37, 450–454.

Tomkins, S.S., 1962. Affect, imagery, consciousness: Vol. I. The positive affects. Springer, Oxford England.

Valdorff-Madsen, L., 2014. Can Comfort be Practised? Presented at the 2nd Energy & Society Conference, Krakow, Poland.

Vannini, P., Taggart, J., 2014. Making Sense of Domestic Warmth: Affect, Involvement, and Thermoception in Off-grid Homes. Body Soc. 20, 61–84. https://doi.org/10.1177/1357034X13499381

Walker, G., 2014. The dynamics of energy demand: Change, rhythm and synchronicity. Energy Res. Soc. Sci. 1, 49–55. https://doi.org/10.1016/j.erss.2014.03.012

Walker, S.L., Lowery, D., Theobald, K., 2014. Low-carbon retrofits in social housing: Interaction with occupant behaviour. Energy Res. Soc. Sci. 2, 102–114. https://doi.org/10.1016/j.erss.2014.04.004

Wallenborn, G., Wilhite, H., 2014. Rethinking embodied knowledge and household consumption. Energy Res. Soc. Sci. 1, 56–64. https://doi.org/10.1016/j.erss.2014.03.009

Walls, M.A., Safirova, E., 2004. A review of the literature on telecommuting and its implications for vehicle travel and emissions. Resources for the Future.

Warde, A., 2005. Consumption and theories of practice. J. Consum. Cult. 5, 131–153.

Welz, C., Wolf, F., 2010. Telework in the European Union. Eurofound: European Foundation for the Improvement of Living and Working Conditions.

Wilhite, H., Lutzenhiser, L., 1999. Social loading and sustainable consumption. Adv. Consum. Res. Vol 26 26, 281–287.

Wintour, P., 2013. No 10 says people should consider wearing jumpers to keep fuel bills down. The Guardian.

World Resources Institute, 2013. GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

Zhang, H., Arens, E., Zhai, Y., 2015. A review of the corrective power of personal comfort systems in non-neutral ambient environments. Fifty Year Anniv. Build. Environ. 91, 15–41. https://doi.org/10.1016/j.buildenv.2015.03.013

5. PAPER 2: MAKING SENSE OF ENERGY MANAGEMENT PRACTICE: REFLECTIONS ON PROVIDING LOW CARBON SUPPORT TO THREE SMES IN THE UNITED KINGDOM

5.1 INTRODUCTION

Small and medium-sized enterprises (SMEs) consume more than 13% of global energy (IEA, 2015), and significant opportunities for savings and associated emissions exist (DECC, 2014). However, energy and environmental literacy is low amongst SMEs (Coles et al., 2016), and many fail to take up cost-effective opportunities for efficiency savings (Revell and Blackburn, 2007). A significant literature has developed which addresses the barriers and drivers for energy efficiency investments in different sectors and geographies (Cooremans, 2012; DECC, 2014; Trianni and Cagno, 2011). Comparatively less attention has been paid to the practice of energy management, and this paper reports on a study which set out to investigate energy management practice in SMEs in close detail. Given that for many smaller organisations, energy management tends to be more informal and peripheral than in larger organisations (Sa et al., 2015), it uses a liberal definition of energy management, incorporating mundane activities such as tweaking thermostats, setting timers, paying bills, switching off appliances and making clothing choices. Beginning with the notion that energy facilitates almost *all* business activity, it investigates how its management interweaves with other organising processes.

Data is drawn from the authors' professional experience of providing support to SMEs from 2013-2018. During this period I provided face-to-face support to 52 businesses, with

the aim of reducing their energy usage and environmental impact. When planning this research, I had expected to report insights into (1) how energy is used and managed by SMEs, and (2) how they'd been able to heed my advice and reduce its usage. Against the first objective, in-depth insights into energy management are presented for three SMEs: a business services provider, a charity, and a manufacturer / online retailer. These reveal how energy management practice is woven into organisational narratives and sensemaking processes, and the materialities involved in how these play out. The second objective was more problematic. It became clear over the course of the relationships developed with SMEs that the ways they responded to external advice was unpredictable, unexpected and often resulted in little or no reduction in environmental impact. Analysing research findings revealed as much about the practice of providing low carbon advice and processes of organisational meaning-making, as SME energy management. The study therefore pivoted to focus on each practice in equal measure.

Reflecting this meandering research journey, this paper uses narrative techniques to tell stories not only about the three SMEs as they received information and advice relating to their own energy practices, but also as a way of reflecting on the role of low carbon advisors, who both influence, and are influenced by, the SMEs they support. With an interest in both energy management as a practice, and in processes of organisational knowledge production, the analysis of findings is supported by two conceptual frameworks. Firstly, the concept of sensemaking offers insights into the ways that meanings and norms are produced in organisations (Weick, 1995; Weick et al., 2005). Secondly, concepts from practice theory are used to draw attention to the socio-material nature of knowledge and practice. Both encourage critical reflexivity when conducting empirical

research, and helped to highlight the wisdom of expanding the research focus (Schmidt, 2016).

The next section locates this study in the context of SME energy and environmental literature, and explains how sensemaking and practice theory offer valuable, complementary insights into organisational activity. The methods section explains the processes of sampling and data collection, and reflects on the unconventional application of practice theory. Findings from each SME are then presented in the form of three narratives. The penultimate section discusses the practices of SME energy management, and advice-giving, reflecting on how the theoretical framework helped to uncover surprising characteristics. The conclusion focuses on implications for policy-makers, advisors and the research community.

5.2 LITERATURE REVIEW

5.2.1 ENERGY CONSUMPTION, EFFICIENCY AND ENVIRONMENTAL IMPACT IN SMES

Research on SME energy consumption and environmental performance has come from a number of disciplines and a range of epistemological traditions, with most studies addressing the problem of under-adoption of energy efficiency opportunities. In their thorough review of energy, behaviour-change and organisational literature, Andrews and Johnson (2016) point to a considerable body of work identifying and evaluating barriers and drivers for the uptake of energy efficiency measures, the majority of which identifies financial constraints as the principle barrier, and the prospect of comparative advantage as the main driver (Fleitera et al., 2012; Trianni and Cagno, 2012; Williamson et al., 2006). This literature has been influential in the design of policy instruments for SMEs.

Across the EU, incentives such as grants, loans and the provision of expert advice are available to help businesses overcome financial barriers, and to help demonstrate the case for making efficiency investments (Hampton, 2018a). Typically, publicly funded advisors focus on technological investments such as low energy lighting, low-carbon heating systems, more efficient machinery, or smart technologies (BEIS, 2017a; DECC, 2016; Warren, 2017).

Despite its pervasiveness, the barriers and drivers approach has been subject to criticism. Hampton and Fawcett (2017) raise methodological concerns, pointing to the reliance on surveys and interviews with business owners and managers, who may be more likely to identify financial reasons for inaction, rather than lack of managerial knowledge or other internal factors. Challenges have also been made to the model of decision-making underpinning the barriers and drivers literature, which largely assumes that SMEs will act according to rational economic principles when barriers are removed, for instance, by supportive policy (Banks et al., 2012; Revell, 2007; Revell and Blackburn, 2007). These assumptions have also been contested by empirical research produced for a UK government report, which found that up to 37% of energy efficiency measures required no capital investment, and yet take-up remained low (DECC, 2014).

Drawing on some of the literature cited above, Lutzenhizer (2014) argues that the problematisation of organisational energy consumption and environmental performance has been dominated by the physical-technical-economic (PTE) model. A 'problem frame' has been created which deals with the problem of energy wastage by addressing the physical characteristics of buildings, the efficiency of appliances and the cost-effectiveness of technological measures. This framing marginalises contributions from a wider spectrum

of social sciences which ask more fundamental questions about the role of energy in the context of organisational behaviour and social practices (Powells et al., 2015; Janda et al., 2015). Setting out the scope of an expanded research agenda, Lutzenhiser (2014) calls for more in-depth, qualitative research, including studies drawing on organisational theory and social practices. This paper responds to this call by applying the principles of organisational sensemaking and practice in its analysis.

5.2.2 SENSEMAKING

The concept of sensemaking has been widely used within organisational theory and empirical research, since introduced by Karl Weick (Weick, 1995, 1979). Weick's model conceives of organisations as the outcome of *organising processes,* as they respond to, and make sense of, collective experiences. Sensemaking research attends to how meanings, identities and knowledge are constructed through processes such as retrospection, performative enactments or the telling of stories (Weick, 1995; Weick et al., 2005). The question 'how can I know what I think until I see what I say?' exemplifies the model of performative meaning-making at the heart of sensemaking, and helps to explain why many empirical studies of organisations have used ethnographic methods and narrative accounts.

Currie and Brown (2003), for instance, shadowed hospital middle managers in the UK, attending meetings and conducting interviews to show how the 'confluence' of particular narratives around the notion of patient care served to construct meanings of healthcare practice. Georg and Fussel (2000) conducted another study in a hospital setting, using ethnographic methods to observe how 'organisational greening' was attempted by a dedicated project team. Attending to the emotional dimensions of their participants'

experiences, they show how staff experienced anger, frustration and even shame as they came to discover the scale of environmental impact arising from their organisation. The authors describe the awkwardness experienced by practitioners, as they attempted to reconcile this knowledge with their existing internal narratives relating to their professional practice. Narratives are central to each of these accounts, not only as primary data in the form of stories told by participants, but as a means for describing organisational meaning-making and change.

A microscopic examination of sensemaking processes is provided by Abolafia (2010), who deconstructs policy-making narratives in the US Federal Reserve. Through close analysis of meeting transcripts, he shows that sensemaking is a *recursive* process by which individuals navigate established protocols for decision-making, while applying their own 'logic of appropriateness' to challenges encountered in their own roles. This study shows that the principle of 'plausibility' trumps accuracy, as facts and events are *selectively retained* in collective narratives which fit with established norms and meanings. Abolafia's carefully constructed account demonstrates how an attention to sensemaking can uncover how organisational identities are produced and reproduced.

The tradition of sensemaking primarily considers organisations as discursive constructions, relying on relatively conventional ideas about the nature of knowledge (Nicolini, 2012). There are exceptions within this school of organisational studies however, including Cunliffe and Coupland's (2012) study of a sports team on tour, in which they uncover how *embodied* forms of experience and interaction help to deem social activity as sensible, plausible and acceptable. Despite efforts made by authors such as Harquail and King (2010) to develop a research agenda for the study of embodied cognition in

organisations, this attention to materiality is relatively undeveloped within sensemaking literature. For Nicolini (2012), this is where practice theory can add significantly to the study of organisations. Sharing similar recursive ontological foundations, epistemological frameworks and an empirical concern with observable activity (Lizardo, 2004; Brown et al., 2015), a practice perspective affords greater ontological status to material objects and bodies, and has a longer tradition of attending to the these (Bourdieu, 1977; Shove, 2003; Wilhite, 2008).

5.2.3 PRACTICE THEORY

Practice theory has been extensively applied in organisational studies since the 1990s (Corradi et al., 2010). Feldman and Orlikowski (2011) argue that by moving away from the structure-agency dichotomy, practice theory offers an alternative ontological account of the organisation, as emerging from the doings and sayings that occur within and beyond it. Reflecting on practice theory as an alternative paradigm within organisational studies, they point to examples of research which has reconceptualised *strategising* as a relational and enacted practice (Whittington, 2006; Johnson et al., 2007), and *knowledge* as an ongoing social accomplishment with cognitive and embodied dimensions (Orlikowski, 2002).

Schatzki's contribution to *Organizational Studies* has been influential in emphasising their continually emergent nature. He suggests that organisations are the result of a combination of everyday doings and sayings, and the material arrangements which shape, and are shaped by these (2006). From this viewpoint, an organisation cannot be defined either by the various social practices that take place within its purview, nor the rules, structures and environment in which these are embedded, but is ontologically defined where these two

domains meet (Schatzki, 2005). Schatzki argues that as the recursive relationship between material arrangements and practices endures over time, organisational knowledge becomes embedded and memory is produced (Schatzki, 2006).

Also concerned with organisational knowledge and learning, Gherardi (2009, 2006) points to organisational studies literature prior to the 'practice turn' which discussed the practice of 'knowledge management' in organisations, considering it as a valuable *resource*. In parallel with the conceptual shift from 'organisation' to 'organising' (Clegg and Hardy, 1996), influences from practice theory helped to move attention from 'knowledge' to 'knowing'. Gherardi emphasises the 'renewed conception of knowledge' offered by the concept of practice, foregrounding the role of materiality and distributed agency, and reconceptualising it as continually emergent, dynamic and collaborative (Lave and Wenger, 1991). Developing Schatzki's notion of 'arrangements', Gherardi describes organisations as providing the 'texture of interrelated practices', from which an 'action-net' is formed.

A brief summary of this literature highlights the plethora of terms and concepts used by researchers of organisations and practice theory, which reflects the diversity of practice theory itself (Nicolini, 2012; Spaargaren et al., 2016). Nonetheless, there are significant similarities between each of the accounts cited here and in his comprehensive treatise on practice theory and organisations, Nicolini (2012) helpfully describes five distinctive characteristics shared amongst them all (Table 5-1).

Table 5-1 Nicolini's characteristics of practice theory (2013, p. 6)

Distinctive characteristics of practice theory	Application to investigating energy management practice in SMEs
Questions apparently durable features of our world. Highlights processes of organising which produce apparent stability of social practice.	Assists in delving beneath apparently stable and routinised energy practices.
Forces us to rethink the role of agents and individuals; e.g. managers, the managed, etc.	The PTEM foregrounds technical expertise and its focus on investment opportunities engages with senior staff. An attention to mundane energy management practice considers a wider range of actors and their associated practices.
Foregrounds the body and objects in social affairs.	Attends to the elements of energy management practice, including the materials and embodied knowledge involved in its performance.
Sheds new light on the nature of knowledge and discourse.	Paying attention to how various forms of knowledge (embodied, cognitive, shared) is produced and sustained in organisations, and the influence of external advice.
Reaffirms the centrality of interests and power in everyday practice.	Observing how certain activities or forms of knowledge are produced at the expense of others, asking 'whose interests are served'?

Practice theory has become influential in recent social scientific energy research, being used to highlight how energy use and environmental impacts occur as part of mundane social activity (Shove and Walker, 2014). However, the majority of empirical studies using practice theory have focused on the domestic setting, and few studies have applied the principles of practice theory as set out by Nicolini to research on organisational energy use and management (Lutzenhiser, 2014; Powells et al., 2015). As with every rule there are notable exceptions, and these include Powells et al's (2015) exploration of the potential for flexibility amongst SME practices, and Hargreaves' (2011) ethnographic

study of 'Environment Champions' working within an SME to bring about change in practice. Both demonstrate that practice theory can offer valuable insights into energy related practices in small organisations. However, no study has focused specifically on the practice of energy management in SMEs. Table 5-1 summarises how practice theory is applied to this empirical context in this paper, in accordance with Nicolini's defining characteristics.

In addition to the guiding principles set out by Nicolini, the 'three-element' model is used to support this empirical study (Shove et al., 2012; Shove and Pantzar, 2005). This framework breaks down practices into constituent elements, using the categories *meanings, materials* and *competences* to highlight their diverse socio-material construction (Figure 5-1). The elegant simplicity of the model has attracted a number of energy researchers to use and develop it to support empirical data analysis (Higginson et al., 2015; Spotswood et al., 2015; Kuijer, 2014). Following earlier work by Hampton (2018a), it is used in this study as an interview aid, helping to spark ideas and uncover unexpected insights from respondents as they are provided with a framework to help make sense of their practice. This generates insights into the materials, meanings and competences involved in energy management which would have remained unseen if investigated using the conventional PTE model.

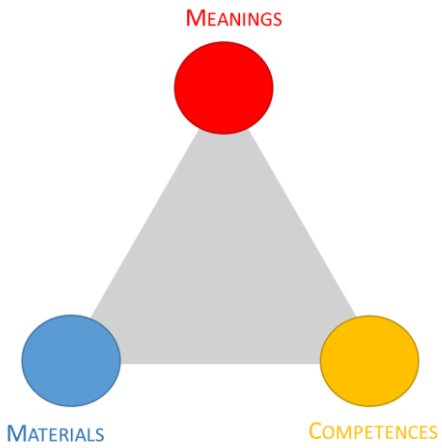


Figure 5-1 - Three element model of practice theory (Shove et al 2012).

5.3 METHODS

5.3.1 BACKGROUND AND SAMPLING

Empirical data for this paper are drawn from the author's experience of providing business support to SMEs from 2013 to 2018. As an environmental consultant I support organisations to review their energy consumption and environmental impact, and provide advice and recommendations for energy, emissions and cost savings. Since November 2013 I have offered these services through publicly funded initiatives which provide up to 12 hours of consultancy support to each SME engaged with.

From a total of 52 businesses supported in Oxfordshire, UK, nine were initially interviewed for this study on the basis that they occupied non-domestic premises; and did not have dedicated energy managers. Each organisation was provided with 12 hours of funded, formal support. However, in the interests of gathering more in-depth data for this study, additional time was spent with each organisation, to develop longer-term relationships.

The study began with the aim of including 10 SMEs in the sample. However, it became clear when reviewing dense findings that a smaller sample would be needed to meet the objective of providing detailed insights into the practice of energy management. Therefore three SMEs were selected for this paper on the basis that they were relatively diverse; representing different sectors, legal structures and building occupancy. The sample includes (1) a business services company (accountancy) which owns and occupies its premises, (2) a charity which occupied part of its site and rented another, and (3) a manufacturer/retailer who occupy their site as tenants. Further details of organisational characteristics are provided Tables 5-3, 5-5 and 5-6. To preserve anonymity, aliases are used for the names of the organisations and interviewees.

5.3.2 DATA COLLECTION: CARBON FOOTPRINTS AND INTERVIEWS

The majority of the initial 12 hours of funded support was used to conduct carbon footprints for each SME. Meetings with senior members of staff were held to identify the main sources of greenhouse gas (GHG) emissions, agree the footprint scope and establish data collection procedures. A site tour followed the meetings, focusing on the main energy-using practices, and to identify any visible opportunities for savings. Electricity and gas consumption data were gathered from supplier bills, compiled in a spreadsheet and converted into the standard metric for footprint assessments: carbon dioxide equivalent (CO_2e). Emissions from vehicles were calculated by combining observed mileage, expenditure on fuels, and the efficiency of the vehicle (where possible based on dashboard data; otherwise based on manufacturer specification). Results were presented to each SME in a report which quantified the main sources of emissions and recommended options for mitigation.

In addition to the meetings and desk-based support provided, semi-structured interviews, lasting 45-60 minutes, were carried out with an individual senior member of staff at least 10 months after the initial carbon footprint assessment was completed. Questions focused on the impact and reception of the report and the elements of energy management practice. In this study, the three-element model diagram was presented to interviewees (Figure 1), who were asked to identify key elements associated with energy management within their organisation, using *meanings, materials* and *competences* as categories (Shove et al., 2012). Participants responded positively to this prompt, drawing parallels with other business practices and using the framework to describe how change might be achieved.

The individuals were chosen as they held significant influence in their organisations, including responsibility for energy management. However, dealing primarily with one individual is a limitation of this study, just as it is a hindrance to low carbon advisors when wishing to bring about wider organisational change (Hampton, 2018b). While each may have had responsibility for energy management, a practice-perspective highlights how energy is used and managed in mundane ways by all organisational actors, and is shaped by the 'texture of interrelated practices' (Gherardi, 2006). Therefore, the ways in which my advice was integrated into organisational norms and meanings depended on how the managers interpreted, responded to and disseminated my findings.

Although they held responsibility for energy within their broad managerial remit, none of the SME managers readily identified as practitioners of energy management. Whether it is necessary for carriers of practice to self-identify as practitioners in order for a practice to be considered as a suitable basis for empirical study is an ongoing debate within

practice theory (Bonnington, 2015; Hitchings, 2012). In energy research, practice theory has been used most notably to investigate overt energy consuming practices such as residential heat comfort (Gram-Hanssen, 2010), laundry (Mylan and Southerton, 2017) and commuting (Cass and Faulconbridge, 2016). Most of these studies use interviews with practitioners who are largely conscious of their activities, and who would agree for instance, that they were actively 'doing the laundry'. By contrast, investigating a peripheral, dispersed practice using interviews with relatively non-reflexive practitioners raises the question of whether their responses can provide reliable, representative evidence.

Hitchings (2012) argues however that *all* interview data should be interpreted as providing only partial insights into practices, which by their nature have tacit, non-cognitive dimensions. Drawing on this observation, Hampton (2017) highlights the artificial, staged nature of the interview and points out that in many of his interviews with home workers, respondents were talking about their practice for the first time. Rather than consider these as limitations of interviews, these moments reveal insights into the processes of sensemaking and knowledge-construction. Further still, in a study of woodland management, Dandy (2016) considers *neglect* as a social practice, demonstrating the ability to analyse environmental management practice without the need to engage with highly reflexive and deliberative practitioners. In light of these contributions, the practice of energy management in this paper is interpreted liberally, allowing the analytical lens to focus on a set of activities carried out by actors who are not required to identify as practitioners.

5.3.3 ACTION RESEARCH AND AUTO-ETHNOGRAPHY

Providing hands-on advice to SMEs, one objective of this research was to support them to reduce their energy use and environmental impact. The empirical research was conducted alongside this professional practice, and therefore may be considered as a form of action research. Denscombe (2014) summarises four characteristics of this approach: (1) *practical* implications; (2) dealing with *processes of change;* (3) involving *cyclical* feedback; (4) and active *participation*. Table 5-2 describes how this research meets these characteristics.

Table 5-2 - Characteristics of action research, based on Denscombe (2014)

Action research characteristic	Relevance to this research
Practical nature	My professional practice and associated research aimed to reduce energy consumption and carbon emissions from participating SMEs.
Processes of change	My role was to assist and guide SMEs through a process of reflexive learning about environmental impact and to support changing practices.
Cyclical feedback	The carbon footprint process involved collaborating on setting scope, drafting the report, and together responding to its recommendations.
Participation	I actively participated in helping SMEs make sense of their own energy management practices. This paper provides reflections on my influence as an external advisor.

Typical of action-research, this paper draws on auto-ethnographic data. Meeting notes from engagements with each of the 52 SMEs were written up and shared with the client. In addition, ethnographic field notes were taken. While Denscombe (2014) highlights the necessity for action-researchers to reflect on their practice with the aim of professional self-development, auto-ethnographic methods require more critical reflexivity (Anderson, 2006). It was through this self-refection that it became clear that this research revealed as

much about the practice of advice-giving as it did the original focus on the practice of SME energy management. Reflections on this practice are provided in the discussion which follows the three narrative accounts.

5.4 FINDINGS: MAKING SENSE OF ENERGY MANAGEMENT

5.4.1 MRC ACCOUNTANCY

Table 5-3 - MRC organisational characteristics

Sector	Accountancy
Number of staff	15
Location	Industrial park on the outskirts of a small market-town.
Building type	Two-storey brick building, pitched roof, built 1990.
Building occupancy	Owner-occupier
Energy supply	Electricity (no gas)
Primary energy services	Space heating (electrical storage heaters); lighting; IT equipment.
Typical working practices	Desk based office work, with occasional client visits.
Business networks	An acknowledged weakness; actively joining business networks.
Self-reported awareness of energy use and environmental impact	Low

MRC are an accountancy firm who occupy the same business premises constructed by their founding directors in 1990. The two-storey building uses no gas, and heating is provided by storage heaters, which is 'topped up' using electric fan heaters on the coldest days. Unusually for a service firm, they operate from a small industrial estate, shared with a builder's merchant, three car mechanics and two tool hire firms.

I first met Matt in 2009 when he was the Bookkeeper for a consultancy I worked at. Staying loosely in touch thereafter, we met again in 2016 when he had joined MRC in a senior

role, tasked with modernising the company, building its brand reputation and diversifying its expertise and client base. The energy and environment goods and services sector is a strategic target for MRC, and the decision to invite me to conduct a carbon footprint was motivated by a desire to better understand their own environmental impact, and in the process, gain knowledge about energy monitoring and environmental technologies. The main findings and recommendations from the carbon footprint process are detailed in Table 5-4.

Table 5-4 - Main findings and recommendations from MRC carbon footprint assessment

Finding	Recommendation
Heating system: • Is controlled in three ways. (1) The 'master timer', in the meter cupboard, which controlled when the storage heaters were turned on; (2) Wall-mounted thermostats; (3) settings on individual storage heaters. • The master timer was set incorrectly. A photograph taken of the timer taken at 15:26 shows that the timer was set to 06:20. This indicates that the storage heaters were being 'charged-up' during the day, and not benefiting from their differential tariff. This was verified using consumption data which showed night-time electricity consumption in winter was *lower* than in the summer. • Thermostats set to 25C, including one which controlled the storage heaters for an open plan office, but had been enclosed into a recently partitioned small meeting room.	• Conduct tests to review and better understand the heating system controls. • Investigate the potential for alternative heating systems in the longer term.

• Staff find storage heaters unresponsive, and frequently open windows or use fan heaters to achieve thermal comfort.	
• Business travel and commuting were significant environmental impacts, while the cost of renting parking spaces was significant.	• Develop a home-working policy, leading to transport emissions savings, and cost savings associated with parking charges.
• Opportunities for energy efficiency include ceiling insulation, lighting, draught proofing windows.	• Invest in low cost efficiency solutions: draught exclusion, insulated ceiling panels, LED fittings.

For Matt, the carbon footprint exercise was part of his personal campaign to modernise the company. It helped to shed light on the out-dated practices which he was looking to change. These included moving the directors away from using paper diaries, introducing a telecommuting policy and cloud-based IT services. Matt described how energy management was part of this bundle of out-dated practices. The storage heaters offered staff very little control over their thermal environment, and the three different offices were frequently either too cold or too warm, and never in sequence with one another. This generated frustration amongst the staff, which was something they couldn't afford:

> 'Because of the competitive nature of our industry. If it's one thing that counts against us, and people might leave, then we need to nip in the bud. It's not something you go for a job interview thinking about, but it's certainly something that makes you think later 'do I want to work here?'. It's deeper than just energy…. It's about how much does our business really care about its people.'

With such strong links to staff retention, Matt explained how the directors each play a role in everyday energy management, with one director responsible for tweaking the settings on the heating system, another for paying suppliers, and all sharing responsibility for listening to staff concerns and discussing investments.

Nine months after the report was submitted, I went back to visit Matt. In the interim, he had been made a director of the company, and had implemented some of his modernisation plans. The reception area had been refurbished, presenting visitors with a smarter entrance; the directors were now using online shared diaries; and they were moving to cloud-based software. He told me that the carbon footprint report had been reviewed by the directors, and while little had changed in their energy management practice: 'the beauty of the report was to give us a bit more understanding, rather than us just talking about the issues amongst ourselves'.

Whilst in the waiting room before our meeting, I asked the receptionist if could take a look at the meter-cupboard and found that the master timer was still set incorrectly. When asked if they'd had their heating settings reviewed, Matt explained that 'we're still trying to get to the bottom of our heating', which remained frustrating and poorly understood. They asked the company who constructed the building nearly 30 years previous to 'come back to tell us about the [storage heater] units, or at least what *they think* they can tell us about the units', but this had led to little or no change. Although MRC had sought external advice on their existing heaters, it was clear they had not systematically reviewed the interactions between the three levels of heating controls, as recommended in my report. Instead, Matt explained that they were fed up with the entire system, and were beginning to gather quotations for new heating technologies, having been given some ideas by other business owners in their industrial park.

At the end of our interview, Matt and I used the three-element model of practice theory to identify the key elements of their energy management practice. The model resonated strongly with Matt, and he used the framework to describe how the *material* elements of

their aging building and heating system were no longer fit for purpose, how their collective *skillsets* were underdeveloped, and that a set of negative *meanings* for staff had resulted. Thinking about how the practice might change for the better, he compared energy management with his recent initiative to introduce cloud-based software:

> 'We were conscious that the *materials* we had were not doing the job, so we changed them. To get them embedded into the culture we needed to give a *reason*, how it fits with the brand. Then we needed to adapt the *skills* with a thought-leadership person like myself: why we were going to do it and what skills we needed across the company.'

Similarly Matt described how for energy management, the introduction of new materials would be the first step, requiring new skills to be developed. A shift of meanings would then follow: from frustration and lack of awareness, to achieving comfort and positive attitudes towards energy saving. Whereas my report had recommended prioritising competences regarding existing materials, Matt favoured the PTE model of change, led by new investments in technology. And why had change not yet happened? It was an awkward question. Although Matt considered energy management to be important, his other modernising initiatives were more closely related to the organisation's core activities of servicing clients and winning new business.

5.4.2 REVIVE

Table 5-5 - Revive organisational characteristics

Sector	Mental Health Charity
Number of staff	57
Location	Locations in several market towns, headquartered in Oxford.
Building type	Café, offices, portacabins and straw bale outbuilding.

Building occupancy	Headquarters: Owner-occupier in one half of main site, and rent other half from NHS. Rent elsewhere.
Energy supply	Electricity and gas. (Only electricity at Portakabin site); small solar array for self-generation at two sites.
Primary energy services	Space heating; cooking and catering; lighting; IT equipment;
Typical working practices	Desk-based office tasks; catering; counselling services; training; wood-working; horticulture.
Business networks	Well integrated into local community and networked with other charities.
Self-reported awareness of energy use and environmental impact	High

Revive are a mental health charity operating throughout Oxfordshire. They help those struggling with mental health issues to develop skills and capacity for entering employment.

I met with Rita, Revive's Finance and Administration Director at their headquarters, which houses their offices, café, shop, garden and workshop. Rita explained that our first project in 2013, when I volunteered to conduct an organisational carbon footprint, was typical of how they work. As a charity, they rely on donations of time, funds, expertise and materials, and making the most of limited resources is at the heart of their culture and everyday practice. Sustainability was a central theme when managing resources, and just as they developed the skills and capabilities of their service-users and assisted them in their recovery, they sought to reuse, upcycle and develop all the material resources available to them.

For Revive, one-off gestures or donations can present challenges thereafter. An array of solar panels had been donated to the charity and installed on their café roof. However, when conducting the footprint assessment, I was told they held no data on the renewable

electricity generated, consumed, or fed back into the grid. The one-off project had been led by volunteers and not integrated into Revive's everyday management practices, and knowledge and information about the panels had dispersed. Similarly, Revive welcomed the construction of an innovative, thermally efficient straw bale building by a group of dedicated volunteers in 2007. However, since then the charity's management team have found that this building material requires regular maintenance, and in the 10 years since its construction they have had to corral volunteers to carry out significant external repairs and roof works.

Rita mentioned that my carbon footprint report had been well-received internally, and by external stakeholders. Revive's communications team had released a press-release, highlighting the positive aspects of their environmental performance which had been highlighted in the report, including local and organic food sourcing, upcycling activities, and their efficient straw bale building. However, when conducting a second report four years later, it became clear that few of the recommendations made in the report had been taken up. Incandescent lightbulbs remained in use, and draughty windows hadn't been sealed. Rita was blunt in blaming lack of external support and funding. They had recently applied for a £5,000 grant to replace all their light fittings, but had disappointingly only received £165. Rita was aware that efficient lighting represented a compelling investment which could pay for itself in a matter of months (Gan et al., 2013), but that right now they were in 'dire straits financially and paying our staff is our number one'.

Rita expressed frustration with the energy efficiency of some of their offices. One half of Revive's headquarters are located in a purpose built, modern and efficient premises, while the other is an older building rented from the National Health Service (NHS) where 'the

windows don't fit properly and the roof vents flap up and down in the wind'. In the NHS building, energy bills are included in their rent, so they have no data or visibility of their consumption. This was seen by Rita as a positive situation:

> 'We're quite lucky that all of our electricity here comes in with our rent. So there is no expenditure for our headquarters and it doesn't tend to go up with our consumption, which is nice, because that's a fixed cost.'

Visibility emerged as a theme for Rita when discussing Revive's environmental impact and ethos of sustainability. When populating the elements of energy management practice using the three-element diagram, Rita identified heating controls and building fabric as prominent *materials*, but preferred to talk about more visible, tangible resources such as waste. On this, she spoke animatedly about their practices of re-use, 'upcycling' and minimising waste going to landfill. In a small organisation, the distinction between the business and personal domains was frequently blurred and their café manager, who runs a smallholding, had started to take home their shredded office paper to use as animal bedding. Becoming impassioned, Rita shared another story of when she was on holiday and her less creative colleagues *paid* to have confidential paper shredded and collected. 'That really sits in my throat', she said.

Whereas the competences involved in energy management were associated with the uninspiring activities of data management, funding applications and turning things off after others, sustainable resource management involved creativity and originality. Like Matt from MRC, the three-element model prompted Rita to draw parallels between energy management and another practice. The new General Data Protection Regulation (GDPR) would mean more energy-intensive paper shredding and would require Revive to dispose of their library of archive tapes. As an example of how this new practice was being

incorporated into Revive's culture of resource efficiency, she told me how a member of staff was 'going to take them and knit them into mats' which could then be sold in their shop.

Whereas most of my questions and underlying assumptions about energy management practice were focused on activities internal to the charity, Rita helped me to realise that this was a simplistic understanding of the nature of the organisation. Using examples of where they had shared excess resources with their network of local charities, and highlighting their reliance on external volunteers, she identified 'community' as a key *meaning* when completing the three-element diagram together.

5.4.3 GIFTIVE

Table 5-6 - Giftive organisational characteristics

Sector	Manufacturing and online retailer
Number of staff	6
Location	Industrial park on the outskirts of a small market-town.
Building type	Two-storey light industrial, pitched roof, built c1980s.
Building occupancy	3-year lease agreement.
Energy supply	Electricity (no gas)
Primary energy services	Space heating, small-scale packing machinery, lighting.
Typical working practices	Assembly line manufacturing; desk-based office tasks.
Business networks	Primarily online, through platforms such as Etsy, Amazon, E-Bay.
Self-reported awareness of energy use and environmental impact	Mixed feelings

Giftive manufacture 'make-your-own' kits for food enthusiasts, helping customers create products such as ricotta cheese, cured bacon and infused gin. Sean started the company in 2013 in his kitchen, during university vacations. He explained to me that despite the

niche nature of his business, it operates in a crowded marketplace, with competitors frequently rebranding and undercutting his innovations. This meant they had to continually develop the Giftive product range in line with fashions and trends. Having doubled revenue every year, the youthful company are now expanding into non-foods, and have opened a manufacturing site in China, where his business partner grew-up. Here they are creating kits to follow the latest trends, which include wall-mounted rainbow-unicorns, and gin themed cross-stitch kits.

Whereas for their first three years, the founding partners had manufactured the kits themselves, working long days in the run-up to Christmas, 2016 saw them become employers for the first time. This marked a significant shift in Sean's daily practice, requiring him to develop a new set of skills: meeting the needs of staff, overseeing the company's financial health, while continuing to innovate in order to grow.

They now have four employees, and Sean told me that managing energy as a business has been strongly influenced by the need to react to the rapid change they've experienced. Our discussion focused on heating as their primary source of energy consumption. During their first winter occupying a light industrial unit, they largely managed without heating, using movement and adrenaline to keep them going. Taking on their first employee made them conscious of the need to provide comfort, and question the suitability of their heating practices, and they bought two electric heaters in winter 2016 which could be 'pointed at' the person who felt the most need for warmth. However, taking on three additional staff in 2017 tested their *ad hoc* solution, which led to a discussion between the directors about the culture of the organisation and its environmental values. Having investigated the option

of providing a propane-based heating system, they instead opted to provide thermal undergarments for all staff.

Sean described how this decision was related to the way the company's culture and identity was unfolding in the course of expansion. Were they like their car mechanic neighbours, whose staff accepted working in outdoor conditions and got their hands dirty, or were they trying to emulate a high-tech start-up, with a youthful culture, complete with office furniture made from pallets? The *meanings* associated with working at Giftive were changing, and this had implications for the various elements of everyday practice. Sean described how these open questions about the organisation were playing out in the ways they thought about, and managed energy:

> 'It's like we're a group of students who all live together. We're all quite young. We're willing to put up with [colder temperatures], whereas if we had an older person, or somebody who is, like, a bit less cool, then we'd have to heat [the space] a bit more… It's like a home, but where the practices are less established. Because we're new. Because we've never ever been in a job or a business before. So we just do things completely our own way, and make it up.'

Being Sinophiles, the two owner-managers also wished to embed some Asian traditions into their organisational culture. Sean conjectured that the decision to buy thermals was related to these efforts:

> 'My business partner wears thermals and is always super warm. It's also probably a Chinese cultural thing too. He comes from a country where it *does* get super cold in the winter and thermals are commonplace. So we decided to buy them from a Japanese company, because in Japan in winter it gets super cold, the same as in China. So maybe it's us taking that culture across.'

Sean explained how energy management became more prominent as a practice during the winter months, but was managed differently during the Christmas rush. He was aware that the electric heaters were expensive to run, but had competing priorities:

> 'When we first got our heaters we would turn them on for two hours at a time, and we would remember to turn them off. We gave up on that, because Christmas is our busy time, so at that time of the year basically anything that makes our life simpler or easier, we just do. So we just turn them on all the time and just leave it.'

Just as Giftive were asking themselves questions about their organisational culture and meaning as they underwent rapid growth, they also had ambivalent feelings about their environmental impact. On the one hand, Sean felt strongly about the need to tackle climate change and reducing the environmental impact from their business, and on the other, felt powerless when thinking about the business as an entity. When asked what his thought the business's biggest environmental impacts were, Sean said:

> 'I think it's the whole concept of the business. Ultimately, we sell packaging. We sell stuff packaged in boxes which doesn't need to be packaged in boxes. People could probably do this for themselves. It's all kind of superfluous, and slightly wasteful anyway, so I think we just… give up on which bits are worse than others.'

Sean described how responding to my questions about energy and environmental impact was the first time he had thought in-depth about these issues, and it made him uncomfortable. Earlier in the interview, we had discussed whether he felt that the carbon footprint associated with air freighting their products was their responsibility, he had insisted that their scope included their own on-site operations, and that transport was the remit of the haulier. However, later in the discussion he said:

'…but I do feel a bit guilty. *You* make me feel guilty about it!'

Undergoing rapid growth, international expansion and operating in a niche market where continual innovation is the key to success, there are open questions for Giftive relating to its culture, purpose and practices. Energy and environmental management practices are bound up in this bundle of sensemaking processes.

5.5 DISCUSSION: ENERGY MANAGEMENT PRACTICE, BUSINESS ADVICE AND KNOWLEDGE PRODUCTION

The three narrative case studies presented above indicate that energy management is woven into the culture and practices of small organisations, and is influenced by the ongoing sensemaking processes which give organisations their character. Energy underpins the doings and sayings of all organisations, and although each SME in this study described its management as a peripheral and non-strategic activity, it becomes clear when seen through a practice lens that it can incorporate meanings, materials and competences which relate to an organisation's core identity.

This discussion is structured into two parts. The first part uses examples from each SME to draw linkages between material elements of practice and processes of organisational knowledge construction. These demonstrate the value of practice theory and sensemaking in helping to provide insights into energy management practice. The second part reflects on the relationship between business advisors and SMEs, including the power dynamics involved in providing expert advice.

5.5.1 ENERGY MANAGEMENT PRACTICE

Underpinned by a 'flat' ontology, practice theory affords prominence to material artefacts, and Nicolini argues that when seeking to understand organisational practices it is often 'the perceived object that bestows actions with continuity, coherence, and meaning' (Nicolini, 2012, p. 225). By focusing on the three elements of practice, each of the accounts above show how material objects were at the centre of the unfolding story of energy management.

For MRC, meanings of frustration and a deficit of competences were imbued in thermostats, timers and ageing storage heaters. Navigating towards an energy management solution became tied up in an existential narrative of change, modernisation and staff retention. Matt was actively seeking to alter the *meanings* embedded in the 'texture' of organisational practices (Gherardi, 2006). Despite the recommendation made to MRC to review the ways that its existing heating system was being used and understood, Matt's preference was for a larger, more comprehensive solution. For him, a major investment in a new technology, as discussed with other local business leaders, would deliver a performative statement about MRC's status as an innovative, modern company. Prompted by the three-element diagram, Matt explained that he thought that an investment in radical, material changes would lead to changes in associated meanings and competences.

Materiality also influences the ongoing construction of organisational identity at Revive, where optimal resource utilisation is at the heart of the charity's ethos, and finding creative means to prevent waste was a practice that staff felt passionate about. The corollary of having materiality at the heart of organisational identity however, was that at Revive, energy was comparatively more peripheral. With energy consumption and costs hidden within their rent, it was *immaterial* for Rita. This seemed to prevent her from prioritising its

conservation when compared with more visible resources such as café and office waste. The stories from Revive help to corroborate the practice-theoretical view that organisations ought not to be considered as fixed entities, but as products of ongoing *organising* processes (Feldman and Orlikowski, 2011; Nicolini, 2012). Making use of donated resources such as solar panels and volunteer time requires agility, and it is through these organising practices that Revive is developing its own culture and memory (Schatzki, 2006).

Giftive is a youthful company, trying to make sense of its rapid growth and establish a corporate identity. Like Revive, this identity was imbued in the materials they handled. Manufacturing 'do it yourself' kits, *bricolage* was at the heart of their organisational practice, and this carried through to energy management (Royston, 2014). Taking the decision to buy their staff thermal garments rather than invest in a propane heating system was a performative gesture, affirming their creative, innovative identity. It is also evidence of energy-related decision making which the conventional PTE model fails to capture. In this case, the problem of meeting staff comfort needs was tackled not by making an energy service more efficient or investing in machinery, but by offering a *sufficient* solution (Thomas et al., 2017). This finding indicates that low-tech means of achieving comfort may be as commonplace for SMEs as they have been shown to be for home workers (Hampton, 2017). Rather than asking 'which are the most cost-effective options for energy efficiency', an attention to practices highlights how the meanings associated with energy were dynamically linked to materials and know-how. At Giftive, clothing, bodies and adaptive comfort were at the centre of energy management practice, elements of practice through which a youthful, kinetic culture was being performed.

For each of these SMEs, narratives revealed how energy management practice is bound up in the continually unfolding processes of organisational meaning-making. The three-element model of practice theory helped to show how organisational identity formation was being played out in material objects and through forms of embodied competences.

5.5.2 THE PRACTICE OF ADVISING SMES

As external providers of expertise, business advisors have a role in constructing new meanings and knowledge for the organisations with which they become involved. When this professional practice is used for research purposes, the action-researcher also has a responsibility to reflect on their influence (Denscombe, 2014).

Gathering energy data, conducting carbon footprint assessments and asking business managers to reflect on their practices in interviews, I was instrumental in bringing certain elements of practice to the fore and influencing organisational sensemaking. Elements foregrounded in this process included *material* objects such as thermostats, clothing and storage heaters, and my probing questions drew out *meanings* of comfort and organisational identity. By enquiring about a seemingly peripheral practice, discussions about organisational *competences* such as data management, heating controls, adaptive comfort and staff morale emerged, often alongside the identification of skills *deficits*. As the relationships continued beyond initial carbon footprint assessments, it became clear that our discussions were leading participants to make connections between energy management and other practices such as human resource management and business development activity. Through these processes, I was deliberately helping to bring the dispersed and disregarded practice of energy management to the fore for each SME.

The carbon footprint assessments and face-to-face advice provided information to the SMEs about how they consumed, conserved and even avoided energy through working practices. Although as a business advisor I had the clear and benevolent intention to help the SMEs manage energy more efficiently, the translation of this was not always predictable. MRC opting to focus on a large-scale investment rather than fully making sense of their failing heating system is an example of how my intervention had been absorbed into Matt's logic of change. While for Giftive, my relationship led Sean to reflect on the relationship between the core activities of his business and its environmental sustainability. Concluding that their products were 'all kind of superfluous, and slightly wasteful anyway', he appeared at the end of our final interview to feel demoralised and demotivated. As a young and environmentally conscious business owner, he struggled with the realisation that energy management would do little to ameliorate the environmental impact arising from his business.

These findings have a number of implications. Firstly, they show that as business advisors become entwined in organisational sensemaking and always-changing practices, outcomes can be unpredictable (Georg and Fussel, 2000; Moss et al., 2008). On the one hand, it may be reasonable to assume that in-depth engagements with SMEs relating to their everyday business practices would lead to greater awareness of their environmental impact and greater motivation to take mitigating action. However, on the other, the relationship between awareness and pro-environmental action is far from clear (Parker et al., 2009; Revell et al., 2010). As Sean's experience illustrates, making sense of organisational environmental impact with the help of an advisor can highlight the *limited* control that its directors possess to effect meaningful change.

Secondly, the MRC directors' preference for large-scale investment corroborates evidence that options for energy conservation involving zero-capital investment are not necessarily the most appealing to business owners (DECC, 2014). This example demonstrates that more important than the content of information, advice or reports provided by external advisors, are the processes by which such resources are absorbed and made sense of by organisations. These processes are unique to each organisation, bound up in its traditions, cultures and established practices (Weick, 1995; Weick et al., 2005; Brown et al., 2015). While this finding might be unsurprising to many social scientists, as an action-researcher and business advisor, it is also frustrating. If each organisation manages energy in unique ways, and absorbs advice unpredictably, does this mean that there can be no scalable solutions to accelerate the energy transition amongst the 5.7m SMEs in the UK? As has been argued elsewhere, such findings indicate that for low carbon business advisors, it is the 'soft stuff that's hard' (Hampton, 2018b). However, rather than resort to PTE approaches, this indicates the need for new forms of energy advice, paying attention to the stories and practices unique to the organisations being supported.

The findings presented in this paper also tell us about the power-relations at play in the industry of energy advice-giving (Lutzenhiser, 2014). As Nicolini (2012) suggests, practice theory can reveal the dynamics of power within and outside of organisations by 'zooming in' on the elements of practice. As discussed above, the majority of energy and environmental advice provided to SMEs takes the form of technical assessments of building efficiency and investment payback calculations, and are influenced by the epistemological traditions of the PTEM (Fleitera et al., 2012; Thollander et al., 2015; DECC, 2015; BEIS, 2017b). These approaches tend to include assumptions about linear, rational decision-making processes, and in turn help to consolidate and extend forms of economic and

technical knowledge production amongst SMEs (Banks et al., 2012; Lutzenhiser, 2014; McCormack and Schwanen, 2011; Revell, 2007). When considered using the three-element model of practice theory, such approaches place emphasis on particular *material* technologies such as heating systems and electrical appliances, and generate a need for highly technical *competences* often external to the organisation. It may be argued that these serve to sustain the collective interests of certain practitioners, such as suppliers of technology, energy consultants and business advisors themselves. By contrast, the findings in this paper suggest that for SMEs to reduce their energy consumption and environmental footprint, management practice needs to be more prominently integrated with the core organising processes which continually define and reproduce the organisation itself. This presents a challenge to the community of SME energy advisors to provide support and advice which is meaningful, comprehensible and relevant.

5.6 CONCLUSIONS

This study initially set out to uncover insights into energy management practice amongst SMEs using practice theory. However, it became clear that the rich, longitudinal findings revealed as much about this as it did about the practice of providing energy and environmental advice to SMEs. This learning process was not accidental, and the expanded focus of this paper resulted from the process of applying its theoretical framework. Just as practice theory and sensemaking focus on organisations *as they happen,* they encourage reflexivity and flexibility from researchers and advisors too (Schmidt, 2016). This paper now concludes by discussing implications for policy-makers, SME advisors and researchers.

When developing policy to address the challenge of decarbonising SMEs, the provision of expert advice is a preferred approach by policy-makers (IEA, 2015). Energy advisors across the EU are funded to spend up to 12 hours with SMEs, aiming to engender more proactive approaches to managing energy and environmental impact (MHCLG, 2018). However, the outcomes of relationships developed between SMEs and advisors cannot be easily predicted. Drawing on auto-ethnographic data and longitudinal advisor-SME interactions, this paper has demonstrated the important but uncertain role that external advice plays in producing knowledge and steering SME practices. Using narrative accounts of energy management practice in three SMEs, it has shown how energy management involves a diverse set of materials, and associated meanings, skills and knowledge which are interwoven with organisational sensemaking processes. Reconceptualising energy management as a dynamic practice helps to explain the chaotic and unpredictable ways in which expert advice is absorbed into organisations. Like tributaries of a flowing river, information about energy consumption and carbon footprints become part of the ongoing, turbulent sensemaking processes from which an organisation's identity and ontological character surface (Nicolini, 2012). For policy-makers seeking to understand how SMEs respond to the provision of energy and environmental advice, these findings may help to explain why take-up of energy efficiency opportunities and behavioural change remains sporadic.

Perhaps influenced by the dominant 'problem framing' of organisational energy management, the practice was initially considered by the SME managers in this study to be a technical activity. It was something that larger businesses may undertake, and none identified themselves as practitioners of energy management. This framing is consolidated by external energy advisors, who typically conduct a technical energy audit, followed by

a business case for one-off investments in efficiency upgrades. As Lutzenhiser (2014) has shown, this conventional approach is influenced by the physical, technical and economic paradigm, which is epistemologically narrow and downplays the role of low-tech materials and tacit knowledge. To make energy advice more *salient* for SMEs (Mallaburn, 2016), advisors must attend to the 'soft stuff' (Hampton, 2018b), including how organisational narratives are constructed. This need not be overwhelming however, and the findings in this paper show the importance of attending to practice *materialities*. For low carbon advisors, this requires an expanded perspective on what materials matter. It is not just heating and lighting systems, nor building fabric that require attention, but clothing, bodies, donated resources and waste.

Powells et al (2015) called for the further application of practice theory to SMEs in the field of energy research. This paper has responded to this call by using the three-element model of practice theory to show how the practice of energy management was characterised by a range of dispersed activities such as tweaking controls, achieving personal comfort or preventing waste. This approach has shown how energy management was bound up in organisational cultures and meanings, these in turn being influenced by material elements and embodied competences.

Practice theory has also been used in this paper more unconventionally, generating insights for future research. Firstly, whereas practice theory has been used to examine energy consuming practices in which interviewees readily identify as practitioners, this paper has focused on three organisations which had not identified energy management as a strategically relevant practice at the start of the advisory relationship. Rather than limiting the value of findings, this led data collection to be an *open, collaborative* process,

whereby respondents were learning, reflecting, and discovering how energy management integrates with the nexus of doings and sayings which constitute their organisation. Secondly, in support of this collaborative process, the three-element model was used in interviews as an aid for SME managers to reflect in new ways on their own practices. By encouraging participants to discover the ways in which they are *already* managing energy, the diagram appeared to enliven respondents, who responded by reflecting on processes of change within their organisations, and by making links with other nascent practices. This method is not only useful for energy researchers, but could also present an alternative approach for energy advisors to engage SMEs in discussions about the 'soft stuff'. This collaborative, pedagogical approach may help to empower SMEs to be more proactive about their energy use and environmental impact. While this paper has presented narratives from three SMEs, further research using ethnographic methods may seek to investigate which practices influence how external advice is received, absorbed and responded to.

5.7 REFERENCES

Abolafia, M.Y., 2010. Narrative Construction as Sensemaking: How a Central Bank Thinks. Organ. Stud. 31, 349–367. https://doi.org/10.1177/0170840609357380

Anderson, L., 2006. Analytic Autoethnography. J. Contemp. Ethnogr. 35, 373–395. https://doi.org/10.1177/0891241605280449

Andrews, R.N.L., Johnson, E., 2016. Energy use, behavioral change, and business organizations: Reviewing recent findings and proposing a future research agenda. Energy Res. Soc. Sci. 11, 195–208. https://doi.org/10.1016/j.erss.2015.09.001

Banks, N., Fawcett, T., Redgrove, Z., 2012. What are the factors influencing energy behaviours and decision-making in the non-domestic sector? A rapid evidence assessment.

BEIS, 2017a. ERDF Case Study Booklet. Department for Business, Energy and Industrial Strategy, London.

BEIS, 2017b. Business awareness and uptake of energy audits. Department for Business, Energy and Industrial Strategy, London.

Bonnington, O., 2015. The Indispensability of Reflexivity to Practice: The Case of Home Energy Efficiency. J. Crit. Realism 14, 461–484. https://doi.org/10.1179/1572513815Y.0000000009

Bourdieu, P., 1977. Outline of a Theory of Practice. Cambridge University Press.

Brown, A.D., Colville, I., Pye, A., 2015. Making Sense of Sensemaking in Organization Studies. Organ. Stud. 36, 265–277. https://doi.org/10.1177/0170840614559259

Cass, N., Faulconbridge, J., 2016. Commuting practices: new insights into modal shift from theories of social practice. Transp. Policy 45, 1–14. https://doi.org/10.1016/j.tranpol.2015.08.002

Clegg, S., Hardy, C., 1996. Organizations, organization and organizing, in: Clegg, S., Hardy, C., Nord, W. (Eds.), Handbook of Organization Studies. Sage, London, pp. 1–28.

Coles, T., Dinan, C., Warren, N., 2016. Energy practices among small- and medium-sized tourism enterprises: a case of misdirected effort? J. Clean. Prod. 111, 399–408. https://doi.org/10.1016/j.jclepro.2014.09.028

Cooremans, C., 2012. Investment in energy efficiency: do the characteristics of investments matter? Energy Effic. 5, 497–518. https://doi.org/10.1007/s12053-012-9154-x

Corradi, G., Gherardi, S., Verzelloni, L., 2010. Through the practice lens: Where is the bandwagon of practice-based studies heading? Through the practice lens: Where is the bandwagon of practice-based studies heading? Manag. Learn. 41, 265–283. https://doi.org/10.1177/1350507609356938

Cunliffe, A., Coupland, C., 2012. From hero to villain to hero: Making experience sensible through embodied narrative sensemaking. Hum. Relat. 65, 63–88. https://doi.org/10.1177/0018726711424321

Currie, G., Brown, A.D., 2003. A narratological approach to understanding processes of organizing in a UK hospital. Hum. Relat. 56, 563–586.

Dandy, N., 2016. Woodland neglect as social practice. Environ. Plan. A 48, 1750–1766. https://doi.org/10.1177/0308518X16651266

DECC, 2016. Potential of Smart Technologies in SMEs. Department of Energy & Climate Change, London.

DECC, 2015. 2010 to 2015 government policy: energy demand reduction in industry, business and the public sector. Department of Energy & Climate Change, London.

DECC, 2014. Research to Assess the Barriers and Drivers to Energy Efficiency in Small and Medium Sized Enterprises. Department of Energy & Climate Change, London.

Denscombe, M., 2014. The Good Research Guide: For Small-scale Social Research Projects. McGraw-Hill Education (UK).

Feldman, M.S., Orlikowski, W.J., 2011. Theorizing Practice and Practicing Theory. Organ. Sci. 22, 1240–1253. https://doi.org/10.1287/orsc.1100.0612

Fleitera, T., Schleich, J., Ployplearn, R., 2012. Adoption of energy-efficiency measures in SMEs - An empirical analysis based on energy audit data. Energy Policy 51, 863–875.

Gan, C.K., Sapar, A.F., Mun, Y.C., Chong, K.E., 2013. Techno-Economic Analysis of LED Lighting: A Case Study in UTeM's Faculty Building. Procedia Eng., Malaysian Technical Universities Conference on Engineering & Technology 2012, MUCET 2012 53, 208–216. https://doi.org/10.1016/j.proeng.2013.02.028

Georg, S., Fussel, L., 2000. Making sense of greening and organizational change. Bus. Strategy Environ. 9, 175.

Gherardi, S., 2009. Knowing and learning in practice-based studies: an introduction. Learn. Organ. 16, 352–359. https://doi.org/10.1108/09696470910974144

Gherardi, S., 2006. Organizational Knowledge: The Texture of Workplace Learning. Wiley.

Gram-Hanssen, K., 2010. Residential heat comfort practices: understanding users. Build. Res. Inf. 38, 175–186. https://doi.org/10.1080/09613210903541527

Hampton, S., 2018a. Policy implementation as practice? Using social practice theory to examine multi-level governance efforts to decarbonise transport in the United Kingdom. Energy Res. Soc. Sci. 38, 41–52. https://doi.org/10.1016/j.erss.2018.01.020

Hampton, S., 2018b. It's the soft stuff that's hard': Investigating the role played by low carbon small- and medium-sized enterprise advisors in sustainability transitions. Local Econ. 33, 384–404. https://doi.org/10.1177/0269094218778526

Hampton, S., 2017. An ethnography of energy demand and working from home: Exploring the affective dimensions of social practice in the United Kingdom. Energy Res. Soc. Sci. 28, 1–10. https://doi.org/10.1016/j.erss.2017.03.012

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Hargreaves, T., 2011. Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. J. Consum. Cult. 11, 79–99. https://doi.org/10.1177/1469540510390500

Harquail, C.V., King, A.W., 2010. Construing Organizational Identity: The Role of Embodied Cognition. Organ. Stud. 31, 1619–1648. https://doi.org/10.1177/0170840610376143

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

Hitchings, R., 2012. People can talk about their practices. Area 44, 61–67. https://doi.org/10.1111/j.1475-4762.2011.01060.x

IEA, 2015. Accelerating Energy Efficiency in Small and Medium-sized Enterprises, Policy Pathway. International Energy Agency, Paris.

Janda, K., Wilson, C., Moezzi, M., Bartiaux, F., 2015. Improving efficiency in buildings: conventional and alternative approaches, in: Ekins, P., Bradshaw, M., Watson, J. (Eds.), Global Energy: Issues, Potentials and Policy Implications. Oxford University Press, Oxford, pp. 163–188.

Johnson, G., Langley, A., Melin, L., Whittington, R., 2007. Strategy as Practice: Research Directions and Resources. Cambridge University Press.

Kuijer, L., 2014. A call for more practice theory on the future, in: Demanding Ideas: Where Theories of Practice Might Go Next. Windermere.

Lave, J., Wenger, E., 1991. Situated Learning: Legitimate Peripheral Participation. Cambridge University Press.

Lizardo, O., 2004. The cognitive origins of Bourdieu's habitus. J. Theory Soc. Behav. 34, 375–401.

Lutzenhiser, L., 2014. Through the energy efficiency looking glass. Energy Res. Soc. Sci. 1, 141–151. https://doi.org/10.1016/j.erss.2014.03.011

Mallaburn, P., 2016. A new approach to non-domestic energy efficiency policy.

McCormack, D.P., Schwanen, T., 2011. Guest Editorial: The Space—Times of Decision Making. Environ. Plan. A 43, 2801–2818. https://doi.org/10.1068/a44351

MHCLG, 2018. Output Indicator Definitions Guidance for the European Regional Development Fund for England, 2014 to 2020 European Growth Programme. Ministry for Housing, Communities and Local Government.

Moss, J., Lambert, C.G., Rennie, A.E.W., 2008. SME application of LCA-based carbon footprints. Int. J. Sustain. Eng. 1, 132–141. https://doi.org/10.1080/19397030802332930

Mylan, J., Southerton, D., 2017. The Social Ordering of an Everyday Practice: The Case of Laundry. Sociology 003803851772293. https://doi.org/10.1177/0038038517722932

Nicolini, D., 2012. Practice Theory, Work, and Organization: An Introduction. Oxford University Press.

Orlikowski, W.J., 2002. Knowing in Practice: Enacting a Collective Capability in Distributed Organizing. Organ. Sci. 13, 249–273. https://doi.org/10.1287/orsc.13.3.249.2776

Parker, C.M., Redmond, J., Simpson, M., 2009. A Review of Interventions to Encourage SMEs to Make Environmental Improvements. Environ. Plan. C Gov. Policy 27, 279–301. https://doi.org/10.1068/c0859b

Powells, G., Bell, S., Judson, E., Lyon, S., Wardle, R., Capova, K., Bulkeley, H., 2015. Fostering active network management through SMEs' practises. Energy Effic. 1–14. https://doi.org/10.1007/s12053-015-9382-y

Revell, A., 2007. The ecological modernisation of SMEs in the UK's construction industry. Geoforum 38, 114–126. https://doi.org/10.1016/j.geoforum.2006.07.006

Revell, A., Blackburn, R., 2007. The business case for sustainability? An examination of small firms in the UK's construction and restaurant sectors. Bus. Strategy Environ. 16, 404–420. https://doi.org/10.1002/bse.499

Revell, A., Stokes, D., Chen, H., 2010. Small businesses and the environment: turning over a new leaf? Bus. Strategy Environ. 19, 273–288. https://doi.org/10.1002/bse.628

Royston, S., 2014. Dragon-breath and snow-melt: know-how, experience and heat flows in the home. Energy Res. Soc. Sci. 2, 148–158. https://doi.org/10.1016/j.erss.2014.04.016

Sa, A., Paramonova, S., Thollander, P., Cagno, E., 2015. Classification of Industrial Energy Management Practices. Energy Procedia 75, 2581–2588. https://doi.org/10.1016/j.egypro.2015.07.311

Schatzki, 2005. Peripheral Vision: The Sites of Organizations. Organ. Stud. 26, 465–484. https://doi.org/10.1177/0170840605050876

Schatzki, T.R., 2006. On Organizations as they Happen. Organ. Stud. 27, 1863–1873. https://doi.org/10.1177/0170840606071942

Schmidt, R., 2016. The methodological challenges of practising praxeology, in: Spaargaren, G., Weenink, D., Lamers, M. (Eds.), Practice Theory and Research: Exploring the Dynamics of Social Life. Routledge, pp. 43–59.

Shove, E., 2003. Converging conventions of comfort, cleanliness and convenience. J. Consum. Policy 26, 395–418. https://doi.org/10.1023/A:1026362829781

Shove, E., Pantzar, M., 2005. Consumers, producers and practices: understanding the invention and reinvention of Nordic walking. J. Consum. Cult. 5, 43–64. https://doi.org/10.1177/1469540505049846

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Shove, E., Walker, G., 2014. What is energy For? Social practice and energy demand. Theory Cult. Soc. 31, 41–58. https://doi.org/10.1177/0263276414536746

Spaargaren, G., Weenink, D., Lamers, M., 2016. Practice Theory and Research: Exploring the dynamics of social life. Routledge.

Spotswood, F., Chatterton, T., Tapp, A., Williams, D., 2015. Analysing cycling as a social practice: An empirical grounding for behaviour change. Transp. Res. Part F Traffic Psychol. Behav. 29, 22–33. http://dx.doi.org/10.1016/j.trf.2014.12.001

Thollander, P., Kimura, O., Wakabayashi, M., Rohdin, P., 2015. A review of industrial energy and climate policies in Japan and Sweden with emphasis towards SMEs. Renew. Sustain. Energy Rev. 50, 504–512. https://doi.org/10.1016/j.rser.2015.04.102

Thomas, S., Brischke, L.-A., Thema, J., Leuser, L., Kopatz, M., 2017. Energy sufficiency policy: how to limit energy consumption and per capita dwelling size in a decent way. Wuppertal Institut für Klima, Umwelt, Energie.

Trianni, A., Cagno, E., 2012. Dealing with barriers to energy efficiency and SMEs: Some empirical evidences. 7th Bienn. Int. Workshop "Advances Energy Stud. 37, 494–504. https://doi.org/10.1016/j.energy.2011.11.005

Trianni, A., Cagno, E., 2011. Energy Efficiency Barriers in Industrial Operations: Evidence from the Italian SMEs Manufacturing Industry. Energy Product. Ind. Partn. Oppor. 12.

Warren, P., 2017. The Potential of Smart Technologies and Micro-Generation in UK SMEs. Energies 10, 1050. https://doi.org/10.3390/en10071050

Weick, K.E., 1995. Sensemaking in organizations, Foundations for organizational science. Thousand Oaks.

Weick, K.E., 1979. The Social Psychology of Organizing. Random House.

Weick, K.E., Sutcliffe, K.M., Obstfeld, D., 2005. Organizing and the Process of Sensemaking. Organ. Sci. 16, 409–421. https://doi.org/10.1287/orsc.1050.0133

Whittington, R., 2006. Completing the Practice Turn in Strategy Research. Organ. Stud. 27, 613–634. https://doi.org/10.1177/0170840606064101

Wilhite, H., 2008. New thinking on the agentive relationship between end-use technologies and energy-using practices. Energy Effic. 1, 121–130. https://doi.org/10.1007/s12053-008-9006-x

Williamson, D., Lynch-Wood, G., Ramsay, J., 2006. Drivers of Environmental Behaviour in Manufacturing SMEs and the Implications for CSR. J. Bus. Ethics 67, 317–330. https://doi.org/10.1007/s10551-006-9187-1

6. PAPER 3: 'IT'S THE SOFT STUFF THAT'S HARD': INVESTIGATING THE ROLE PLAYED BY LOW CARBON SME ADVISORS IN SUSTAINABILITY TRANSITIONS.

6.1 ABSTRACT

Significant public funds are invested in low carbon advisors to support SMEs to reduce carbon emissions on a regional basis. Little research has been conducted on their experiences and practices, nor their place within the context of local business support policy. Findings draw on interviews with 19 advisors in the UK as well as the author's four years' experience as an environmentally focused business support practitioner. Establishing and sustaining engagements with SMEs on the topic of pro-environmental behaviours is a multi-faceted problem. Advisors typically approach businesses with promises of cost savings rather than using environmental messaging, and focus their resources on the provision of building energy audits and technical advice. Advisors rarely engage SMEs in values-based discussions, or by seeking to understand how and why energy is used in the course of everyday business practices. The paper argues that face-to-face meetings could be better utilised if 'softer' skills were deployed alongside technical expertise. It discusses the limitations of growth-focused support in the context of environmental objectives, and calls for a shift in the culture of advice-giving, supported by social scientifically-informed policy.

Keywords: SMEs; middle actors; intermediaries; environmental policy; business support; low carbon transition

6.2 INTRODUCTION

Small and medium sized enterprises (SMEs) make up 99% of all businesses worldwide, use 13% of energy, and may be responsible for 20% of carbon emissions in the UK (IEA, 2015; AXA, 2008)[6]. There is significant potential for SMEs to reduce their energy consumption and associated emissions. For instance, 18-25% energy savings can typically be made through efficiency measures, up to 37% of which require no capital investment (DECC, 2014). However, take up of these cost-effective opportunities is low. Research has shown that owner-managers often perceive their businesses to have little impact on the environment, and consider pro-environmental actions expensive (Revell and Blackburn, 2007). Drivers such as corporate social responsibility (CSR) and environmental legislation have been shown to be less motivating for SMEs than larger enterprises (Williamson et al., 2006; Wilson et al., 2012).

There is wide acknowledgement that the private sector is failing to deliver the energy and carbon savings from SMEs at the speed and scale required to meet national targets for decarbonisation (Committee on Climate Change, 2016). Public policy therefore has an important role in supporting SMEs to reduce their environmental impact (IEA, 2015).

[6] Small and medium-sized enterprises are defined by the European Union as businesses that have fewer than 250 employees and either a turnover of less than or equal to £50 million or a balance sheet total of less than or equal to €43 million (European Commission, 2003).

However, SME groups are typically resistant to conventional 'hard levers' such as tax and regulation (Hampton and Fawcett, 2017). Across the EU, the favoured approach to low carbon policy for SMEs is based on providing incentives such as grant funding and face-to-face support, which is typically implemented alongside conventional business support policy, focused on economic growth and job creation (DCLG, 2015). Although it is acknowledged that SMEs' environmental impact goes beyond their consumption of energy, as the single largest source of emissions, energy attracts the most policy attention and investment of resources. The focus of this paper therefore reflects the focus of low carbon advisors: on energy efficiency opportunities for SMEs.

Within the prevailing incentive-based model of policy, low carbon advisors are shouldered with significant responsibility. Alongside direct grant subsidies, their recruitment, training and deployment represents the largest investment of public funds in supporting SMEs to reduce energy consumption and carbon emissions (MHCLG and BEIS, 2018). This emerging group of governance stakeholders are tasked with engaging and recruiting SMEs to projects; identifying cost-effective investment opportunities; providing expert advice, and encouraging pro-environmental action (Parag and Janda, 2014; IEA, 2015).

Despite significant resources and responsibilities invested in low carbon advisors, they remain significantly under-researched. Little is known about the experiences and practices of delivering low carbon business support to SMEs, nor is there definitive evidence on how best to deliver emissions savings. Although the latter issue is beyond the scope of this study, this paper addresses the former research gap by providing in-depth, qualitative insights into the role of the low carbon advisor. For an *academic* audience, it contributes towards a growing literature concerned with the changing landscape of environmental governance

(Marsden et al., 2014; Turnheim et al., 2018); raising the profile of these actors as important stakeholders for the sustainability transition. It challenges *practitioners* to be creative and ambitious; to develop and deploy 'soft' skills which will both enable them to engage SMEs in values-based discussions, and to focus on *how* and *why* energy is consumed in everyday working practice. Finally, it questions the prevailing design of governance and funding structures, and appeals to *policy-makers* to generate people-centred policy, informed by social science.

The next section describes the state of business support in the UK and reviews academic and policy literature on the role of low carbon middle actors. Section three describes the methods used to gather data for this empirical study. Research findings in section four portray the practice of low carbon advice-giving for SMEs. Evidence shows that supporting SMEs to reduce their carbon footprints is a difficult challenge, requiring agility, salesmanship and a balance of technical and 'soft skills' on behalf of advisors. Participants' views on low carbon policy are also presented. The discussion points out that face-to-face meetings, workshops and local SME networks are expensive options for support provision, and highlights opportunities to make better use of these interactions. The conclusion summarises the implications of this research for low carbon advisors and their funders.

6.3 LOW CARBON BUSINESS SUPPORT

External business advisors are used by over 90% of businesses in the UK (Mole et al., 2017). The majority of advice (75%) is provided by private sector sources, with accountants, customers, business friends and consultants each more likely to be called upon than government agents (Bennett, 2008; Sivaev, 2013). However, most SMEs do

not actively seek advice relating to their environmental performance (Parker et al., 2009). This is partly because owner-managers perceive their businesses to have little impact on the environment, and pro-environment action to be expensive (Revell and Blackburn, 2007; Simpson et al., 2004). SMEs therefore express a strong preference for the free provision of low carbon support (Parker et al., 2009).

The provision of low carbon support for SMEs delivered by the private sector without subsidy is relatively small. Energy services companies typically focus on higher energy consumers (Bertoldi et al., 2006), and sustainability consultants target larger corporations, more likely to have corporate social responsibility (CSR) objectives (Revell et al., 2010). By contrast, Spence (2007) found little evidence for competitive advantage gained by SMEs undertaking CSR initiatives. There is a significant marketplace for assisting SMEs to switch energy supplier, and 85% of UK SMEs are contacted by brokers per year (Lomax and Parry, 2015). However, these intermediaries have little incentive to advise SMEs on reducing demand.

Despite the often compelling business case for investment in energy efficiency, studies have shown that uptake is low amongst SMEs. Energy expenditure makes up a relatively low proportion of average SME operational costs, with 66% and 71% of small businesses reporting spending 10% or less on electricity and gas respectively (Lomax and Parry, 2015). This means that efficiency measures are likely to be a peripheral consideration for SMEs (DECC, 2014). Described as the 'energy efficiency paradox' (DeCanio, 1998), the low uptake of energy and emissions savings opportunities is considered by the UK government and EU to be a market failure (DECC, 2014; European Commission, 2017). Consequently, there is wide acknowledgement that the public sector has a role to play in

providing incentives and support for SMEs to engage in pro-environmental actions (Baranova and Paterson, 2017).

In England, publicly funded assistance for SMEs to reduce their environmental impact is integrated into the broader provision of business support, through Local Enterprise Partnerships (LEPs) and Growth Hubs (Britton and Woodman, 2014). The primary objectives of these organisations are to stimulate growth and generate jobs across the economy (Coutu, 2014; Heseltine, 2012). A large proportion of funding for supporting SMEs comes from EU sources such as the European Regional Development Fund (ERDF), which is overseen in England by the Department for Communities and Local Government (DCLG). Organisations such as LEPs bid for funding for projects which target SMEs with specific objectives including job creation, research innovation or the acceleration of smart technologies (DCLG, 2015).

With environmental concerns rising up the EU policy agenda, one strand of ERDF funding is dedicated to 'supporting the shift towards a low carbon economy'. Worth £580m in the UK over 2014-2020 it includes ring-fenced budgets for promoting energy efficiency and renewable energy generation in SMEs. At the time of writing (December 2017), £99m had been committed to local low carbon projects, each targeting SMEs with offers of low carbon support (MHCLG and BEIS, 2018). Of these projects, a majority offer energy advice and audits and grant subsidies for investment in new energy-saving equipment, although some projects offer other services such as feasibility assessments for the deployment of renewable generation, and the translation of research. *Low Carbon Workspaces* is an archetypal project, offering free energy audits SMEs in Buckinghamshire and Hertfordshire, and grants of 33% towards investments such as low energy lighting,

efficient heating systems or efficient process machinery. The £2.5m project employs four low carbon advisors, responsible for recruiting SMEs, conducting energy audits and advising on emissions reductions opportunities.

6.4 THE ROLE OF LOW CARBON ADVISORS

The important role of low carbon advisors is acknowledged in international policy literature, with a number of government supported organisations producing best practice guidance for funders, managers and advisors. The International Energy Agency's report on 'accelerating energy efficiency in SMEs' sets out a ten-step pathway for programme managers based on case studies from around the world (2015), while the Australian Energy Efficiency Council frames SMEs as 'buyers' of advice and support services, highlighting ways in which energy efficiency can be *sold* by middle actors (EEC, 2016). A UK government study recommends that 'enablers' use accessible language, tailor their approaches to each business, and aim to build long-term relationships (DEFRA, 2006). Addressing an audience of policy-makers across departments, a more recent UK government report identifies insights into organisational decision making, emphasising the importance of engaging with intermediaries in both the private and public sector (DECC, 2016). The report aims to prompt policy-makers to incorporate advisors into their policy design with questions such as 'do you have a sense of what/who the 'trusted sources' are for the organisation(s) you seek to influence?'. Another report for the International Energy Agency puts it more bluntly: 'Go to trusted intermediaries. TRUST IS EVERYTHING.' (Mourik and Rotmann, 2013, p. 10).

Despite the acknowledgement in this policy literature of the importance of local networks and trusted advisors for SMEs, recent academic research has criticised the top-down

framing of these actors, as discrete and passive 'intermediaries', operating between government and small businesses. Janda and colleagues have argued that this fails to accommodate the complexities of their everyday experiences, motivations and working practices (Janda et al., 2014; Parag and Janda, 2014; Killip, 2013). The term 'middle actors' is preferred, as a way of emphasising their independence and refocusing attention onto these stakeholders, who play an increasingly important role in the changing landscape of environmental governance (Janda et al., 2014; Turnheim et al., 2018). A number of studies have identified the role played by builders and installers (Killip, 2013; Janda et al., 2014; Owen et al., 2014; Wade, 2016)*;* as well as landlords and data providers (Janda et al., 2014; Janda et al., 2016). However, much of this research deals with middle actors as influencers of energy consumption in domestic buildings, (O'Keeffe et al., 2016), and a need for further research on SME advisors and business network-facilitators has been identified (Parag and Janda, 2014). This research responds to these calls by focusing on low carbon SME advisors as an increasingly important group of environmental practitioners, playing a crucial role in bringing about a transition to a low carbon economy. While addressing them as middle actors rather than intermediaries may be seen as a matter of semantics, the former phrase helps to emphasise their role as distinctive stakeholders.

The importance of networks is supported with strong evidence in literature on SMEs and the environment, which has found that found that firm-to-firm collaboration and peer learning help to foster pro-environmental actions and energy efficiency investment in SMEs (NCBS, 2006; van Kleef and Roome, 2007; Mallaburn, 2016; EEC, 2017; Lawrence et al., 2006). However, there are few examples of autonomous sustainability-focused business networks, pointing to the need for publicly funded middle actors to promote and

facilitate exchanges between SMEs (IEA, 2015; Mallaburn, 2016). In their study of a Knowledge Exchange programme, North and Nurse (2014, p. 39) highlight the role of the publicly funded advisor, finding from their empirical research that 'what the private sector could not replicate alone was the helpful hand-holding that enables a symbiotic, long term relationship between enthusiastic and committed SME owners and knowledgeable business advisers to develop'. Other research corroborates the idea that networks are successful only if a culture of mutual support and learning can be engendered, requiring a range of 'soft skills' on the part of the middle actor (Bruijn and Lulofs, 2001; Parker et al., 2009; Mourik and Rotmann, 2013).

Little has been written in the academic literature about the best strategies for developing effective, supportive relationships between low carbon advisors and SMEs. However, two distinct approaches can be identified from the small number of empirical studies. The first relates to the importance of personal values in guiding action, and the second attends to existing business practices.

Evidence has demonstrated that SMEs are less likely to follow formal decision making protocols such as cost-benefit analysis than larger firms when taking pro-environmental action (Revell and Blackburn, 2004; Spence, 2007; Banks et al., 2012; Mallaburn, 2016). For smaller organisations, the characteristics of owner-managers are likely to be more influential, with pro-environmental decisions such as investment in energy efficiency likely to linked to the values and preferences of individuals (Hammann et al., 2009; Battisti and Perry, 2011; Williams and Schaefer, 2013). Given this, Schaefer and colleagues (2018) suggest that before trying to persuade SME managers of the need to act on climate change, understanding the values and beliefs of individuals is necessary. They adapt

Schwartz' (2012) value system to develop a typography of SME managers according to their personal and professional values. Whereas previous literature on pro-environmental values from SME managers have tended to make a binary distinction between self-transcending and self-enhancing values (Florea et al., 2013), Schaefer et al point to the wide variety of values which underpin SME approaches to the environment. These include *power* values, where motivations include wealth and efficiency, to *achievement* values, where managers strive for positive, visible outcomes, and *universalism,* where concern for social justice or environmental issues actively motivate individuals. Such contributions towards understanding the values and motivations of SME managers are directly relevant to low carbon SME advisors, whose job it is to engage with a variety of individual business-people. This literature indicates that a key competence for low carbon SME advisors is the ability to engage with business leaders in discussions which go beyond the technical characteristics of energy efficiency investments, to include discussions about organisational values and conversations about the environment. If so, then the character, integrity and competence of business advisors become critical factors for success (Robson and Bennett, 2010).

The second approach emerges from recent usages of practice theory within social scientific research on energy consumption. Authors such as Shove and Gram-Hanssen have helped to shift the focus of research away from the notion of individual behaviour change (Gram-Hanssen, 2010a; Shove and Walker, 2014). With a focus on the practice as the unit of analysis, this theoretical framework has shown how social norms and material infrastructures influence the ways in which energy is consumed, as emissions-producing activities become embedded in everyday activity (Gram-Hanssen, 2010b).

While practice theory has been extensively employed by researchers of energy demand in the domestic setting, few studies have applied it to organisations and working practices (Janda et al., 2014; Powells et al., 2015; Hampton, 2017). Hargreaves ethnographic study of 'environment champions' working within a small UK business is one notable exception (Hargreaves, 2011). Shadowing an internal behaviour change project, he uses practice theory to identify the mundane ways in which energy consumption is embedded in everyday working practices. He argues that a practice perspective can help to identify footholds for change, which may be more effective than appealing to individuals' attitudes or values. Hargreaves' study suggests that a close attention paid to everyday business practices in small organisations may be necessary to bring about effective pro-environmental change.

Also employing practice theory to analyse extensive survey and interview data, Powells et al. (2015) identify opportunities for SMEs to engage in smart grid management through demand side response. The authors argue that while the majority of empirical studies address the organisation as a unit, focusing on business practices can help to identify opportunities for demand flexibility. Moving away from the conventional framing of SMEs as an amorphous population of hard-to-reach, inflexible consumers, an attention to practices can help to identify opportunities for their active involvement in the energy system. Although Hargreaves and Powells et al's studies demonstrate the value of a practice perspective, they also demonstrate the need for extensive qualitative methods in support of their findings. The implications for low carbon advisors are that paying close attention to the mundane ways in which energy is consumed – and could be saved - in organisations requires a commitment of time and attention as well as knowledge of business practices. Additionally, just as values-based engagements require middle actors

to deploy advanced interpersonal skills, practice-led engagements demand a sensitivity to team dynamics and the often contested role that energy plays in organisations (Hampton, 2017).

6.5 METHODS

This study draws on qualitative data from semi-structured interviews with 19 low carbon advisors from the south-east, south-west, north-west, midlands, and east of England. 15 were employed by publicly funded organisations, providing expert advice, energy audits and match-funded grants for SMEs. 13 advisors were part-funded by the ERDF. The majority focused on promoting energy efficiency, although other services offered by participants included feasibility assessments and grants for renewable energy; supporting low carbon innovation through knowledge exchange partnerships between SMEs and universities; and attracting SMEs to diversify into the offshore wind supply chain.

Additionally, four respondents were recruited from the private sector to offer alternative perspectives on the use of public funds for supporting low carbon advisors. These were a business park landlord, an energy broker, and two general sustainability advisors. Each had experience of advising SMEs on environmental sustainability, and were familiar with publicly funded business support services, either in previous roles or having assisting clients with grant applications.

Interview participants were recruited through personal and professional networks. The rate of positive responses was very high, with all but one regional support programmes that were approached putting forward at least one advisor for interview. Participants' experience of advising businesses varied significantly. For three interviewees, their current role was their first professional experience of advising SMEs on energy and environmental

issues, while two participants each had more than 15 years' experience, including providing reports for central government on the issue. The remaining 14 each had between 3-15 years' experience as low carbon advisors in various roles. Of the 19 interviewees, nine were female.

The author has four years' experience of low carbon business support and holds a current position on an ERDF funded project, advising SMEs. Findings below include insights from a carbon footprinting calculation for a printing firm, and from two workshops hosted for SMEs on the subject of 'green growth' (Blundel et al., 2017).

First-hand experience of advising SMEs allowed discussions with interviewees to flow freely, covering themes including advisors' experiences of working within and alongside the growth-focused business support industry; preferred approaches to engaging SMEs; challenges encountered; the skills required for the job; and reflections on the broader policy context. Interviews were conducted from October 2016 – August 2017, lasted between 30 and 60 minutes and were transcribed verbatim. Transcripts were then compiled using a spreadsheet and coded according to emerging themes. Following Bryman's 'steps in qualitative research', interviews and analyses were conducted concurrently, and advisors continued to be recruited to the study until themes and ideas began to recur, reaching 'theoretical saturation' (Bryman, 2012). The findings presented in the following section are organised according to the major themes which emerged.

6.6 FINDINGS

6.6.1 THE MULTI-FACETED CHALLENGE OF ENGAGING SMES ON THE ENVIRONMENT

Representing 99% of businesses, SMEs are extremely diverse. Defined in the EU as organisations with fewer than 250 employees, they vary in size and structure, occupy a range of building types and use energy for a wide variety of different business practices. Table 6-1 categorises quotations from interviews with advisors based on different reasons why it is challenging even to *initiate* engagements with SMEs in publicly funded programmes of business support. These reasons emerged from coding of interview transcriptions. As one manager of an energy efficiency grants programme put it: 'it's amazing how difficult it is to give away money' (RD).

Table 6-1 - The challenges of engaging SMEs with energy and environmental projects

Challenges	Interview Quotations
Heterogeneity	• 'SMEs are not a sector. You have to have a *sector* focus, with special things to make small companies think it is relevant to them.' (GM) • 'Who you're dealing with varies with the size of the business, so the drivers change a bit too.' (RD) • 'We created a system to learn what works for businesses, by opportunity type, by sub-sector, by geography, by intervention type. Not everyone is going to have enough potential to save money or carbon or kWh to warrant them having a one-to-one service.' (NS)
Non-strategic character	• 'People are so busy running their day to day business that they can't find time and can't prioritise it.' (NA) • 'SMEs have such a high workload. Whereas larger organisations might have a fleet manager or equivalent, these things are often a bolt-on to somebody's job. Somebody who is already chocka.' (NA) • 'It's not at the top of anybody's list. The environment can always wait another day, whereas that order that you've got to get out for that customer, or that massive issue you've got with that set of employees, or whatever. They'll always shout louder and be more in someone's comfort zone, and more understood in terms of the risks of inaction and the benefits of action.' (NS)
Defensiveness	• 'You do get people who say 'oh yes, it's fully insulated' because they just want to tell you it is. They are a bit protective, and want to think 'I'm doing everything I can.'' (OR) • 'People always think it's a solution for somebody else. It's for other people. 'I'm not part of the problem''. (SL)
Unclear responsibility	• 'It's nobody's job…. if you're speaking to the MD they don't really know much because it's the finance girls who pay the bills. And the finance girls have no idea what a kWh is or whether the bill is right or wrong, and they probably haven't been doing the readings because that might be a caretaker or facilities guy.' (OR) • 'It's trying to explain to a number of different laymen from various different backgrounds, who maybe aren't the people who make the decision in the first place. Speaking to admin assistants about the programme isn't really the best use of our time! They'll write something down saying: 'Someone from the council rang up'. And then someone says: 'Oh if they're from the council I'm not going to ring them back because they probably want something.' (OR)
Lack of awareness, knowledge and interest	• 'The problem is actually getting businesses on board, because a lot of them don't even know what renewables are.' (GD) • 'A lot of businesses seem to think that it's some sort of scam or catch.' (GD) • 'A company would ideally like a case study of a company *next door to it*, that did *the same thing* but *wasn't a competitor*!' (GM)

	• 'It's not the kind of thing that is at the top of business's list. So a flyer or a poster, or social media - the sort of stuff that works for more traditional business support, is much harder to deliver here.' (NS)

Given the challenges of engaging SMEs with support programmes, marketing techniques and salesmanship were considered crucial for low carbon advisors:

> 'You've got to sell the concept, and you've got to sell the funding - despite the paperwork. Adding the CSR element to it tends to help with the larger businesses. For the smaller businesses it's about how much time they're saving.' (OR)

> 'I used to tell people they had to get their application in by Friday to stand a chance of them getting the grant. Whereas actually they had at least 6 months! It's just applying universal sales techniques.' (JC)

The sales aspect of the role was a source of frustration for some advisors. Most interviewees had been trained in environmental science and policy, and some had not considered the importance of sales skills when taking the job:

> 'There is too much sales in this job I'm afraid.' (OR)

> 'A lot of our officers had come in wanting to work for a charity and didn't have that sales head on. What they would call cold calling: trying to make those initial contacts with businesses. They found it difficult and were sometimes reluctant to do it. Eventually we employed a telemarketer to set up appointments for project officers and then that was a complete turnaround.' (SL)

When describing the language and marketing approaches used in promoting their low carbon projects, *all* respondents described financial savings as being their primary message.

> 'It's pretty basic really - we go on the pound sign. That's how we sell these programmes to businesses. We've come across it time and time again: when we rock up with a clipboard and say we're from the County Council, the shutters come down.' (SC)

> 'You have to make a business case. Whether that's short term or whether that's a strategic business case, you have to sell it in those terms.' (JC)

All the low carbon advisors interviewed for this paper described strong environmental motivations and a passion for sustainable business. However, most advisors suppressed these personal values when engaging with SMEs, expressing scepticism about 'green' messages being effective for motivating their target audience:

> 'We weren't saying: 'you're going to save the planet. People are going to love you'. No. It was about making sense to the business, saying 'you'd be stupid not to do this, because it's going to save you money, help with staff retention, with productivity.' (NA)

> 'Every time I speak to businesses I tell them they can save money, that's the main focus. I know the business is not going to be that interested in being green. Even though they should, it's just one of those things.' (GD)

> "We're looking to imbue the project with our ethics, in everything we do. But there is a sensitivity with respect to marketing, because you're approaching a market which is not necessarily aware or wants to know about reducing their carbon footprints." (BA)

These findings indicate that engaging SMEs with low carbon projects, even where grants and free advice are available, is a significant challenge, requiring targeted marketing approaches and salesmanship. When attempting to make their communications salient for SMEs, this sample of low carbon advisors emphasised cost savings and down-played environmental messages. They assumed that appealing to SMEs' values and sense of

responsibility would be ineffective. The next section describes how, after SMEs are engaged with a project, delivering cost and emissions savings presents another set of challenges for low carbon advisors.

6.6.2 'IT'S THE SOFT STUFF THAT'S HARD'

Once the difficult task of engaging an SME in has been achieved, low carbon advisors face a set of new challenges in delivering emissions reductions. This section describes three challenges emerging from interviews: (1) a wide variety of pro-environmental options are available; (2) evaluating these and measuring impact can be a complex undertaking; and (3) providing tailored, sustained support to SMEs is expensive, time consuming and requires a range of competences.

SMEs can reduce their environmental impact in myriad ways. Replacing lighting, insulating buildings, recycling waste, reducing staff energy use and procuring green supplies are just some of the options available. Evaluating the costs and benefits of each option and measuring their impact requires a level of expertise and investment of time which can detract from the positive intention to take pro-environmental action.

One example of this complexity is illustrated by advice provided by the author of this paper, working with a self-employed advisor to conduct a carbon footprint assessment for a small printing firm. The SME wished to buy carbon offsets equivalent to their operational emissions. From the printer's perspective, becoming 'carbon neutral' was a simple objective: having already signed up to a green electricity tariff and procuring 100% recycled paper, they wished to celebrate their environmental credentials. However, the footprint assessment and offset calculation was far from simple. It is a matter for debate whether purchasing green electricity through a retail tariff can qualify as carbon neutral.

The two advisors consulted guidelines, and exchanged with the SME's green electricity supplier and a third advisor, with no consensus reached on the appropriate methodology.

Further issues arose when the advisors explained to the SME that the carbon benefits of procuring sustainable paper could only be accounted for either at the beginning or end of the product life cycle. This meant the printer could account for *either* the benefits of purchasing from recycled sources, *or* their customers' recycling activities, but not both. Interpreting comprehensive global standards for environmental reporting - whose main subscribers are large corporations – was a challenge for *three* advisors working together, and unsurprisingly led to confusion and frustration from the SME perspective (for a sense of the complexity, see World Resources Institute, 2015 and; Carbon Trust, 2015).

Full organisational carbon footprints were rarely carried out by the advisors interviewed for this study however, and the majority of advisors worked on projects which provided SMEs with environmental or energy assessments and tailored recommendations reports. While acknowledging that collecting energy consumption data, on-site visits and producing comprehensive reports were expensive and time-consuming undertakings, most advisors defended the value of these interventions:

> 'A business might come to us saying we want some new LED lighting, but actually we've found measures such as installing variable speed drives which would cost a fraction of the lighting but would save significantly more money and carbon.' (RD)

> 'We spoke to a firm who just wanted their lights doing, but from speaking a little bit it turned out they do quite a lot of overnight work with their machinery. The compressor was being left on for 8 hours while it wasn't being used. So instead we helped them buy a remote dead-man's switch system.' (OR)

These examples illustrate the value that an experienced advisor can offer in directing efforts and optimising investments. However, most face-to-face visits undertaken by advisors are focused primarily on building characteristics, the technical potential of energy efficiency and payback calculations. Advisors rarely focused their interactions on understanding how energy was consumed and managed in the course of everyday working practices, nor the processes of decision-making unique to the firm. One experienced advisor said:

> 'I've seen 10 billion projects start and fail because all they do is go in and do an audit, write a report, leave a report, walk away. Nothing happens and I get absolutely infuriated because it is *not just information failure*, it's a wider, more complex *market* failure.' (NS)

Most interviewees were aware of these dangers, and agreed with the need to accompany SMEs on a journey from initial engagement through to measurable emissions savings. On the one hand, funding and governance structures appear to be in place to enable the end-to-end support of SMEs. However, on the other, delivering in-depth support appears to be challenging for low carbon advisors, one of whom said: 'it's the soft stuff that's hard'. Interviewees described a set of skills required when attempting to engage businesses in discussions beyond initial assessments and audits, including the need for 'tact', and to 'establish trust and credibility':

> 'You need to ask what the SME wants and learn from them, not just talk to them like they're school children.' (NI)

> 'You actually find you can get better savings and impacts by asking a little three-year old's questions: *'why* do you do it this way; *how* do you do it?'' (OR)

> 'What works is putting an experienced advisor face-to-face with a client, so that the message can be tailored specifically. What works is a *conversation*.' (NS)

These quotations indicate an awareness amongst advisors that paying close attention to mundane business practices can help to identify opportunities for reducing energy consumption or environmental impact. Despite the apparent simplicity of the approaches described, asking basic questions requires confidence, gained through experience. Two senior project managers emphasised that finding and recruiting advisors with extensive business knowledge, management experience and the persuasiveness of a skilled salesman is a significant challenge:

> 'We needed staff who could do the project management and the delivery side of things, working with the businesses. Its two different skillsets together. It's very rare to find someone who's got both of them.' (SC)

> 'Securing that agreement to start a journey, to go and have a look at a business and to identify things that are *not* going well, and things that could be improved, is a *delicate* process to go through. You need advisors who can influence and who can manage change.' (NS)

6.6.3 BEYOND THE 'WIN-WIN': DEVELOPING MEANINGFUL ENGAGEMENTS

Despite the dominance of technical and cost-saving approaches and 'win-win' marketing narratives, several advisors told stories of SMEs investing in technologies where payback periods were only a minor consideration:

> 'That LEDs look nice is a big factor in people's decisions. People like them. The payback period for LED panels might be 4 or 5 years, which is actually quite long. But people see them and think 'oh I want some of them'. (WR)

> 'A lot of them are keen on this environmental stuff. Some businesses you'll visit and see they've done lots of little projects for no apparent business or financial reason, just because they know it's the right thing to do.' (WR)

This finding was corroborated in a workshop hosted as part of this research, where an SME owner-manager explained how cost failed to capture the full range of motivations for their pro-environmental actions:

> 'We decided we would invest in renewable technology because if nobody ever did it then there would be no research, no economic drive to develop that technology. So it was a loss leader. No, not a loss leader. It was a loss. But we decided we would make that sacrifice. Solar panels, wood-chip boiler. Not an easy ride. But we decided because we were in a position where we can do a little bit, we would put something into the system for future generations.'

With evidence of SMEs diverging from the principles of rational economic decision-making, advisors felt that developing personal connections with SME owner-managers should be a priority. However, only a small number of interviewees described cases in which they had managed to discuss the *meanings* of sustainability or the *purpose* of energy in the context of organisational culture and everyday business practices.

One advisor worked on a project which hosted workshops for SMEs on different aspects of sustainable business, ranging from energy efficiency to the benefits of active travel for the environment and staff wellbeing. This advisor was wary of the tendency within environmental advocacy to over-emphasise the benefits of pro-environmental action without acknowledging its costs. Sceptical of the effectiveness of presenting a series of successful case studies, she emphasised the importance of *learning stories* (Janda and Topouzi, 2015):

> 'It wasn't just 'sustainability is wonderful, it's a great thing to do (if you have endless money and time!)'. It was: 'the reality is we had to slug away, but you can learn from our experience and not have to repeat the same thing.' (NA)

Despite possessing strong environmental values themselves, advisors felt that it was more challenging to engage SMEs when the focus of the discussion was on organisational culture and values, as opposed to technical assessments. One advisor said: 'it's really hard to talk to someone about that softer side if that's not what you're there for'. This finding suggests that the framing of initial engagements with SMEs then influences the nature and scope of the conversations when visits are carried out. The ubiquity of cost-based, technology focused marketing approaches makes it difficult for advisors to turn discussions towards values and corporate responsibility. However, the same advisor indicated that while conducting an energy audit, he could gauge whether the SME could be recruited to a sister project. Guiding a cohort of SMEs through bronze, silver and gold awards for environmental management, he referred to this 'warm audience' as being more amenable to more abstract questions. 'Asking open questions and taking the blinkers off a little bit', allowed advisors to 'tease' the SME into the programme, and from there 'the key is getting it from awareness, through to action, to advocacy' (OR).

In attempting to develop deeper relationships with SMEs, another advisor attempted to incorporate energy and carbon savings as part of providing broader business support. This included identifying the co-benefits of pro-environmental action. Their project included helping SMEs to increase wellbeing amongst their staff, which they delivered alongside advice on energy efficiency, transport and procurement:

> 'Organisations do think holistically; they don't just think 'I'm going to work on my transport now'. A number of people said it was the wellbeing thing that brought them in.' (NA)

This advisor emphasised how the wellbeing agenda helped to establish a lively and supportive culture amongst businesses signed up to the project; helping to move away from a 'vision of sustainability which has become 'thou shalt not do this''. Ambitiously, the same advisor also ran a workshop which posed some fundamental questions to SME owner-managers: 'why did you start, what were your initial values, and how are you aligning those with how you're financing your organisation and your procurement.' Reflecting on this, she said:

> 'We were trying to line up people's values with business. Why do they go into business? Usually they're individual people or a family who are really passionate about something and they start a company. But then often their values drop away over time because of the demands of business. They might want to grow, and they might 'sell out'. There are lots of challenges around that… it was a tough workshop. You could tell how challenging it was for people because their morals were saying 'what I'm doing is at odds with why I started the company, or my personal values, but I see no other way of negotiating the system.' (NA)

This quotation indicates that in the view of this advisor, balancing business growth and personal values can cause tensions for SME owner-managers. This raises questions over the effectiveness of integrating low carbon support into conventional provision of growth-oriented business support. The next section presents findings on this policy context.

6.6.4 REFLECTIONS ON BUSINESS SUPPORT POLICY AND THE LOW CARBON AGENDA

Most publicly funded SME low carbon advisors in the UK are funded by the European Regional Development Fund, and their roles are heavily influenced by the broader policy context associated with its strategic objectives, rules and governance structures.

In ERDF jargon, providing low carbon support to businesses is one of nine 'Priority Axes', which together aim to 'support economic growth and job creation in order to reduce… regional economic disparities within the EU' (DCLG, 2015). Economic development narratives pervade the governance and design of low carbon SME initiatives (Britton and Woodman, 2014), which for several low carbon advisors, was a complementary combination:

> 'They go hand in hand. Every pound you save on energy you can use on something else, which grows the business. Helping people with that initial capital outlay is really good for growth.' (JC)

> 'Our LEP is all about jobs and growth. Those are their priorities. We've seen an opportunity with the low carbon sector, where if we grow that sector, we are going to get jobs and of course growth.' (SC)

Other advisors identified problems with the integration of low carbon goals into a system primarily set up to deliver economic growth. These include skewing the reach and impact of low carbon projects; and being tasked with delivering inappropriate outcomes:

> 'There is a lot to be said for getting growing companies interested because they may become the next big ones and they will be trend setters. But a lot of companies don't have any wish to grow. Local shops for example. Those are the ones who are neglected by policy.' (GM)

> 'It's job-creation obsessed. But we are not a programme which is primarily about driving job creation! We *have* actually created and safeguarded loads

> of jobs on the back of what we do, but that's when we're allowed to look at the risk side of things.' (NS)

Despite a UK government report in 2006 recommending an increase in awareness of environmental and sustainability issues across all organisations engaging with SMEs (DEFRA, 2006), it is clear more than a decade later that a lack of familiarity persisted amongst funders, business support organisations and other generalist advisors:

> '[Previously] working with [business support] organisations... they always said sustainability or environment was a golden thread through everything they did. Like hell it was! They didn't know the first thing about it! (GM)

> 'We [advisors] take [sustainability principles] for granted, but sometimes you have to be very basic about how you go about explaining things with funders. It's a constant struggle in all honesty.' (SC)

> 'We're reliant on all the different advisors who sit in front of a business, for example the economic development officers in the district, or a mental health team. In theory our offer is the same around the region. It should be easy. But what does differ is on the local scale, who is around to deliver that offer, who is around to support'. (OR)

6.7 DISCUSSION:

Nearly 15 years ago, Revell and Rutherfoord argued:

> 'Little has been written about the structural factors that influence small firm environmental practices. The environmental performance of small businesses cannot be solely attributed to characteristics inherent within them; it is also related to the way in which societies influence and engage with business – and the way in which business is incorporated into the environmental policy agenda'. (2003)

Since then, societal expectations of small firms have gradually shifted. Increases in the UK national minimum wage have far outstripped inflation, and minimum pensions contributions have been introduced for all employing businesses. SMEs' environmental responsibilities remain low however. Incentive-based programmes of support are favoured over environmental regulation or taxation, meaning that low carbon advisors play a central role in the way that SMEs engage with the environmental agenda.

6.7.1 LIMITS TO THE GROWTH PARADIGM

Low carbon projects in the UK are typically integrated into conventional models of business support, set up primarily to support SMEs to grow, export and create jobs. Consequently, the reach of advisors is skewed towards well-networked, growth-oriented SMEs (Open University, 2013), and their principal strategy for promoting projects is on cost grounds. There are several drawbacks of these approaches.

Firstly, it is inevitable that low carbon projects cannot reach all SMEs in a geographical area given the heterogeneity of the business population and limited resources. For cost-effective emissions reductions, projects would ideally target SMEs based on energy usage and its over-consumption, rather than organisations' growth plans or ability to network. A large proportion of SMEs have business models which prioritise stability over growth, and these have been intentionally neglected by business support initiatives in the past (Blackburn, 2012). However, it is possible that long-established, family-run businesses are more likely to own and occupy older buildings with significant energy efficiency potential. This hypothesis warrants empirical testing, and emphasises the need for improved data on SME energy consumption (Hampton and Fawcett, 2017).

Second, the energy efficiency 'paradox' describes how the financial case for making energy efficiency investments is often compelling without the need for public subsidy, and yet opportunities are under-exploited by SMEs. Public investment in low carbon support for SMEs is justified on the basis of market failure, and the recognition that rational economic assessments are insufficient to motivate action. Given this policy context, it is ironic that all the low carbon advisors in this study promote their projects to SMEs on cost grounds above all else. This may be seen as another kind of paradox, cutting against the overarching logic for policy intervention.

Thirdly, the majority of low carbon projects offer match-funded grants to SMEs to encourage making new purchases, despite 37% of all energy efficiency opportunities requiring zero capital investment (DECC, 2014). In some cases, replacing functioning equipment with newer, more efficient models may not deliver significant carbon emissions savings. For instance, replacing an aging condensing boiler may deliver marginal efficiency gains which are partially offset by its embodied carbon footprint, and 'lock-in' the organisation over the longer-term to fossil-fuelled heating.

Fourthly, embedding low carbon projects in growth-focused funding regimes can lead to inappropriate and distracting targets being set. Net job growth, numbers of businesses awarded grants, and gross-value added are the principle measures by which projects funded by the ERDF are assessed, and the methodologies and reporting requirements are specified in policy documentation in detail. By contrast, there is just a single target relevant for low carbon initiatives: 'estimated GHG emissions'. Advisors are left free to design their own methodologies for this, which are only loosely audited (Hampton, 2016).

Finally, the dominance of the cost-saving, minimum hassle narrative adopted by low carbon projects can *preclude* other approaches. Reaching out to SMEs using cost saving and technology focused marketing messages can make it difficult for advisors to pivot their approach and tackle what one advisor called 'the softer stuff'. This includes paying attention to *how* and *why* energy is used by the client organisation, as well as raising deeper, searching questions relating to organisational values and appealing to individual owner-managers' sense of responsibility in order to foster pro-environmental action.

6.7.2 OPPORTUNITIES FOR A NEW CULTURE OF ADVICE-GIVING

Seeking to reduce carbon emissions from SMEs, funders, project managers and low-carbon advisors favour face-to-face meetings, the provision of workshops and on-site energy audits, despite the high costs associated with these approaches. The majority of interactions between advisors and SMEs are *technical,* focused on buildings, payback assessments and the identification of 'quick-wins'. Although significant energy and emissions savings can be made from upgrading technology and improving the energy performance of buildings, more could be made of face-to-face meetings. Firstly, these unique engagements could be more effectively exploited to engage owner-managers in more meaningful and far-reaching conversations about personal and organisational values. These include attitudes towards corporate responsibility as a whole; their organisation's founding principles and values, and its long-term role in an environmentally sustainable society.

Findings from interviews and participant observation demonstrated that advisors themselves had strong environmental motivations, and recognised that where they are able to develop personal relationships, SME pro-environmental action is likely to be sustained

in the longer term. However, engaging businesses in values-based discussions was a significant challenge, requiring advisors to have a range of skills in order to establish trust and buy-in from SMEs, which can take time. As one advisor suggested, technically focused energy assessments and the prospect of financial support may be effective in initiating relationships with SMEs; the next stage is to recruit businesses to join low-carbon networks and start the journey from *awareness*, to *action*, to *advocacy*. Typographies of SME managers' values, such as in Schaefer et al. (2018), could be instrumental in supporting advisors to target their approaches.

A second opportunity to enhance the effectiveness of face-to-face meetings is by following the examples of Hargreaves (2011) and Powells et al. (2015) in paying close attention to the mundane ways in which energy was consumed in the course of everyday business practices. As Hargreaves demonstrates, paying close attention to the meanings, materials and competences of practices can be an effective way of identifying opportunities for behaviour change and emissions reductions in businesses (2011). For the low carbon advisor, such approaches would involve seeking to understand how energy is managed on a day to day basis by an SME, its geographical and market context, and the priorities of, and pressures faced by its Directors. In practice, this approach may not be as difficult as it appears. As one advisor suggested, 'you actually find you can get better savings and impacts by asking a little three-year old's questions: '*why* do you do it this way; *how* do you do it?''. With ample funding already in place across the EU for face-to-face visits, these approaches warrant practical experimentation from publicly funded advisors.

Academic researchers also have a role to play in developing a new culture of advice-giving. Andrews and Johnson (2016) have recently pointed to a significant gap in social

scientific research relating to energy use in organisations. This is especially true for SMEs, where more qualitative studies are needed to support low carbon advisors on the 'softer' side of their role. Further studies in the mould of Hargreaves' 2011 ethnography would help to demonstrate the value of attending to everyday businesses practices, from which opportunities for energy and emissions savings can emerge. Improved understanding of how energy is used and managed by SMEs, how decisions are made, and what motivates owner-managers towards pro-environmental action will help low carbon advisors to be more effective in facilitating change.

6.8 CONCLUSION

Reducing carbon emissions from the SME population is a significant challenge, and it is widely acknowledged that the private sector market for low carbon goods and services will not deliver reductions in line with the targets set under the Paris Agreement. The need to effectively tackle climate change is challenging extant models of environmental governance, and new stakeholders are emerging at multiple-levels. Across the developed world, public money is invested in specialist advisors, who offer low carbon support to SMEs through energy audits, face-to-face meetings and by recommending efficiency investments. Part of a shifting model of environment governance, this community of practitioners is playing an increasingly important role in the transition towards a low carbon economy.

Contributing to a growing literature concerned with new styles of environmental governance and emerging stakeholders, this paper has addressed a gap relating to the role of low carbon advisors. It is the first study to provide in-depth insights into their practices and experiences, giving voice to these critical middle actors. Findings have

shown that advisors face myriad challenges: in engaging SMEs with low carbon projects; identifying and evaluating a wide variety of pro-environmental actions; bringing about lasting change in organisational practices and culture; and working within the context of conventional business support policy.

The current approach of low carbon advisors when engaging with SMEs is to focus on buildings, technologies, payback periods, and to assist with the purchase of new equipment. However, framing pro-environmental actions as 'win-win' and 'no brainer' opportunities serves to *side-line alternative* engagements. These include more in-depth conversations about organisational culture, corporate responsibility, values, risk, and understanding what energy is used *for*. As social scientific energy research has shown, understanding energy demand in the context of everyday practices is a pre-requisite for lasting change.

Funding advisors to support SMEs through face-to-face meetings and ongoing specialist advice is an expensive policy option, and this paper has suggested that for more meaningful and effective engagements, a change in the culture of low carbon advice-giving is required. Cost-saving, technical narratives may be successful in engaging SMEs initially; thereafter, advisors have a challenging task of combining their technical skills with softer, inquisitive and persuasive competences, with a view to starting SMEs on a journey towards reduced environmental impact. However, findings from interviews suggested the breadth of skills required for such wide ranging, yet in-depth, engagements is unlikely to be found in any one advisor. This presents a recruitment challenge for programme-managers, and raises wider questions relating to the skills required to deliver the low carbon transition.

The policy context within which low carbon advisors operate poses many challenges. Low levels of environmental competence amongst policy stakeholders; misaligned targets; artificially compartmentalised funding rules; short timescales for funding; and the frequent restructuring of business support governance each hamper advisors' capacity to deliver low carbon objectives. Given the scale of SMEs' environmental impact and the preference for incentive-based policy over regulation and taxation, low carbon advisors are shouldered with enormous responsibilities. Despite the best efforts of talented and widely-skilled individuals, the current provision of low carbon business support in the UK is unlikely to deliver emissions savings in line with national decarbonisation targets. These middle actors deserve to be supported by people-centred policy with a broader scope than the growth-oriented model of conventional business support. By providing an in-depth account of their practices, this paper has provided the foundations for more research, debate and policy development.

6.9 REFERENCES

Andrews, R.N.L., Johnson, E., 2016. Energy use, behavioral change, and business organizations: Reviewing recent findings and proposing a future research agenda. Energy Res. Soc. Sci. 11, 195–208. https://doi.org/10.1016/j.erss.2015.09.001

AXA, 2008. SMEs Responsible for 110 Million Tonnes of Carbon Emissions Each Year [WWW Document]. AXA UK. URL http://www.axa.co.uk/newsroom/media-releases/2008/smes-responsible-for-110-million-tonnes-of-carbon-emissions-each-year/ (accessed 11.15.17).

Banks, N., Fawcett, T., Redgrove, Z., 2012. What are the factors influencing energy behaviours and decision-making in the non-domestic sector? A rapid evidence assessment.

Baranova, P., Paterson, F., 2017. Environmental capabilities of small and medium sized enterprises: Towards transition to a low carbon economy in the East Midlands. Local Econ. 32, 835–853.

Battisti, M., Perry, M., 2011. Walking the talk? Environmental responsibility from the perspective of small-business owners. Corp. Soc. Responsib. Environ. Manag. 18, 172–185. https://doi.org/10.1002/csr.266

Bennett, R., 2008. SME Policy Support in Britain since the 1990s: What have We Learnt? Environ. Plan. C Gov. Policy 26, 375–397. https://doi.org/10.1068/c07118

Bertoldi, P., Hinnells, M., Rezessy, S., 2006. Liberating the Power of Energy Services and ESCOs for the Residential Sector in a Liberalised Energy Market. Presented at the EEDAL, London.

Blackburn, R., 2012. Segmenting the SME market and implications for service provision: a literature review. Res. Pap. Ref 9, 12.

Blundel, R., Fawcett, T., Shaw, C., Hampton, S., Westall, A., 2017. Growing green?: co-creating an evidence-based model of SME engagement. Presented at the ISBE Annual Conference, Belfast.

Britton, J., Woodman, B., 2014. Local Enterprise Partnerships and the low-carbon economy: Front runners, uncertainty and divergence. Local Econ. 29, 617–634. https://doi.org/10.1177/0269094214548664

Bruijn, T. de, Lulofs, K., 2001. Promoting environmental management in Dutch SMES: policy implementation in networks. Presented at the Workshop Voluntary, Collaborative, and Information-Based Policies, Cambridge, MA USA.

Bryman, A., 2012. Social research methods, 4th ed. ed. Oxford: Oxford University Press.

Carbon Trust, 2015. Scope 2 Reporting Guidance – the dawn of a new era for green electricity?

Committee on Climate Change, 2016. Next steps for UK heat policy. Committee on Climate Change.

Coutu, S., 2014. The Scale-Up Report on UK Economic Growth (An independent report to the government).

DCLG, 2015. European Regional Development Fund Operational Programme 2014 to 2020. Department for Communities and Local Government, London.

DeCanio, S.J., 1998. The efficiency paradox: bureaucratic and organizational barriers to profitable energy-saving investments. Energy Policy 26, 441–454.

DECC, 2016. ORGANISER: A behavioural approach for influencing organisations. Department of Energy & Climate Change, London.

DECC, 2014. Research to Assess the Barriers and Drivers to Energy Efficiency in Small and Medium Sized Enterprises. Department of Energy & Climate Change, London.

DEFRA, 2006. Encouraging Sustainability Amongst Small Businesses (Behaviour Change: A Series of Practical Guides for Policy-Makers and Practitioners No. 9). Department for Environment, Food and Rural Affairs.

EEC, 2017. SMEs and community organisations: enabling best practice energy efficiency. Energy Efficiency Council.

EEC, 2016. Connecting SMMs with expert energy efficiency support. Energy Efficiency Council.

European Commission, 2017. Good practice in energy efficiency.

European Commission, 2003. COMMISSION RECOMMENDATION concerning the definition of micro, small and medium-sized enterprises, Official Journal of the European Union.

Florea, L., Cheung, Y.H., Herndon, N.C., 2013. For All Good Reasons: Role of Values in Organizational Sustainability. J. Bus. Ethics 114, 393–408. https://doi.org/10.1007/s10551-012-1355-x

Gram-Hanssen, K., 2010a. Residential heat comfort practices: understanding users. Build. Res. Inf. 38, 175–186. https://doi.org/10.1080/09613210903541527

Gram-Hanssen, K., 2010b. Standby consumption in households analyzed with a practice theory approach. J. Ind. Ecol. 14, 150–165. https://doi.org/10.1111/j.1530-9290.2009.00194.x

Hammann, E.-M., Habisch, A., Pechlaner, H., 2009. Values that create value: socially responsible business practices in SMEs–empirical evidence from German companies. Bus. Ethics Eur. Rev. 18, 37–51.

Hampton, S., 2017. An ethnography of energy demand and working from home: Exploring the affective dimensions of social practice in the United Kingdom. Energy Res. Soc. Sci. 28, 1–10. https://doi.org/10.1016/j.erss.2017.03.012

Hampton, S., 2016. Policy in practice: can policy programmes learn from practice theory?, in: 4th European Conference on Behaviour and Energy Efficiency. Presented at the BEHAVE, University of Coimbra, Portugal.

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Hargreaves, T., 2011. Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. J. Consum. Cult. 11, 79–99. https://doi.org/10.1177/1469540510390500

Heseltine, M., 2012. No stone unturned: in pursuit of growth. Department for Business, Innovation and Skills.

IEA, 2015. Accelerating Energy Efficiency in Small and Medium-sized Enterprises, Policy Pathway. International Energy Agency, Paris.

Janda, K., Killip, G., Fawcett, T., 2014. Reducing Carbon from the "Middle-Out": The Role of Builders in Domestic Refurbishment. Buildings 4, 911–936. https://doi.org/10.3390/buildings4040911

Janda, K.B., Bottrill, C., Layberry, R., 2014. Learning from the "data poor": Energy management in understudied organizations. J. Prop. Invest. Finance 32, 424–442.

Janda, K.B., Bright, S., Patrick, J., Wilkinson, S., Dixon, T.J., 2016. The evolution of green leases: towards inter-organizational environmental governance. Build. Res. Inf. 44, 660–674.

Janda, K.B., Topouzi, M., 2015. Telling tales: using stories to remake energy policy. Build. Res. Inf. 43, 516–533. https://doi.org/10.1080/09613218.2015.1020217

Killip, G., 2013. Products, practices and processes: exploring the innovation potential for low-carbon housing refurbishment among small and medium-sized enterprises (SMEs) in the UK construction industry. Energy Policy 62, 522–530. https://doi.org/10.1016/j.enpol.2013.06.024

Lawrence, S.R., Collins, E., Pavlovich, K., Arunachalam, M., 2006. Sustainability practices of SMEs: the case of NZ. Bus. Strategy Environ. 15, 242–257. https://doi.org/10.1002/bse.533

Lomax, S., Parry, E., 2015. Micro and Small Business Engagement in Energy Markets. BMG Research / Ofgem.

Mallaburn, P., 2016. A new approach to non-domestic energy efficiency policy.

Marsden, G., Ferreira, A., Bache, I., Flinders, M., Bartle, I., 2014. Muddling through with climate change targets: a multi-level governance perspective on the transport sector. Clim. Policy 14, 617–636. https://doi.org/10.1080/14693062.2014.905823

MHCLG, BEIS, 2018. European Regional Development Fund and European Social Fund list of beneficiaries.

Mole, K., North, D., Baldock, R., 2017. Which SMEs seek external support? Business characteristics, management behaviour and external influences in a contingency approach. Environ. Plan. C Polit. Space 35, 476–499. https://doi.org/10.1177/0263774X16665362

Mourik, R., Rotmann, S., 2013. Analysis of case studies IEA DSM Task 24: Closing the Loop – Behaviour Change in DSM: From Theory to Practice (Deliverable 2 for IEA Implementing Agreement DSM Task 24 No. Task 24-Phase I Subtask 1). IEA.

NCBS, 2006. Encouraging Sustainability Amongst Small Businesses (No. 9), Behaviour Change: A Series of Practical Guides for Policy-Makers and Practitioners. National Centre for Business & Sustainability.

North, P., Nurse, A., 2014. 'War Stories': Morality, curiosity, enthusiasm and commitment as facilitators of SME owners' engagement in low carbon transitions. Geoforum 52, 32–41. https://doi.org/10.1016/j.geoforum.2013.12.007

O'Keeffe, J.M., Gilmour, D., Simpson, E., 2016. A network approach to overcoming barriers to market engagement for SMEs in energy efficiency initiatives such as the Green Deal. Energy Policy 97, 582–590. https://doi.org/10.1016/j.enpol.2016.08.006

Open University, 2013. Quarterly survey of small business in Great Britain. Special Topic: business advice and information (No. Vol 29(3)). Open University.

Owen, A., Mitchell, G., Gouldson, A., 2014. Unseen influence—The role of low carbon retrofit advisers and installers in the adoption and use of domestic energy technology. Energy Policy 73, 169–179.

Parag, Y., Janda, K.B., 2014. More than filler: Middle actors and socio-technical change in the energy system from the "middle-out." Energy Res. Soc. Sci. 3, 102–112. https://doi.org/10.1016/j.erss.2014.07.011

Parker, C.M., Redmond, J., Simpson, M., 2009. A Review of Interventions to Encourage SMEs to Make Environmental Improvements. Environ. Plan. C Gov. Policy 27, 279–301. https://doi.org/10.1068/c0859b

Powells, G., Bell, S., Judson, E., Lyon, S., Wardle, R., Capova, K., Bulkeley, H., 2015. Fostering active network management through SMEs' practises. Energy Effic. 1–14. https://doi.org/10.1007/s12053-015-9382-y

Revell, A., Blackburn, R., 2007. The business case for sustainability? An examination of small firms in the UK's construction and restaurant sectors. Bus. Strategy Environ. 16, 404–420. https://doi.org/10.1002/bse.499

Revell, A., Blackburn, R., 2004. SMEs and their response to environmental issues in the UK. Kingston Business School, Kingston University.

Revell, A., Stokes, D., Chen, H., 2010. Small businesses and the environment: turning over a new leaf? Bus. Strategy Environ. 19, 273–288. https://doi.org/10.1002/bse.628

Robson, P.J.A., Bennett, R.J., 2010. Paying fees for government business advice: an assessment of Business Link experience. Appl. Econ. 42, 37–48. https://doi.org/10.1080/00036840701579184

Schaefer, A., Williams, S., Blundel, R., 2018. Individual Values and SME Environmental Engagement. Bus. Soc. 0007650317750134. https://doi.org/10.1177/0007650317750134

Schwartz, S., 2012. An Overview of the Schwartz Theory of Basic Values. Online Read. Psychol. Cult. 2. https://doi.org/10.9707/2307-0919.1116

Shove, E., Walker, G., 2014. What is energy For? Social practice and energy demand. Theory Cult. Soc. 31, 41–58. https://doi.org/10.1177/0263276414536746

Simpson, M., Taylor, N., Barker, K., 2004. Environmental responsibility in SMEs: does it deliver competitive advantage? Bus. Strategy Environ. 13, 156–171. https://doi.org/10.1002/bse.398

Sivaev, D., 2013. How should we help business grow? Delivering business support. Local Econ. 28, 906–910. https://doi.org/10.1177/0269094213500898

Spence, L.J., 2007. CSR and small business in a European policy context: the five "C" s of CSR and small business research agenda 2007. Bus. Soc. Rev. 112, 533–552.

Turnheim, B., Kivimaa, P., Berkhout, F. (Eds.), 2018. Innovating Climate Governance: Moving Beyond Experiments. Cambridge University Press, Cambridge.

van Kleef, J.A.G., Roome, N.J., 2007. Developing capabilities and competence for sustainable business management as innovation: a research agenda. J. Clean. Prod. 15, 38–51. https://doi.org/10.1016/j.jclepro.2005.06.002

Wade, C., 2016. Exploring the role of professional installers in shaping domestic space heating practices, in: What Energy Is for: The Making and Dynamics of Demand. Presented at the DEMAND, Lancaster University.

Williams, S., Schaefer, A., 2013. Small and Medium-Sized Enterprises and Sustainability: Managers' Values and Engagement with Environmental and Climate Change Issues: SMEs and Sustainability - Managers' Values and

Engagement. Bus. Strategy Environ. 22, 173–186. https://doi.org/10.1002/bse.1740

Williamson, D., Lynch-Wood, G., Ramsay, J., 2006. Drivers of Environmental Behaviour in Manufacturing SMEs and the Implications for CSR. J. Bus. Ethics 67, 317–330. https://doi.org/10.1007/s10551-006-9187-1

Wilson, C.D.H., Williams, I.D., Kemp, S., 2012. An Evaluation of the Impact and Effectiveness of Environmental Legislation in Small and Medium-Sized Enterprises: Experiences from the UK: Evaluation of Impact + Effectiveness of Environ Legislation in SMEs. Bus. Strategy Environ. 21, 141–156. https://doi.org/10.1002/bse.720

World Resources Institute, 2015. GHG Protocol: Scope 2 Guidance. An amendment to the GHG Protocol Corporate Standard.

7. PAPER 4: POLICY IMPLEMENTATION AS PRACTICE? USING SOCIAL PRACTICE THEORY TO ANALYSE A UK SME TRANSPORT-RELATED BEHAVIOUR CHANGE INITIATIVE

7.1 ABSTRACT

Following the 'practice turn' in energy research, increasing attention is being paid to the practices of policy making. However, energy policy implementation remains under-researched. Using auto-ethnographic and extensive interview data, this paper provides a narrative account of 'Sustainable Routes': a project offering grants and advice to small business in the UK to reduce their transport-related emissions. The project exemplifies the model of Multi-Level Governance (MLG), implemented by a coalition of actors, across multiple scales.

Research data is analysed using practice theory. Building on recent debates over researching large-scale phenomena, the notion of connected situationalism is used to analyse policy implementation as a bundle of practices. 'Zooming in' on periods of disruption following project audits, findings trace how tension and conflict arose in the relationships between actors, played out through the changing constellation of meanings, materials and competences. They highlight for example, how the reinterpretation of policy documentation led material elements such as bicycles to become associated with meanings

of risk and liability, requiring a new set of competences on behalf of the carriers of practice.

This empirical account demonstrates the value of practice theory for analysing multi-actor, multi-scalar research data, and indicates potential for future research on policy implementation.

Keywords: Practice theory; multi-level governance; policy implementation; SMEs.

7.2 INTRODUCTION

Small and medium sized enterprises (SMEs) account for more than 13% of global energy demand, but are diverse in size, sector, location and in their environmental impact (IEA, 2015). As a result, developing energy and low carbon policy is a significant challenge. Facing strong resistance to 'hard levers' such as tax and regulation, the preferred approach in the EU to reducing emissions from SMEs is through incentives such as grants, loans and behaviour change projects (Hampton and Fawcett, 2017). Despite their significance, few studies have examined how these incentives are implemented (IEA, 2015; Staddon et al., 2016). This paper addresses this gap by developing an in-depth account of a European Union (EU) funded behaviour change project.

Sustainable Routes was a project running from 2009-2015, funded by the European Regional Development Fund (ERDF), supporting SMEs in south-east England to reduce their transport related emissions by adopting new travel behaviours. The project was delivered by a range of institutional actors, including the European Commission, a UK central government department, a non-profit organisation, partners, evaluators and auditors. This project is typical of EU regional development policy, where responsibility for

implementation is shared amongst a coalition of actors operating at multiple-levels (Marks, 1993).

The implementation of projects designed using this model of multi-level governance (MLG) is characterised by complexity (Hooghe and Marks, 2003). Project implementation involves a variety of organisations and individuals, each carrying different responsibilities and pressures and responding to internal institutional demands, and the activities of others. Beyond the individuals carrying responsibility for implementation there are broader political and economic circumstances, bureaucratic rules and changing expectations for transparency, which must be interpreted and navigated (Brown et al., 2015; O'Neill, 2002). In addition, project implementation relies on material elements including policy documentation and guidance, technology and the physical objects associated with travel behaviour change such as bicycles (Affolderbach and Schulz, 2016).

Given this complex assemblage, telling the story of the implementation of Sustainable Routes requires some analytical assistance. Practice theory, with emphasis on distributed agency (Whittle et al., 2015) and a flat ontological worldview (Pickering, 1995), offers a suitable framework for interpreting and representing the coming together of these human and non-human elements. It highlights the interdependent relationships between actors at different levels of governance, individually and collectively making sense of changing political and institutional environments (Brown et al., 2015). Although practice theory has been used extensively within social scientific energy research (Ellsworth-Krebs et al., 2015; and a selection from this journal Galvin and Sunikka-Blank, 2016; Hampton, 2017; Madsen and Gram-Hanssen, 2017; Shove et al., 2012; see Shove and Walker, 2014), there have been calls for greater engagement with energy policy discourse (Keller et al.,

2016; Maréchal and Holzemer, 2015; Sahakian and Wilhite, 2014; Sovacool, 2014). However, there is ongoing debate over how a practice perspective can be used to conduct research on large-scale phenomena (Nicolini, 2016; Watson, 2016). Engaging with these live issues, this paper considers policy implementation as a bundle of practices (Shove and Walker, 2014), and applies analytical tools developed in practice theory to unearth a range of valuable insights.

The next section introduces the multi-level governance framework in the context of EU policy. It summarises social scientific energy research using practice theory, and reviews the limited attempts to apply this theory in a policy context. The third section describes the Sustainable Routes case study, and the fourth introduces the theoretical approach adopted by this paper. Section five outlines the methodological approach used for this research. Section six presents a narrative account, exploring how meanings, materials and competences changed over the course of the project's implementation (Shove et al., 2012). Having identified the importance of discretion within implementation practice, section seven discusses its ontological status and policy implications. The final section reflects on the implications of considering policy implementation as a practice.

7.3 LITERATURE REVIEW

7.3.1 MULTI-LEVEL GOVERNANCE

Multi-level governance is an approach that has been used in political science since the 1990s to describe contemporary forms of governance, with emphasis on the structures of the EU (Hooghe, 1996; Hooghe and Marks, 2003). It has also been influential in studies of natural resource management (Brondizio et al., 2009; Ostrom, 2015), and the role

played by cities and regions in responding to climate change (Bulkeley and Betsill, 2005; Marsden et al., 2014). This paper builds primarily on literature in the latter category.

MLG differentiates between different 'styles' of governance, including conventional 'Type I' actors such as institutions of government whose jurisdictions are defined by geographical area or broad policy remits and where clear hierarchies exist between organisations. 'Type II' actors on the other hand operate in flexible coalitions, often focused on specific tasks or policies and acting with overlapping jurisdictions. This distinction has been used to describe ways in which governance is changing, particularly with reference to cities, the state and supranational bodies (Bulkeley and Betsill, 2005; Gustavsson et al., 2009).

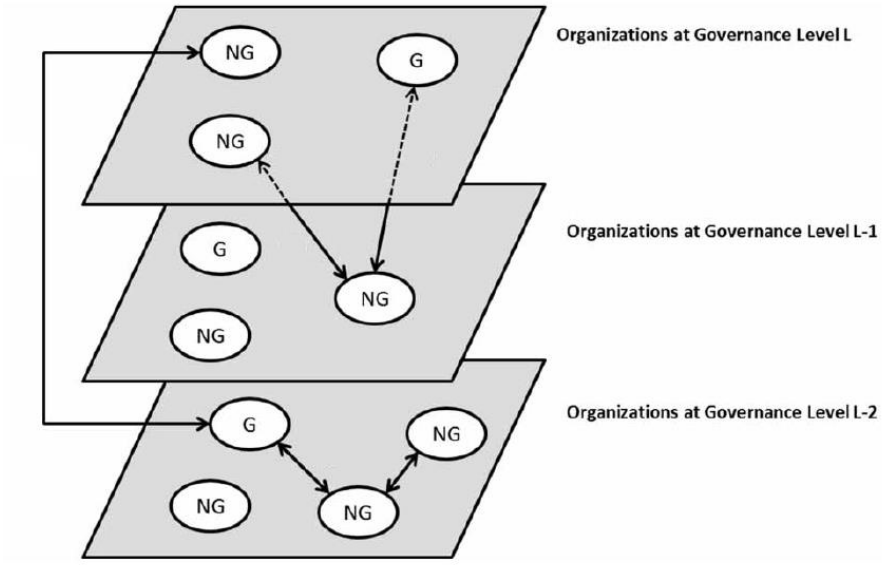


Figure 7-1 - Marsden et al's representation of multi-level governance

Marsden et al. (2014) focus on four UK case studies of transport policy to describe a form of governance which is fragmented, incremental, and involves multiple actors beyond the conventional institutions of government (Revell and Rutherfoord, 2003). Figure 7-1 is the

authors' representation of the different 'tiers' of governance typical of a multi-level project (Hooghe and Marks, 2003), ranging from the local (Level L-2) to the supranational (Level L). Bidirectional arrows depict the relationships which emerge between governmental, 'Type I' institutions (G) and non-governmental, Type II actors (NG). While the levels indicate the different scalar reach and remit of actors, the authors point out that these relationships are often non-hierarchical when it comes to sharing responsibility for policy implementation (Marsden et al., 2014).

European SME policy exemplifies the model of multi-level governance, with Type I and Type II actors working in partnership. At the supranational level, the European Commission (EC) administers the European Structural and Investment Funds, which comprise a significant proportion of funding for SME energy policy across the EU. Worth roughly €1.8bn/year in the UK, these funds are overseen by the Department for Communities and Local Government (DCLG) at the national scale. Non-profit organisations design energy related projects and bid for allocations of funding at the regional level (Eadson, 2014). Commissioned projects such as Sustainable Routes then draw together multiple organisations with varying remits, including Chambers of Commerce, Municipalities, and micro networks of SMEs. Working together across these scales, these actors form task-oriented coalitions, sharing responsibility for implementing SME energy policy.

7.3.2 PRACTICE THEORY AND POLICY

Practice theory has become influential in social scientific research into energy demand. Proponents of the framework aim to develop analyses of energy consumption which move the unit of analysis away from the individual and their motivations, instead highlighting the ways in which energy is bound up in the broader 'doings and sayings' of everyday

social life (Gram-Hanssen, 2010; Shove, 2010; Shove et al., 2012; Warde, 2005). This framework has been employed to produce accounts of the lives of practices, including showering (Hand et al., 2005), or achieving comfort in the domestic setting (Shove, 2003; Strengers and Maller, 2011). While its analytical strengths are well established, there have been calls for more 'practicable' applications of practice theory, to engage with the processes and practices of policy making, with a view to potentially influencing the role of government to better 'steer' practices (Keller et al., 2016; Reardon and Marsden, 2016; Sahakian and Wilhite, 2014; Shove, 2016; Spurling and McMeekin, 2015; Watson, 2012). However, such calls tend to focus on higher levels of policy discourse as opposed to the practice of implementing existing energy policy (Marsden et al., 2014; Reardon and Marsden, 2016; Spurling and McMeekin, 2015). This paper focuses on the latter of the two categories described by one policy advisor interviewed for this study: 'one is fluffy, one is the real world'.

Recent work exploring the linkages and barriers between practice theory and policy include Shove's (2014) fictionalised conversation between a policy-maker and a social scientist adopting practice theory. For Shove, efforts to mould 'practice theory into some policy-amenable form' are fruitless because of the paradigmatic differences between practice perspectives and the models of behaviour change adopted by energy policy-makers. Others however, have drawn on practice theory to offer insights into policy practices themselves. Watson for example, has argued for an appreciation of the limitations of policy-makers' capacity to influence embedded systems of practice, emphasising the need to engage with the political dimensions of policy (Watson, 2016, 2012). This is far from easy however, and there is debate within contemporary practice theory about how best to conduct research on large-scale phenomena, including

institutions and public policy (Nicolini, 2016). This is further discussed in section four, which also explains why practice theory offers a suitable framework for conceptualising multi-scalar implementation.

Despite Shove's reluctance to adapt practice theory for the sake of policy audiences, the 'three-element model' of practice theory (Shove et al., 2012; Shove and Pantzar, 2005) has proven to be a popular heuristic for a number of authors aiming to effect change in policy discourse and practice. Kuijer's 'bubble model' (2014; Figure 7-2) develops this diagrammatic approach, depicting connections between types of elements, and illustrating that some may be more significant than others in individual performances of practice. Recognising the comparatively greater influence of the numerical sciences for policy, Higginson et al. (2015) follow Kuijer's vision in employing the model as a framework for quantifying practices. Their network maps of laundry illustrate how different elements are recruited to performances of practice, showing for example how the tumble-dryer competes with the washing line or clothes horse. These diagrams show how each performance involves a different configuration of the practice-assemblage, helping to trace how practices change over time as new technologies or social norms come to the fore.

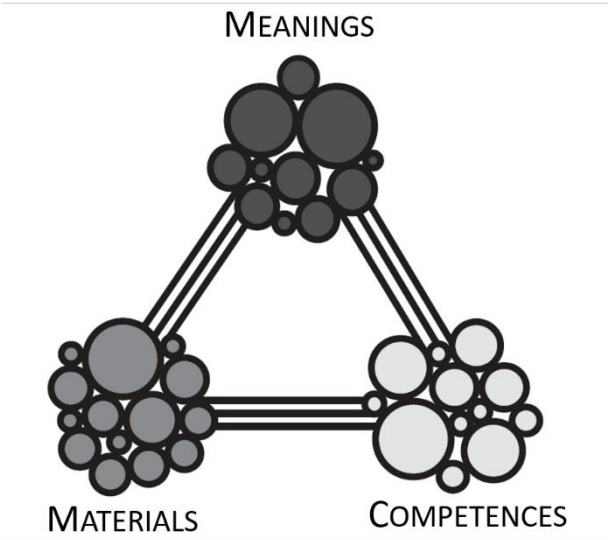


Figure 7-2 – Kuijer's development of the three-element model. Each 'bubble' represents an element of practice, the size showing the relative significance of each.

One strength of the three-element model is that it gives prominence to elements of practice with different ontological status. It highlights the meanings and cultures associated with practices, as well as giving voice to non-human, material elements (Shove and Pantzar, 2005). An attention to competences accommodates different forms of intellectual and embodied knowledge, recognising the central role played by the 'carrier' of practices, without reinstating the individual as the principal unit (Shove and Pantzar, 2007, 2005).

This brief review of two literatures highlights the different epistemic traditions of multi-level governance and practice theory. While both offer useful insights for understanding the nature of policy implementation, using them in combination is not straightforward. The theoretical approach adopted in this paper is discussed in section four, but first some background on the empirical case study is provided.

7.4 CASE STUDY

Empirical data for this paper is drawn from a behaviour change project aimed at reducing transport emissions from SMEs. Funded by the ERDF, Sustainable Routes awarded small match-funded grants (≤£1000) to over 700 SMEs based in the south east of England, assisting with the purchase of bicycles, secure bike shelters, showers, mobile computing technology and teleconferencing equipment.

The strategic priorities for the ERDF 2007-2013 funds were set in England by the nine Regional Development Agencies. The South East Operational Programme was produced in 2007 by the South East England Development Agency, with a central aim to 'promote competitiveness in South East England whilst contributing to reducing the region's ecological footprint' (SEEDA, 2007). The Regional Development Agencies were primarily strategic and administrative bodies, and did not directly deliver projects. Instead, Local

Authorities and non-profit organisations bid for funds by proposing projects which would target SMEs to stimulate job creation and promote 'sustainable production and consumption'.

The Sustainable Routes proposal for funding cited the 'Smarter Choices' report (Cairns et al., 2004) which called for greater use of 'soft interventions' in sustainable transport policy, such as travel plans, car sharing, home-working and teleconferencing. While Local Authority transport teams in the south east had had some success in working with larger institutions such as schools and hospitals, they had struggled to promote this service to SMEs. Sustainable Routes partnered with a number of Local Authorities and the National Business Travel Network, creating a 'demand led' system for travel planning. Prior to applying for grants, SMEs entered business travel data into an online form and an algorithm produced tailored 'Travel Efficiency Plans', with recommendations for investment.

A non-profit organisation based in Buckinghamshire designed and administered the project from 2009 to 2015, working with DCLG Contract Managers, external evaluators and auditors, local authority partners, and recruiting participant SMEs. Written into the proposal for funding, the project had a number of contractual targets including saving 4,600 tonnes of CO_2, developing 2,400 sustainable mobility business strategies and delivering a net increase of £8.5m in Gross Value Added. This paper later discusses how the measurement of these targets became contested. However, on an official basis Sustainable Routes met each target, and was considered an exemplary project by all stakeholders (QandA Research, 2015).

Adapted from Marsden et al's representation of multi-level governance, Figure 7-3 depicts the coalition of actors involved in Sustainable Routes and their complex relationships. The diagram is a simplified representation of the different levels of governance, with national and supranational scale institutions – typically Type I - at Level A, and project focused, Type II actors at level B. SME beneficiaries and promotional partners (such as suppliers of energy efficient products) are represented at Level C. In practice, the different scopes and remits covered by institutions overlap and intersect in complex ways, and the bi-directional arrows indicate that relationships between actors are often non-hierarchical. However, for the purposes of depicting the *overall design* of Sustainable Routes' governance, the three levels used by Marsden et al provide a suitable, if normative, representation.

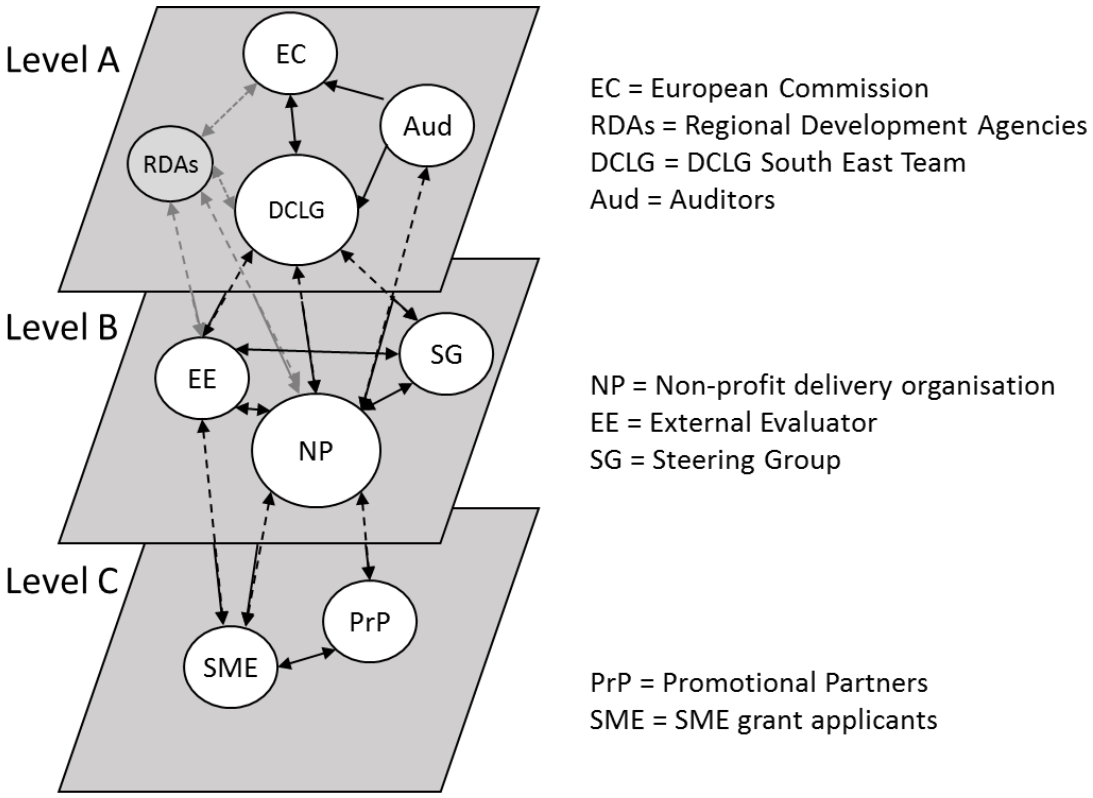


Figure 7-3 - The multi-level governance of Sustainable Routes (adapted from Marsden et al 2014). The RDAs are displayed in grey because they were disbanded mid-way through the project. The dotted lines illustrate where connections run between levels.

7.5 THEORETICAL APPROACH

Sustainable Routes provides an example of multi-level governance in practice. However, while MLG provides a useful overview of governance design (see Figure 7-3), it is insufficient as a theoretical framework for understanding the experiences and everyday realities of implementation. It helps to describe the complex network of relationships between types of actors at different governance levels, but its focus is on institutions as boundaried units. Relationships are represented as existing between organisational units, without delving into the lived experiences of the individuals working within, nor acknowledging the role played by non-human elements.

Practice theory offers an alternative framework for understanding policy implementation within this network of relations. Although it has not been applied in studies of energy policy implementation, it is well suited for this purpose for three reasons. Firstly, a characteristic of practice theory is that it conceives of social activity without foregrounding the individual (Reckwitz, 2002). Instead, practices are conceived of as entities themselves, 'carried' by individuals, and continually reproduced and sustained through performance (Schatzki, 2001). There are parallels with multi-level governance, where no single individual nor organisation is singularly responsible for implementation (Affolderbach and Schulz, 2016). Those carrying responsibility for implementation continually configure and shape this bundle of practices through everyday performances of work, and through their inter-personal and inter-institutional relationships.

Second, practice theory offers a perspective on social activity which acknowledges the role of elements of different ontological types. Its 'flat ontology' gives prominence to materials, and the different forms of knowledge and competences that make up practices

(Pickering, 1995; Shove and Pantzar, 2005). Applied to multi-level policy implementation, this highlights the role played by bureaucratic documentation, interpersonal skills and concepts such as risk. By foregrounding these socio-material elements, the hybrid, 'more-than-human' nature of implementation practice emerges (Whatmore, 2006).

Thirdly, practice theory places emphasis on the *mutable* nature of practices. The three-element model, for example, conceptualises practices as relational 'constellations' of elements (Reckwitz, 2002; Shove and Pantzar, 2005); while Shove and Walker highlight the 'ongoing reproduction' of interrelated bundles of practice, through which societal expectations of energy services are defined (Shove and Walker, 2014). Given continual change in political discourse, economic circumstances and policy objectives, even the most normative accounts of policy implementation acknowledge its dynamism (Matland, 1995). Practice theory proffers an account of implementation as *emerging* from the dynamic relationships between elements. As such, it resists taken-for-granted definitions of institutional boundaries, and challenges reified levels of governance.

This last point highlights some of the conceptual tension arising from efforts to use both MLG and practice theory. This is particularly apparent in their respective treatment of scale and institutions. Emerging from the disciplinary tradition of political science, it challenges conventional notions of institutional power, hierarchy and the role of the state, and provides a more nuanced perspective on institutional dynamics, the emergence of new types of governance actors and the role of scale. Conversely, practice theory begins with a more radical approach to power and relationships. It flattens scale and questions boundaries, focusing instead on how power emerges through the integration of ontologically equivalent elements in individual performances (Watson, 2016). This bottom-

up approach can however lead to difficulties when researching large-scale phenomena, including policy implementation (Nicolini, 2016; Watson, 2016).

Nicolini (2016) discusses these issues with reference to different schools of thought within practice theory. He identifies the view of those adopting a truly flat ontological account of practices, for whom 'so-called 'large-scale phenomena' are constituted by and emerge through the aggregation of interrelated practices and their regimes of reproduction'. He points out this approach inevitably leads researchers to deconstruct social activity into its smallest constituent parts. This leads to a form of 'micro' sociology which deals inadequately with larger-scale social activity including the activities of institutions. When applied to policy implementation, researchers adopting this approach may be more inclined to focus on smaller-scale practices such as auditing, project promotion, adherence to rules or evidence keeping. While each of these contribute towards implementation, such empirical research would struggle to identify aspects of implementation which are greater than the sum of its parts.

Nicolini points out however, that the school of practice theory which promotes a flat ontology is far from ubiquitous, and other scholars, including Bourdieu and Giddens, contend that 'structure, power and fields exist in their own right' and constitute a different 'level' of social activity (2016, p. 100). Within this tradition, there is scope for differentiating between the ontological status of research subjects, allowing the 'impatient' researcher to reinstate objects such as the state without demonstrating its rhizomatic emergence from the field of practices.

This paper adopts the approach of Nicolini's third and preferred category, which he names 'connected situationalism' (Nicolini, 2016). Retaining the philosophical integrity of

a flat ontology, this enables researchers to investigate and comment on large-scale phenomena. Rather than direct attention to activity carried out in a single scene of time and space, connected situationalism pays attention to connected 'chains' of performances in multiple settings. From this perspective, multi-sited practices are constituted by a combination of performances *and* the relationships between them. In one move, this device incorporates the broader context in which performances take place, and lays the ground for 'zooming in' on the performances which constitute large-scale phenomena (see earlier work Nicolini, 2009). In Nicolini's words: 'performances therefore can be understood only if we take into account the nexus in which they come into being' (Nicolini, 2016). Connected situationalism resists the temptation to reify levels of governance and institutional boundaries, but explores the ways in which their scope, power and influence emerge from multiple performances and their interwoven socio-material elements. It is therefore sympathetic to case-study based research, in which the global is simultaneously reflected in, and constructed by, the local. As Nicolini writes elsewhere (Nicolini, 2009), *zooming in* involves a re-positioning of the theoretical lens 'so that certain aspects of a practice are fore-grounded and others are temporarily sent to the background'. This close analysis then enables the researcher to *zoom back out* to reflect on the 'translocal effects' that situated performances have on wider practice assemblages.

The question of how to conduct empirical research on large-scale phenomena is a live debate within practice theory (Sahakian and Wilhite, 2014), and no consensus has been reached regarding the optimal analytical approach. Acknowledging that policy implementation accommodates a variety of smaller practices such as those described above, this paper therefore uses the notion of 'bundles' as adopted by Shove and colleagues (Shove et al., 2012; Shove and Walker, 2014), to provide an account of a

large-scale set of interconnected activities. Given the inherent complexity involved in researching interrelated, multi-sited practices, there have been few examples of empirical studies of practice-bundles, and fewer still investigating the web of complex, relational activity involved in implementing multi-level policy. In an exploratory move, this paper appropriates the analytical tools developed to analyse individual practices, showing that the three-element model, and the notion of connected situationalism provide fruitful analytical assistance.

In support of its theoretical approach, this paper builds on the respective traditions within both MLG and practice theory of using diagrams to depict (1) a complex web of actors, and (2) constellations of practice elements. Within practice theory, the three-element model provides a useful categorization of element types, but does little to portray the carrier of practice. By implication, we can assume that the three-element model considers each practice-performance to be carried out by a single carrier. This is problematic when portraying large-scale practices which involve multiple practitioners.

Developing the multi-level representation of Sustainable Routes in Figure 7-3, Figure 7-4 retains the three governance levels, as a simplified and normative depiction of the scope of the different institutional actors involved in the project. Integrating the three-element model of practice theory into this representation, it suggests that the elements of shared practice provide the scaffolding upon which bidirectional relationships between governance actors are built. This simple model helps to illustrate the notion of connected situationalism, and provides the basis for analysing multi-actor implementation practice.

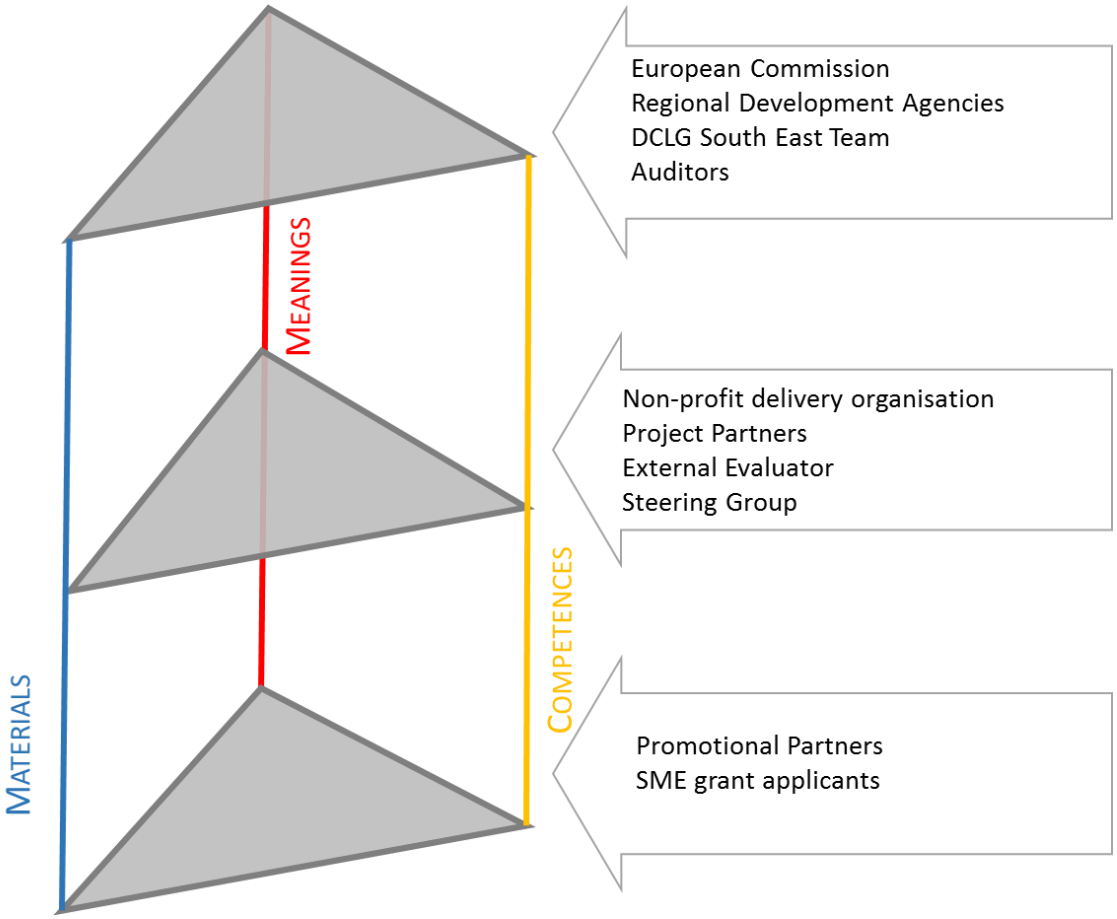


Figure 7-4 - Combining Multi-Level Governance with the three-element model of practice theory to depict the shared practice of implementation

7.6 METHODS

The methods for this case study research are drawn from the principles of 'analytic auto-ethnography' (Anderson, 2006). I became Sustainable Routes Project Manager in 2013, with responsibility for delivering targets, balancing finances and liaising with project stakeholders. I was employed by the non-profit delivery organisation before becoming a full-time researcher in October 2015. This direct involvement provided in-depth knowledge of the processes, pressures and deliverables associated with the project, later drawn on when Sustainable Routes was chosen as a focus for empirical study.

Anderson (Anderson, 2006) argues that postmodern discourse on research methodology has led to a preference within social science for 'evocative auto-ethnography', whereby researchers, all too aware of their own positionality, avoid making realist or analytic observations. Anderson aims to revive the analytic approach by setting out five guiding features for researchers. (1) Defending the conventions of ethnography, he suggests that as 'complete members' of the institution under study, researchers' gain privileged access to data. (2) Researchers must analytically reflect on their position; (3) present data in a way which does not obscure the researcher's self in the analysis; and (4) support their evidence through dialogue with informants beyond the self. (5) Finally, a desire to do more than present internally directed observations, but to comment on broader social phenomena 'from the inside' distinguishes the analytic approach. Table 7-1 describes how these features are adopted in this paper.

Table 7-1 - Applying Anderson's five features of analytic auto-ethnography

1) Complete member status	As former Project Manager, I had access to a variety of data which were compiled and analysed for this paper. These included project documentation, official ERDF implementation guidance, email records, audits and evaluation reports, parliamentary transcripts and government archives. As a 'complete member', I built personal and professional relationships with each of the stakeholders involved in the practice of policy implementation. They were emotionally and professionally invested in the project. In theoretical terms, they were one of the active 'carriers' of the practice of implementation. Given the complexity, depth and timescale of Sustainable Routes, vast quantities of data were produced and analysed as part of this research. Having complete member status is the only viable means of conducting research on implementation at this scale.
2) Analytic reflexivity	Soon after starting as project manager for Sustainable Routes it became apparent that my priorities differed subtly from other stakeholders. With an educational background in social science and a passion for the environment, I was primarily motivated by business behaviour change and

	emissions reduction. Other project stakeholders were comparatively unfamiliar with environmental accounting methodologies, specialising in compliance and supporting businesses to grow.
3) Narrative visibility of the researcher's self	Whilst working on Sustainable Routes I maintained a personal journal which included reflections on the experiences of implementing the project. Although it had not been written as a research diary, extracts are included in the subsequent findings.
4) Dialogue with informants beyond the self	All of the individuals with significant involvement in Sustainable Routes were recruited and consented as participants for this study. Empirical data are drawn from semi-structured interviews with ex-colleagues, the project evaluator, and senior figures within the DCLG European funds team. Interviews were conducted 6-12 months following the closure of Sustainable Routes, so were also an opportunity to reconnect with ex-colleagues and collaborators. As such, discussions were informal. Some interviewees had since moved on to new roles outside low carbon SME support, whereas others were in the process of bidding for new project funding and re-writing documentation for new projects. Interviews lasted between 40 and 70 minutes, were digitally recorded and transcribed verbatim, but quotations are kept anonymous. The diagrams used to present findings were developed in collaboration with interviewees and are used to depict the practice of policy implementation. Although the portrayal of implementation practice and its constituent elements were discussed with participants, the depiction of the meanings, materials and competences are inevitably influenced by my own memories and sense-making processes (Brown et al., 2015). Diagrams should be interpreted as illustrative rather than comprehensive representations.
5) Commitment to theoretical analysis.	This paper provides insights into the practice of policy implementation in the context of UK SME policy, and contributes to efforts to research large-scale phenomena using practice theory (Hui and Schäfer, 2015; Nicolini, 2016).

7.7 FINDINGS

7.7.1 AUDITS AND DISRUPTION

Sustainable Routes ran from 2009 to 2015, during which time a number of political and administrative changes affected project implementation. In June 2010, the new coalition government in the UK announced the abolition of Regional Development Agencies as part

of the so called 'bonfire of the QUANGOs' (Guardian, 2012), and the administration of ERDF funds was 'centralised' into the hands of DCLG. This process involved consolidating policy guidance and targets from each region and creating new ERDF teams within the direct employ of DCLG. Respondents described this process as 'messy', 'painful' and 'an absolute nightmare'. The new government also implemented radical spending cuts and DCLG faced the most extensive real-terms cuts of all central government departments[7], involving staff cuts, office closures and resource constraints (Institute for Fiscal Studies, 2015).

The centralisation of ERDF administration to DCLG alongside its reduced resources marked a shift in the performances involved in implementing Sustainable Routes. Previously, when making decisions about the eligibility of a particular SME for a grant, an individual purchase or the acceptability of financial evidence, DCLG staff and project delivery teams had negotiated with the project team 'on a case by case basis' *(DCLG employee),* making reference to, but not completely deferring to, official guidance. From 2011 to 2013, a series of audits were conducted, focusing on DCLG's role as the managing authority for European Regional Development Funds. The European Commission (EC) and the Government Internal Audit Agency each identified a number of issues, known in European policy jargon as 'irregularities':

> 'They came in and ripped us apart, how we did the transition from the Regional Development Agency [to DCLG]…oh they ripped us apart on every single bit…' (*DCLG employee*).

[7] 51% between 2010-11 and 2015-16 (Institute for Fiscal Studies, 2015)

Critical audit findings forced DCLG to tighten its procedures, particularly regarding financial record keeping. Previously DCLG had used its discretion regarding what constituted financial evidence, accepting invoices and receipts as documentation of project expenditure. However, the audits stipulated that these forms of evidence were insufficient, and that bank statements, 'wet ink signatures' and declarations that documents were 'true copies of original documents' would now be required as evidence of payment. Not only did this lead to increased paperwork and lengthier financial claims processes for all actors involved in the implementation of Sustainable Routes, but it also meant that funds allocated to the UK were 'clawed back' by the EC. Both of these outcomes were raised as items for concern in the UK parliament (CLG Committee, 2012).

Whereas the model of governance on Sustainable Routes had involved close working and collaborative decision-making, the audits introduced risk and liability. DCLG responded by becoming increasingly reluctant to make individual judgements.

> 'For the projects… if they ask, you refer them to the guidance. That way you're safe. So the project can't come back and say 'so and so said this''.

The difficulty with this shift towards a reliance on written guidance was that the standardisation process had reduced the amount of official documentation available. While a 'National ERDF Handbook' (DCLG, 2012a) had been produced as an attempt to consolidate regional guidance, at 137 pages it was less than a tenth of the length of the earlier 'User Manual' (DCLG, 2009) and lacking necessary detail.

Figure 7-5 uses the three-element model of practice theory as expanded by Kuijer (2014) to represent changes in practice undergone by the DCLG Contract Manager in response to the EC and internal audits. Charting the period from 2011 to 2014, this diagram was

co-created with DCLG staff to illustrate how the meanings, materials and competences involved in their everyday working practices changed over time. A draft version of this diagram was developed and discussed during the interview, leading to the identification of additional elements and the adjustment of the size of each 'bubble', which are used to convey their relative significance.

From a practice theory perspective, moves towards stricter adherence to official guidance may be described as reconfiguring the constellation of elements. Figure 7-5 charts this reconfiguration, showing how risk, accountability and stress came to replace 'making a difference' and 'helping local businesses' as dominant meanings in their daily working practice; and how bank statements, wet ink signatures and ineligible expenditure emerged as new materials. The need to interpret risk, negotiate changing political environments and make risk-laden interpretations of guidance documents were new competences developed as part of the practice of policy implementation.

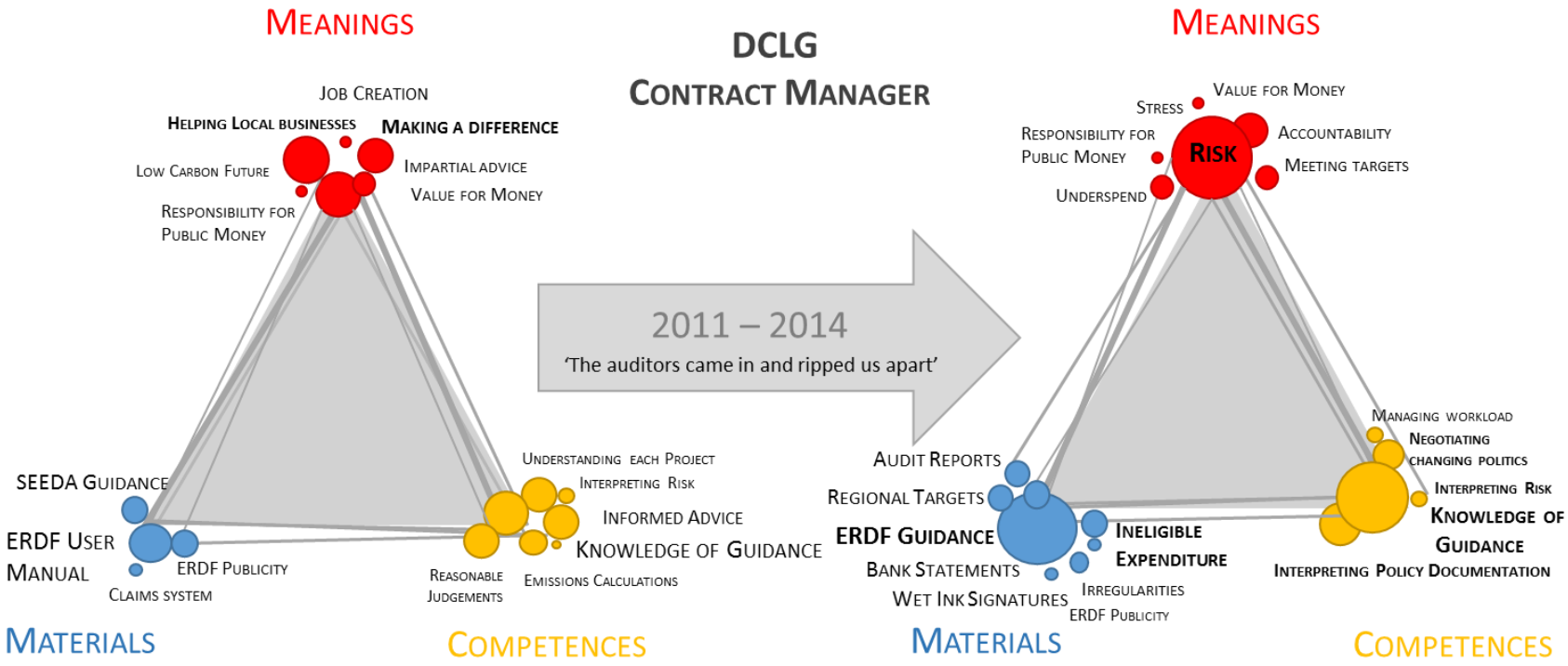


Figure 7-5 - The changing nature of policy implementation-as-practice, for the DCLG Contract Manager on Sustainable Routes. (Developed from Kuijer, 2014)

An ironic consequence resulted from the abridgement of official guidance alongside the command to DCLG Contract Managers to adhere to it. Whilst guidance documentation took on greater significance in the practice of policy implementation, it was reduced in length, requiring actors to make greater interpretative leaps. Figure 7-5 illustrates how the competences involved in making reasonable judgements, understanding each project and providing informed advice were replaced by requirements for increased knowledge of guidance, political negotiation and interpreting risk.

7.7.2 EVIDENCE, DOCUMENTATION AND THE DYNAMICS OF RISK

The EC and Internal audits led to new requirements placed on actors at all levels, reconfiguring their working practices. One major material change was the new requirement for evidence of financial defrayal for all project payments in the form of bank statements. For Sustainable Routes this covered administrative expenditure as well as match funding invested by SME grant recipients, a sample of which was requested by DCLG's Finance division in 2014. However, the project team had up to this point been accepting receipted invoices in lieu of bank statements, having agreed this with the DCLG Contract Manager at the start of the project. This request coincided with two separate internal DCLG audits, both of which continued to accept receipted invoices as evidence of match funding. In response to protests against the inconsistency of evidence requirements, the project team were referred to a single reference in the ERDF guidance that stated: 'evidence of [defrayal] *can* be required by an auditor (in the form of bank statements)' (DCLG, 2009 parentheses in original).

At the time of this disruptive revelation, the project had awarded over 400 grants to SMEs, roughly 50% of which had supplied bank statements as evidence of defrayal. In written

communications, DCLG representatives held a firm line, warning of financial 'clawback' where evidence could not be produced for the audit sample. Indeed, in a number of other cases where auditors found documentation to be missing, financial penalties had been issued. Despite extended negotiations, the project team cascaded the requests for bank statements to the grant recipients in question, leading to displeasure from SMEs where this related to payments made over two years previously.

While it was tacitly clear to all that the required documentation was missing in a number of cases that extended far beyond the sample selected for audit, auditors and DCLG staff *did not* seek to pursue cases beyond the bounds of the audit. This case is an example of the ironic consequence of the move towards greater adherence to official guidance as a means of achieving transparency and accountability: the discretion of individuals was as important as ever (Proudfoot and McCann, 2008).

As project manager, the period following these audits was the most demanding and stress-inducing while working on Sustainable Routes. When joining the project in 2013, I had anticipated investing most of my efforts in supporting SMEs with grants and advice, and using skills of persuasion and persistence to engender sustained behaviour change. Now, having to examine the projects' terms and conditions, deal with accusations of blame, request financial evidence from grant recipients and mitigate against potentially catastrophic financial penalties required a markedly different set of competences. My journal notes from this period focused on managing confrontation in a working environment, and I began reading about developing assertiveness skills (including Patterson et al., 2011).

> 'I'm fed up of confrontation and difficult people, and having to stand my ground, whilst also doing a lot to accommodate others. There is so much hostility! It's tiring, and it's bringing out a side of me which is unfamiliar and uncomfortable.' (Journal entry, 25/9/14)

While it was reassuring to see that auditors seemed to be exercising discretion by not seeking to uncover further financial irregularities, there could be no guarantee of their continued tact. As project manager, this induced a degree of anxiety which was reflected in further a journal entry:

> 'I've been really stressed at work and am feeling rubbish about going in this morning. Lots of people being difficult, and I've got a difficult phone call to make today with a project partner. And then the Steering Group meeting next week! Feeling overloaded with work.' (Journal entry, 20/4/15)

These journal entries demonstrate the how the development of these new, challenging competences were being developed *relationally*, between different stakeholders on the project. The reconfiguration of implementation-as-practice was being played out through interactions such as difficult telephone calls, confrontational meetings and awkward silences.

Figure 7-5 above showed how the elements of practice for a single actor became reconfigured as a result of the project audits. The account of bureaucratic (re)interpretations, discretion and stress builds on this to demonstrate how this reconfiguration plays out through interactions *between* carriers of practice. Figure 7-6 *zooms in* on a sub-group of actors during this period: the DCLG Contract Manager (Level A), the Project Manager (Level B), and an SME which was asked to retrieve bank statements from two financial years previous (Level C) (Nicolini, 2009). This diagram visualises how elements were shared and exchanged between the different actors Bank

statements, project terms and conditions and official guidance became significant *material* elements at all levels, whilst risk, blame and accountability became dominant *meanings*. Key *competences* now included the interpretation of legalese, assertiveness and persuasion.

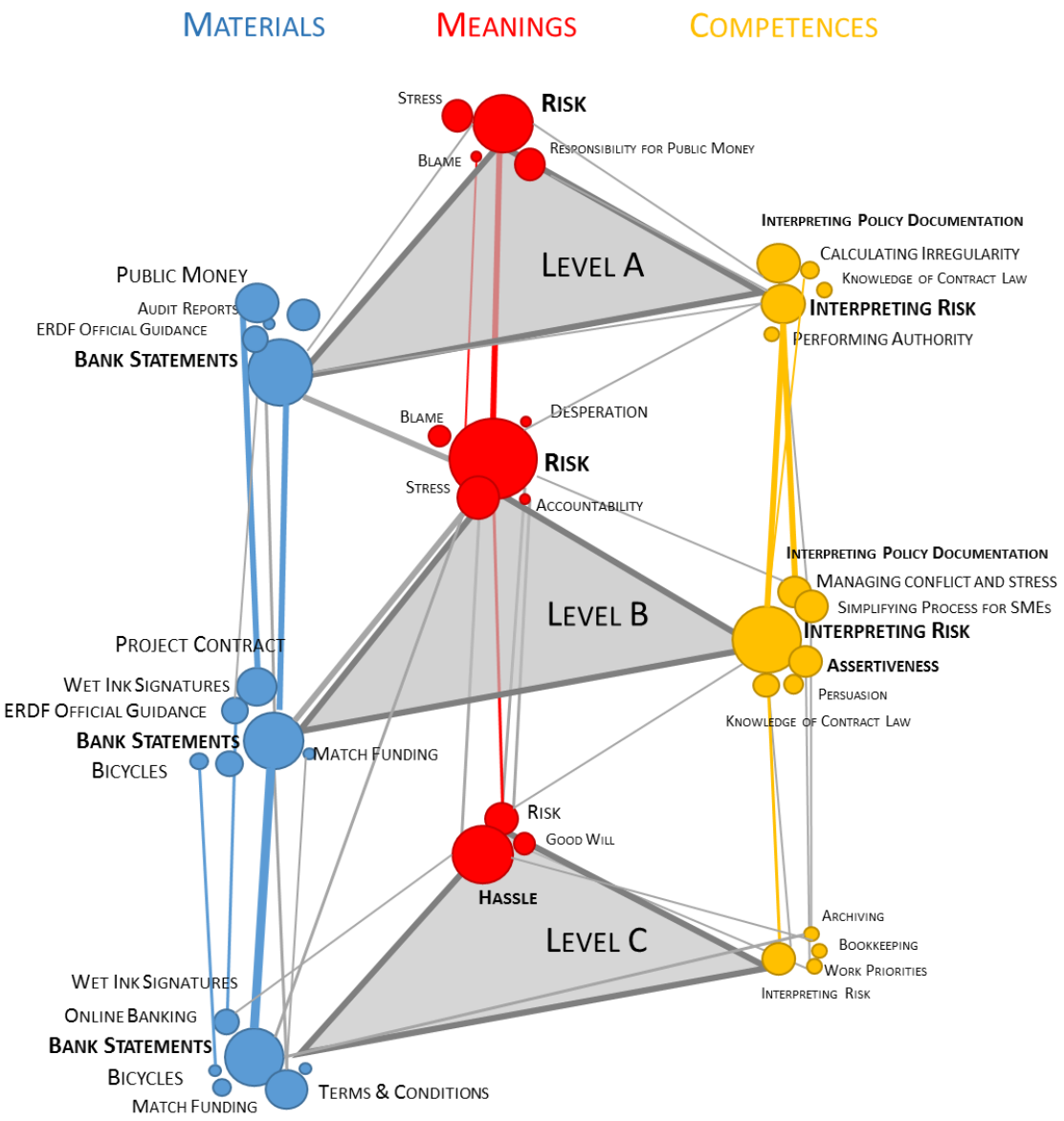


Figure 7-6 - The intersecting elements of the practice of policy implementation following project audits. Not all relevant carriers of implementation are depicted. The top level shows DCLG Contract Managers and Auditors; the middle level represents the project delivery team; and the bottom level refers to SME grant recipients who were asked to provide bank statements months after receiving support. The coloured links indicate a connection between a shared element.

Figure 7-6 helps to depict the key elements of implementation practice on Sustainable Routes following the disruptive audits. It illustrates how risk became pervasive on the project, felt most strongly by the project team at Level B, as it was their responsibility to gather bank statements and wet ink signatures, or else face fines. The diagram highlights the links between risk and these material elements, and how it related to competences such as assertiveness, managing conflict, and knowledge of contract law. The diagram is a simplification of the complex socio-material assemblage, but which conveys the interrelated activities carried by all carriers of implementation practice. It flattens the carriers of practice into artificially distinct levels, and fuses together a bundle of small-scale practices. This depiction illustrates how power and influence were played out in the *trading and sharing of elements* in this period of tension in the story of Sustainable Routes' implementation.

7.7.3 THE PARADOX OF TRACING CHANGE THROUGH FIXED OBJECTS

The discussion above showed how disruptive audits led to significant change in the implementation Sustainable Routes, tracing these changes within the relational dynamics of multiple actors and the constellation of elements. This section discusses an example where the reconfiguration of elements led to an outcome which directly *counteracted* the low-carbon objectives at the centre of Sustainable Routes. It does so by following Nicolini's notion of 'zooming in' on a particular material element (Nicolini, 2009).

From 2014-2015, a partner of Sustainable Routes was running a parallel transport behaviour change project targeted at SMEs. Aware of the increased significance of official guidance, in December 2014, they requested some help in interpreting the ERDF rules on

eligible expenditure. They raised a question with a DCLG official relating to the following passage:

> 'Mobile infrastructure such as buses, boats and other vehicles cannot be funded with ERDF because of the possibility that the asset will be removed from the Operational Programme area' (DCLG, 2012b, Section 6.6).

Although not specifically mentioned here, the official interpreted this text as applying to *bicycles,* meaning that they would be ineligible for grant funding. At this stage, Sustainable Routes had already supported dozens of SMEs to purchase bicycles for the purpose of substituting the car for shorter business trips. Suddenly, these investments became at risk of being clawed back if they were included in future audit samples, and the auditor interpreted this guidance in the same way as their colleague. Without changing in physical form, or becoming any less effective at reducing emissions, the bicycles, distributed amongst SMEs in south east England, became *roaming symbols of liability*.

Figure 7-7 represents how the material element of the bicycle became associated with different meanings and competences over the course of the project. Whereas in the project's early stages the bicycle was associated with behaviour change, reduced car dependence, and required only receipted invoices as evidence of defrayal, it later became associated with stress, risk and bank statements. This produced a paradoxical situation where the physically unchanging element became a pivot around which the constellation of elements shifted, reconfiguring the practice of implementation as a whole.

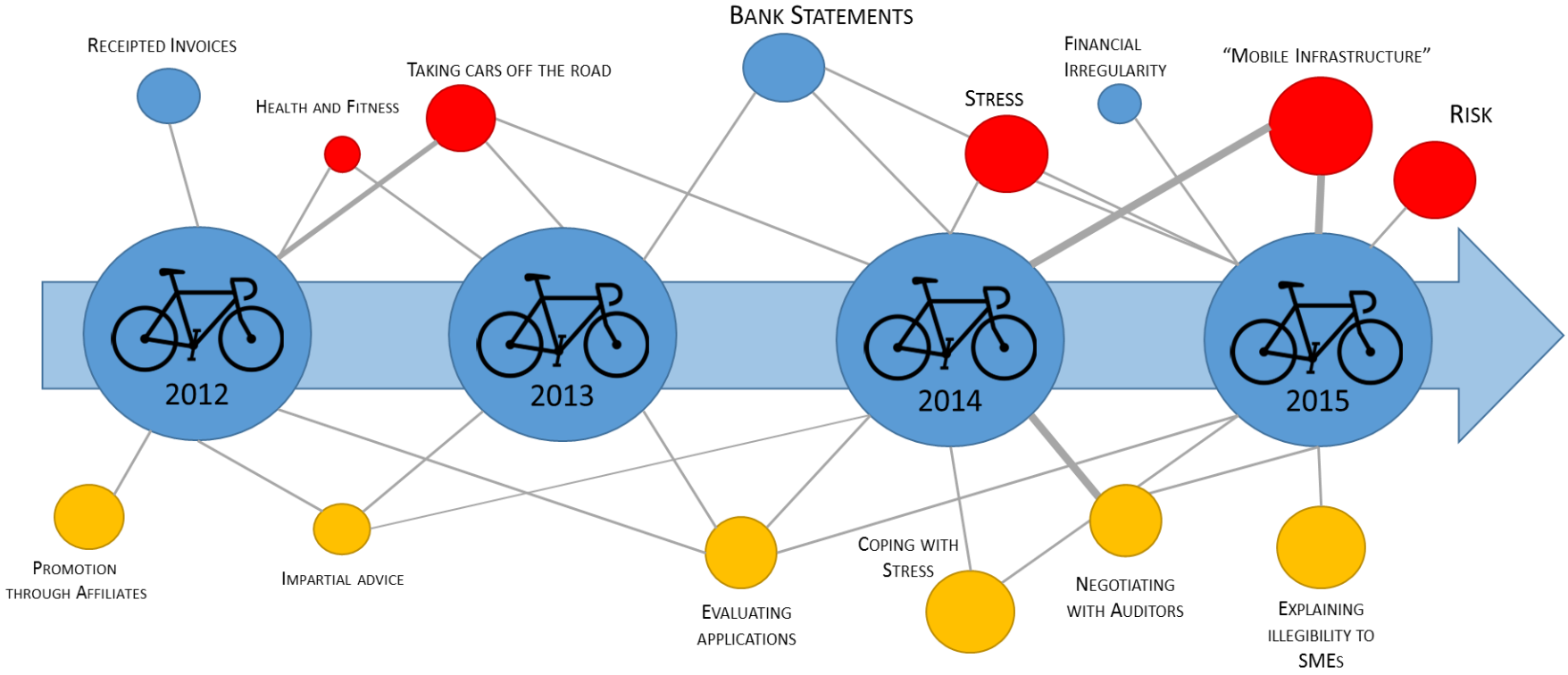


Figure 7-7 - Tracing the relational dynamics of a single material element: the bicycle

This example further illustrates the importance of discretion in policy implementation, which can operate in different ways. On the one hand, the inclusion of 'mobile infrastructure' by the DCLG official was an unfavourable use of discretion, leading to risk. On the other hand, the fact that the request was made by a parallel project meant that there was no explicit effort to seek out cases of ineligible investment on Sustainable Routes. It would be left to a combination of sampling probability and auditor discretion whether these risk-laden bicycles would lead to financial penalties.

The bicycle example shows the value of practice theory as an analytical framework. Its flat ontology enables us to focus on a single material element and to trace its changing relationships with other elements (Nicolini, 2016, 2009; Spurling and McMeekin, 2015). By following the relational dynamics of hybrid elements, a practice perspective helps to construct an account of implementation which reflects the unfolding, emergent experiences of all those involved in the project.

7.7.4 MEASURING CO_2 SAVINGS

Like all publicly funded behaviour change programmes, Sustainable Routes was subject to specific targets, known as 'indicators'. Given the central purpose of the project was to reduce SME transport emissions, a key indicator for the project was 'Tonnes of CO_2 saved'. Although the target of 4,600 tonnes remained unchanged, like the bicycle, its role in the wider assemblage shifted as a result of audits, fines and institutional restructuring.

Sustainable Routes' targets had originally been set by the Regional Development Agency. However, when this body was disbanded, a number of regionally specific targets, including 'Tonnes of CO_2 saved' were not incorporated into the updated indicator guidance document. This led to an impasse:

> 'It would be impossible for our policy colleagues to give any advice to somebody in the south west on a particular indicator, because it would be a different activity in the north east. So that wouldn't have happened.' (DCLG employee).

Instead, projects such as Sustainable Routes had to rely on guidance written before any projects had been commissioned, which was inevitably outdated and unfit for purpose. Guidance for some targets was thorough and specific. Evidencing 'Jobs Created' for example, required copies of employment contracts, job descriptions and letters from beneficiaries with 'wet ink signatures'. However, there was no official guidance regarding the calculation of 'Tonnes of CO_2 Saved' despite this being the central aim of the project.

With no guidance, the calculation of the project's CO_2 savings relied on self-reporting of saved mileage by SMEs and a number of assumptions about vehicle efficiency and continued behaviour change. One interviewee reflected on this unaudited methodology:

> '[The measurement of CO_2] didn't work at all… it literally was…pick a figure in the air'.

Although the primary objective of Sustainable Routes was to deliver SME travel behaviour change, respondents expressed doubt that sustained emissions reductions were being achieved to the degree reported. This point was made explicitly by one interviewee:

> 'It's not about low carbon at all actually… it's satisfying the [European] Commission that the programme is being delivered in a compliant and eligible way'. (DCLG employee).

Findings also suggest low levels of knowledge and competence relating to environmental sustainability. For DCLG in 2007, the low carbon Priority Axis in the south-east ERDF programme represented a new focus, outside their conventional scope of work:

> 'Was it carbon? ... carbon emissions saved or you know, lowered or something. I couldn't get my head around that because that's not my specialism. You're giving me the figures but I can't verify that they're accurate because I don't have the tools' (DCLG employee).

This low level of environmental literacy was not confined to individual DCLG employees, but apparent in policy documentation, where the official target required measuring 'Tonnes of CO_2 saved' rather than CO_2e (carbon dioxide equivalent), the standard metric for measuring emissions. Measuring CO_2 alone fails to account for non-carbon greenhouse gases, including those arising from transport emissions such as nitrous oxide (N_2O).

> 'The aspiration is there but people writing programmes don't really understand it'. (ERDF advisor).

These findings show that the CO_2 target was peripheral within the everyday practices of implementing Sustainable Routes. It suffered from not being encoded in guidance documentation, and from the lack of consensual motivation or environmental literacy across the coalition of actors. The story of the CO_2 target is the antipodal corollary of the ever-greater prominence of risk and financial documentation. As these elements took more time and attention from the carriers of practice, less was invested in accounting for the environmental performance of the project.

At the point of its final closure, the project reported having saved 4,676 tonnes of CO_2 as a result of reduced SME transport emissions. However, there was no officially sanctioned methodology for assessing this impact, and it was never audited. The case of the CO_2 target can be seen as a form of *systemic* discretion. Whereas the examples of discretion relating to bank statements and bicycles may be seen as more or less *benevolent* moves to circumvent stifling bureaucracy, the measurement of CO_2 – an important project

objective - was neglected. Discretion in this case was not simply a question of individual choice exerted by street-level bureaucrats, but resulted from low levels of knowledge and motivation on behalf of DCLG officials and auditors, and insufficient guidance. It may also have been a response to issues such as financial documentation taking prominence, and a tacit appreciation of the bureaucratic burden placed on project teams as a result. Already stretched auditors and DCLG officials may have been reluctant to begin stringent and conflict-inducing auditing of an environmental metric on which they had little expert knowledge.

Although the project was designed with greenhouse gas emissions reductions as a core objective, environmental accounting is a nascent subject within the history of regional policy implementation. Its position within the wider structures of policy implementation is peripheral and fragile compared to established frameworks for financial reporting. As the practices involved in Sustainable Routes' implementation mutated over time, and elements such as risk, compliance and documentation came to the fore, this policy objective was squeezed aside.

It is likely to be some time before CO_2 measurement achieves the same prominence as financial accounting within policy implementation. However, the case of Sustainable Routes identifies an opportunity for improved environmental literacy amongst certain actors including DCLG policy officials, and a need for supporting documentation to guide coalitions through project implementation. In designing new initiatives, there is an opportunity to build greater flexibility into policy governance. In practice, this would mean creating 'living' policy documents by designing mechanisms for case learning and review. Rather than providing risk-laden interpretations of specific sentences in guidance

documents, policy officials could offer advice and build closer relationships with actors at other levels of governance, including project managers and evaluators.

7.8 CONCLUDING THOUGHTS

Starting with MLG as a descriptive framework, this paper has taken on the ambitious challenge of using practice theory to analyse a multi-actor, multi-scalar transport-related behaviour project. Given the difficulties of applying practice theory in a policy context, this exploratory usage aims to contribute to the debate on how best to use it for research on complex bundles of practice. This section reflects on this paper's theoretical contribution and discusses implications for future research.

Whereas practice theory has been conventionally used within energy research to investigate clearly delineated practices such as showering and cycling, this paper has applied the rich framework provided by practice theory to a broader bundle of energy-related social activity. This is challenging for a number of reasons. Firstly, as a large-scale phenomenon, policy implementation is made up of multiple smaller practices such as auditing or negotiating. This makes conducting interviews with individuals more challenging. Unlike showering, the implementation of a project such as Sustainable Routes is not performed in discrete instances by individuals, but is constructed through 'chains' of performances, connecting the practices of multiple actors, spanning scales (Nicolini, 2016). As part of a *coalition of carriers* of this practice-bundle, individuals were able to talk freely about their own smaller-scale, subsidiary practices (Hitchings, 2012). However, in order to construct an account of implementation as a *whole*, it was necessary to supplement these partial accounts with auto-ethnographic reflections and a close attention to material artefacts such as policy guidance documentation.

Second, examining a large-scale practice-bundle inevitably provides only a partial account, as the wealth of data involved requires the researcher to 'zoom in' on particular performances (Nicolini, 2009). Given the scale of Sustainable Routes, running over six years and involving a range of actors, this account focused on instances of tension and disruption. Tracing how elemental dynamics and inter-actor relationships unfolded in response to external interventions such as audits and institutional restructuring, insights were provided into the evolution of the practice-bundle as a whole.

There are clear empirical challenges associated with researching complex bundles of practice, and few studies have applied the principles of practice theory to such a large-scale phenomenon as policy implementation. Appropriating tools developed to analyse individual practices, this paper has demonstrated that practice theory can be used to offer an alternative perspective on practice-bundles, generating valuable insights into a rich set of qualitative data.

Firstly, starting with a flat ontology, it resists the temptation to focus on individuals or institutions, but constructs an account of implementation which emphasises the role played by a variety of socio-material elements. This ontological impartiality allows the research lens to be focused on material elements, tracing how guidance documentation and bank statements became more prominent over the course of the policy lifecycle; their associated meanings and competences changing even where the physical materials remained unchanged. An in-depth look at the role of the bicycle demonstrates how these objects had initially been associated with 'making a difference', later becoming imbued with risk as reinterpretation of policy guidance led to a change in the constellation of elements.

Second, like other research on policy implementation (Evans, 2011; Proudfoot and McCann, 2008; Tummers and Bekkers, 2014), the account of Sustainable Routes demonstrated the important role of discretion. Conventionally, discretion is considered to be a question of choice, exercised by individuals, endowed with institutional responsibilities. However, a practice theory perspective offers an alternative view. Instead of being solely a product of an individual's attitude and motivation, the examples of discretion as performed within Sustainable Routes may be seen outcomes of the relational assemblage which constitutes implementation practice. This represents an avenue for future research on policy implementation using a practice theoretical lens.

Third, the collaborative methods used in this paper suggests that practice theory is not only valuable as a framework for analysing data, but can help to engage policy practitioners in ongoing reflection. Co-creating diagrams with interviewees helped to uncover aspects of practices which did not readily emerge from interviews. At first, discussions tended to focus on the meanings associated with the project, such as stress brought about by audits and institutional change. The three-element model then initiated discussions on how new and existing skills had been developed and applied, and how material elements such as bicycles and guidance documents became focal points, around which meanings evolved. These findings concur with Nicolini's observation that practitioners 'are always thirsty for descriptions of their daily practical concerns' (Nicolini, 2016). For future social scientific research on the practices of policy officials, this not only indicates the value of the three-element model as an interview aid, but also a potential means of integrating social theory into policy discourse (Hampton and Roberts, 2017).

Finally, in deconstructing notions such as scale and power, practice theory challenges taken-for-granted 'levels' of governance. Encouraging close analysis of raw data, this approach allows the researcher to trace the flows of power and influence from the ground up (Watson, 2016). In this paper, auto-ethnographical data provided an intimate view into the tensions and struggles between Sustainable Routes actors, zooming in on the ways that meanings, materials and competences were shared and exchanged (Nicolini, 2009). It is from these relational dynamics that large-scale phenomena, such as policy implementation, emerge. While MLG suggests that relationships between actors are often 'non-hierarchical' (Marsden et al., 2014), it is through a close attention to implementation as practice that the precise character of these interwoven relationships becomes clear. Close analysis of Sustainable Routes showed that at times these relationships were characterised by the top-down wielding of power, while at others, inter-actor dynamics involved multi-directional exchanges. In all cases, it is through the recruitment of elements in connected performances that such dynamics were played out.

Contributing to the debate over the use of practice theory to research large-scale phenomena, this empirical account has used its associated analytical tools experimentally, to demonstrate the potential of practice theory for analysing multi-actor, multi-scalar research data. The three-element model has uncovered a variety of insights, diagrammatically portraying the flows and exchanges of meanings, materials and competences, carried by individuals in bundles of practice-performances, traversing time, space and scale, in *connected situations* (Nicolini, 2016). With no shortage of energy related phenomena spanning spatial and temporal scales, further exploration of this potential, including the development of new theoretical tools, represents an avenue for future research.

7.9 REFERENCES

Affolderbach, J., Schulz, C., 2016. Mobile transitions: Exploring synergies for urban sustainability research. Urban Stud. 53, 1942–1957. https://doi.org/10.1177/0042098015583784

Anderson, L., 2006. Analytic Autoethnography. J. Contemp. Ethnogr. 35, 373–395. https://doi.org/10.1177/0891241605280449

Brondizio, E.S., Ostrom, E., Young, O.R., 2009. Connectivity and the Governance of Multilevel Social-Ecological Systems: The Role of Social Capital (SSRN Scholarly Paper No. ID 1599083). Social Science Research Network, Rochester, NY.

Brown, A.D., Colville, I., Pye, A., 2015. Making Sense of Sensemaking in Organization Studies. Organ. Stud. 36, 265–277. https://doi.org/10.1177/0170840614559259

Bulkeley, H., Betsill, M., 2005. Rethinking Sustainable Cities: Multilevel Governance and the "Urban" Politics of Climate Change. Environ. Polit. 14, 42–63. https://doi.org/10.1080/0964401042000310178

Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., Goodwin, P., 2004. Smarter choices-changing the way we travel, Final report of the research project: "The influence of soft factor interventions on travel demand." Department For Transport.

CLG Committee, 2012. Communities and Local Government Committee - Second Report on the European Regional Development Fund. House of Commons.

DCLG, 2012a. The National ERDF Handbook, For the English Convergence and Competitiveness Programmes 2007-2013. Department for Communities and Local Government, London.

DCLG, 2012b. ERDF National Eligibility Rules. Department for Communities and Local Government, London.

DCLG, 2009. ERDF User Manual. Department for Communities and Local Government.

Eadson, W., 2014. Towards a spatially and socially embedded approach to SME support for carbon reduction. People Place Policy Online 8, 129–138. https://doi.org/10.3351/ppp.0008.0002.0004

Ellsworth-Krebs, K., Reid, L., Hunter, C.J., 2015. Home-ing in on domestic energy research: "house," "home," and the importance of ontology. Energy Res. Soc. Sci. 6, 100–108. https://doi.org/10.1016/j.erss.2014.12.003

Evans, T., 2011. Professionals, Managers and Discretion: Critiquing Street-Level Bureaucracy. Br. J. Soc. Work 41, 368–386. https://doi.org/10.1093/bjsw/bcq074

Galvin, R., Sunikka-Blank, M., 2016. Schatzkian practice theory and energy consumption research: Time for some philosophical spring cleaning? Energy Res. Soc. Sci. 22, 63–68. https://doi.org/10.1016/j.erss.2016.08.021

Gram-Hanssen, K., 2010. Standby consumption in households analyzed with a practice theory approach. J. Ind. Ecol. 14, 150–165. https://doi.org/10.1111/j.1530-9290.2009.00194.x

Guardian, 2012. Bonfire of the quangos: the victims. The Guardian.

Gustavsson, E., Elander, I., Lundmark, M., 2009. Multilevel Governance, Networking Cities, and the Geography of Climate-Change Mitigation: Two Swedish Examples. Environ. Plan. C Gov. Policy 27, 59–74. https://doi.org/10.1068/c07109j

Hampton, S., 2017. An ethnography of energy demand and working from home: Exploring the affective dimensions of social practice in the United Kingdom. Energy Res. Soc. Sci. 28, 1–10. https://doi.org/10.1016/j.erss.2017.03.012

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Hampton, S., Roberts, A., 2017. Behavioural economics vs practice theory: a policy professional's perspective, in: Energy for Society. Presented at the First International Conference on Energy Research and Social Science, Sitges, Spain.

Hand, M., Shove, E., Southerton, D., 2005. Explaining Showering: a Discussion of the Material, Conventional, and Temporal Dimensions of Practice. Sociol. Res. Online 10, hand.

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

Hitchings, R., 2012. People can talk about their practices. Area 44, 61–67. https://doi.org/10.1111/j.1475-4762.2011.01060.x

Hooghe, L. (Ed.), 1996. Cohesion Policy and European Integration: Building Multi-level Governance, 1 edition. ed. Oxford University Press, Oxford ; New York.

Hooghe, L., Marks, G., 2003. Unravelling the Central State, but How? Types of Multi-Level Governance. Am. Polit. Sci. Rev. 97, 233–243.

Hui, A., Schäfer, H., 2015. Practice Theory Methodologies [WWW Document]. Pract. Theory Methodol. URL https://practicetheorymethodologies.wordpress.com/ (accessed 10.12.17).

IEA, 2015. Accelerating Energy Efficiency in Small and Medium-sized Enterprises, Policy Pathway. International Energy Agency, Paris.

Institute for Fiscal Studies, 2015. Recent cuts to public spending.

Keller, M., Halkier, B., Wilska, T.-A., 2016. Policy and Governance for Sustainable Consumption at the Crossroads of Theories and Concepts. Environ. Policy Gov. 26, 75–88. https://doi.org/10.1002/eet.1702

Kuijer, L., 2014. Implications of Social Practice Theory for Sustainable Design (PhD Thesis). Delft University of Technology.

Madsen, L.V., Gram-Hanssen, K., 2017. Understanding comfort and senses in social practice theory: Insights from a Danish field study. Energy Res. Soc. Sci. 29, 86–94. https://doi.org/10.1016/j.erss.2017.05.013

Maréchal, K., Holzemer, L., 2015. Getting a (sustainable) grip on energy consumption: The importance of household dynamics and 'habitual practices.' Energy Res. Soc. Sci. 10, 228–239. https://doi.org/10.1016/j.erss.2015.06.013

Marks, G., 1993. Structural policy and multilevel governance in the EC, in: Cafruny, A., Rosenthal, G. (Eds.), The State of the European Community (Vol. 2): The Maastricht Debates and Beyond. Lynne Rienner, Boulder, CO, pp. 391–410.

Marsden, G., Ferreira, A., Bache, I., Flinders, M., Bartle, I., 2014. Muddling through with climate change targets: a multi-level governance perspective on the transport sector. Clim. Policy 14, 617–636. https://doi.org/10.1080/14693062.2014.905823

Matland, R.E., 1995. Synthesizing the implementation literature: The ambiguity-conflict model of policy implementation. J. Public Adm. Res. Theory 5, 145–174.

Nicolini, D., 2016. Is small the only beautiful? Making sense of "large phenomena" from a practice-based perpsective. pp. 98–113.

Nicolini, D., 2009. Zooming In and Out: Studying Practices by Switching Theoretical Lenses and Trailing Connections. Organ. Stud. 30, 1391–1418. https://doi.org/10.1177/0170840609349875

O'Neill, O., 2002. Reith Lecture 4: Trust and Transparency, Reith Lectures 2002. Liverpool.

Ostrom, E., 2015. Governing the commons: the evolution of institutions for collective action, Canto classics. Cambridge University Press, Cambridge.

Patterson, K., Grenny, J., McMillan, R., Switzler, A., 2011. Crucial Conversations Tools for Talking When Stakes Are High, Second Edition. McGraw Hill Professional.

Pickering, A., 1995. The Mangle of Practice: Time, Agency, and Science. University of Chicago Press.

Proudfoot, J., McCann, E.J., 2008. At Street Level: Bureaucratic Practice in the Management of Urban Neighborhood Change. Urban Geogr. 29, 348–370. https://doi.org/10.2747/0272-3638.29.4.348

QandA Research, 2015. Sustainable Routes: Final Evaluation.

Reardon, L., Marsden, G., 2016. Steering Demand – A Wicked Problem in the Making: Insights from UK Transport Policy. Presented at the DEMAND Conference, Lancaster University.

Reckwitz, A., 2002. Toward a theory of social practices: a development in culturalist theorizing. Eur. J. Soc. Theory 5, 243–263.

Revell, A., Rutherfoord, R., 2003. UK environmental policy and the small firm: broadening the focus. Bus. Strategy Environ. 12, 26–35. https://doi.org/10.1002/bse.347

Sahakian, M., Wilhite, H., 2014. Making practice theory practicable: Towards more sustainable forms of consumption. J. Consum. Cult. 14, 25–44. https://doi.org/10.1177/1469540513505607

Schatzki, 2001. Introduction: practice and theory, in: Schatzki, T., Von Savigny, E. (Eds.), The Practice Turn in Contemporary Theory Eds Schatzki, Knorr Cetina, Von Savigny. Routledge, London, pp. 1–14.

SEEDA, 2007. South East England 2007-13 ERDF Competitiveness Operational Programme. South East England Development Agency.

Shove, E., 2016. Steering by accident: unintended governance strategies in action. Presented at the DEMAND Conference, Lancaster University.

Shove, E., 2014. Putting practice into policy: reconfiguring questions of consumption and climate change. Contemp. Soc. Sci. 9, 415–429. https://doi.org/10.1080/21582041.2012.692484

Shove, E., 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. Environ. Plan. A 42, 1273–1285. https://doi.org/10.1068/a42282

Shove, E., 2003. Converging conventions of comfort, cleanliness and convenience. J. Consum. Policy 26, 395–418. https://doi.org/10.1023/A:1026362829781

Shove, E., Pantzar, M., 2007. Recruitment and Reproduction: The Careers and Carriers of Digital Photography and Floorball. Hum. Aff. 17. https://doi.org/10.2478/v10023-007-0014-9

Shove, E., Pantzar, M., 2005. Consumers, producers and practices: understanding the invention and reinvention of Nordic walking. J. Consum. Cult. 5, 43–64. https://doi.org/10.1177/1469540505049846

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Shove, E., Walker, G., 2014. What is energy For? Social practice and energy demand. Theory Cult. Soc. 31, 41–58. https://doi.org/10.1177/0263276414536746

Sovacool, B.K., 2014. What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda. Energy Res. Soc. Sci. 1, 1–29. https://doi.org/10.1016/j.erss.2014.02.003

Spurling, N., McMeekin, A., 2015. Interventions in practices: Sustainable mobility policies in England, in: Strengers, Y., Maller, C. (Eds.), Social Practices, Intervention and Sustainability: Beyond Behaviour Change. Routledge, London.

Staddon, S.C., Cycil, C., Goulden, M., Leygue, C., Spence, A., 2016. Intervening to change behaviour and save energy in the workplace: A systematic review of available evidence. Energy Res. Soc. Sci. 17, 30–51. https://doi.org/10.1016/j.erss.2016.03.027

Strengers, Y., Maller, C., 2011. Integrating health, housing and energy policies: social practices of cooling. Build. Res. Inf. 39, 154–168. https://doi.org/10.1080/09613218.2011.562720

Tummers, L., Bekkers, V., 2014. Policy Implementation, Street-level Bureaucracy, and the Importance of Discretion. Public Manag. Rev. 16, 527–547. https://doi.org/10.1080/14719037.2013.841978

Warde, A., 2005. Consumption and theories of practice. J. Consum. Cult. 5, 131–153.

Watson, M., 2016. Placing power in practice theory, in: Hui, A., Schatzki, T., Shove, E. (Eds.), The Nexus of Practices: Connections, Constellations and Practitioners. Routledge, London.

Watson, M., 2012. How theories of practice can inform transition to a decarbonised transport system. Spec. Sect. Theor. Perspect. Clim. Change Mitig. Transp. 24, 488–496. https://doi.org/10.1016/j.jtrangeo.2012.04.002

Whatmore, S., 2006. Materialist returns: practising cultural geography in and for a more-than-human world. Cult. Geogr. 13, 600–609. https://doi.org/10.1191/1474474006cgj377oa

Whittle, R., Ellis, R., Marshall, I., Alcock, P., Hutchison, D., Mauthe, A., 2015. From responsibility to accountability: Working creatively with distributed agency in office energy metering and management. Energy Res. Soc. Sci. 10, 240–249. https://doi.org/10.1016/j.erss.2015.08.002

8. PAPER 5: BEHAVIOURAL ECONOMICS VS SOCIAL PRACTICE THEORY: PERSPECTIVES FROM INSIDE THE UNITED KINGDOM GOVERNMENT

ABSTRACT

This paper contributes to the ongoing debate on the role of the social sciences in influencing energy and environmental policy. It presents the views of research professionals inside government on the apparent stand-off between proponents of behavioural economics and adopters of social practice theory in academic energy research.

Drawing on auto-ethnographic insights and interviews with government social researchers (GSRs) working on energy and climate change, we chart the rise of behavioural economics within the UK government, discussing the reasons behind its success, and its limitations. GSRs' perspectives on energy research using practice theory are presented, juxtaposed with arguments which help to explain why policy engagement is not a ubiquitous ambition for all energy researchers.

We find that government social researchers actively engage with a range of theoretical approaches and social scientific methods. They express enthusiastic interest in research using practice theory, but point to a need for applicable evidence if they are to use it in their own practice. Applying insights from the two theories themselves, we tentatively

suggest ways in which GSRs could help, and be helped, to incorporate practice theory into mainstream policy discourse.

Keywords: behavioural economics; practice theory; nudge; energy policy

8.1 INTRODUCTION

Behavioural economics has become one of the most successful social sciences when it comes to influencing energy policy discourse. Moving beyond *homo economicus* as a way of understanding energy behaviours, it highlights how individuals can be subject to systematic bias, and may be 'benevolently nudged' towards policy goals such as reduced energy consumption (Thaler and Sunstein, 2008). Proponents of practice theory in the energy research community have criticised the behavioural economics approach, arguing that 'nudge' interventions fail to challenge the systems and structures which embed patterns of energy consumption into the social world (Chatterton and Wilson, 2014; Shove, 2010). Rather than focus on the individual as the principle unit of research, this approach, developed primarily in sociology, places the *practice* at the centre of analysis.

The goal of this paper is to contribute to the ongoing debate on the role of the social sciences in influencing energy and environmental policy (Castree and Waitt, 2017; Cooper, 2017; Keller et al., 2016; Reid and Ellsworth-Krebs, 2018; Stern, 2017). Presenting perspectives from inside government, it addresses the apparent standoff between proponents of behavioural economics and adopters of social practice theory in academic energy research. Our focus is on the UK, which has become a leader in applying behavioural economics to policy, particularly since the formation of the Behavioural Insights Team (BIT) in 2010. Established by David Cameron's new coalition government, BIT has now gained global influence (BIT, 2016a). Meanwhile, UK energy

researchers have also been at the forefront of developing, applying and debating practice theory (Darnton et al., 2011; Chatterton, 2011; see also debates initiated by Shove, 2010; and Cooper, 2017). Although we focus on a single country and two distinct theories, the paper makes a contribution to understanding the relationship between research and policy, with international relevance.

Our empirical investigation seeks to understand how social research is used to inform policy development, and the reasons behind the relative success of behavioural economics in gaining influence within the UK government. The paper draws on auto-ethnographic insights and a set of in-depth interviews with civil servants working on energy, environment, sustainability and transport policies across Whitehall[8] departments. Some social scientific literature has argued that government policy making is wedded to the epistemic tradition of methodological individualism, and the notion of individual behaviour change (Shove, 2010). However, we show that GSRs are both aware of and open to non-individualistic social science including practice theory. We discuss the reasons why practice theory remains peripheral within mainstream policy discourse, presenting perspectives from GSRs, juxtaposed with arguments which help to explain why policy engagement is not a ubiquitous ambition for all energy researchers. Acknowledging the fervency of argumentation on all sides, and applying insights from the two theories themselves, we tentatively suggest ways in which GSRs could help, and be helped, to incorporate practice theory into policy discourse.

[8] 'Whitehall' is the road in London where a number of government departments are based, and is used as a short hand for central government.

8.2 LITERATURE REVIEW

8.2.1 BEHAVIOURAL ECONOMICS, BEHAVIOURAL INSIGHTS AND NUDGE

Moving beyond the idea that individual behaviour is motivated by purely rational economic decision making, behavioural economics draws on psychology and neuroscience to describe how individuals' behaviour, decision-making processes and thinking patterns can be subject to systematic bias. Amalgamating a range of concepts including advertising and marketing, behavioural economics has created its own distinct lexicon, with terms such as 'choice architecture', 'discounting' and 'loss aversion' describing factors which influence individual decision-making (Thaler and Sunstein, 2008).

Despite its name, behavioural economics is more aligned with psychology than economics, a point borne out by the fact that one of its best known figures Daniel Kahneman won the 2002 Nobel Memorial Prize in Economics for his contributions, despite reportedly never having taken a course in economics (Princeton University, 2004). Its nominal affiliation with economics, as well as the accessible writing of proponents such as Kahneman (2011) and Thaler and Sunstein (2008), have helped it to develop a following from public audiences and policy-makers around the world. In popular discourse the term '*Nudge*' (the title of Thaler and Sunstein's 2008 book) has become synonymous with behavioural economics itself, describing ways in which individuals can be benevolently influenced when making decisions. Underpinned by the concept of 'libertarian paternalism', nudge seeks to promote and defend the notion of individual choice, arguing for government policy which supports citizens to make decisions in their own best interests (Jones et al., 2011).

For over a decade the UK government has taken an active interest in the potential for behaviour change to contribute towards a low carbon transition, including commissioning large evidence reviews (Darnton, 2008), and generating its own models for behaviour change (DEFRA, 2011, 2008). Since 2010, when David Cameron became Prime Minister, behavioural economics has been gaining influence in UK public policy. Having declared *Nudge* to be his favourite book, he established the Behavioural Insights Team (BIT) within the Cabinet Office, recruiting Thaler as an official advisor. Nicknamed the 'Nudge Unit', BIT was given a cross-departmental remit and an initial requirement to recoup at least ten times its own annual running costs (C. Bell, 2013). It delivered on this goal, with successful projects such as adding the sentence 'pay your tax or lose your car' to car-tax reminder letters, and asking patients (rather than receptionists) to write out their own GP appointment cards to reduce missed appointments. BIT has been 'spun-out' of the Cabinet Office but continues to work with 15 government departments and agencies (BIT, 2016a), using the principles of behavioural economics to contribute towards policy areas as broad as health, education, crime, finance and energy (BIT, 2016b). As well as working with BIT, civil servants within Whitehall departments now conduct behavioural insights work themselves, or in collaboration with other third parties.

Academic critiques of behavioural economics have come from a variety of disciplines. Some authors take issue with the political and philosophical stance of libertarian paternalism, with its focus on the individual and ties to neoliberal economics. Jones et al (2011) draw on Foucauldian theories of governmentality and psychological power to identify how a new form of citizen is being created by libertarian paternalism; one which is both infantilised by nudges towards health, wealth and happiness, while conversely engaged with as a reflexive and analytical agent.

Despite claiming both influence from psychology and neuroscience, the distinction between the two is not always clear. Felson and Reiner (2015) argue that there has in fact been little empirical analysis of *how* nudges influence decision making using data and theories from neuroscience, nor is there adequate evidence on the longer-term impact of habituated responses as compared with reflexive decisions. Others have argued that invocations of neuroscience in bestsellers such as *Nudge* are often selective, unscientific and used to give authority to subjective argumentation (V. Bell, 2013; Epstein, 2016; Rose and Abi-Rached, 2014).

Addressing the policy implications of behavioural economics, Lodge and Wegrich (2016) argue that there is a rationality paradox at the heart of nudge. Whilst emphasising the bounds of rational choice for individuals, it does little to acknowledge the limits to rationality embedded in its own approach, as well as within government policy procedures. They argue that nudge assumes that the benevolent, rational policy-maker is able to identify bounded rationality in others and identify their suboptimal choices. In reality, the resources and approaches adopted by government limit their own rationality. Financial constraints, political priorities and a tendency towards confirmation bias are presented by the authors as factors contributing to a policy landscape that 'pretends to be evidenced based in order to find seemingly low cost, high-intelligence measures'. However, there is evidence that behavioural insights professionals are seeking to counter these criticisms, including critical reflections on trial design and the use of Randomised Control Trials (RCTs) (BIT, 2012; Sanders and Heal, 2016), developing the methodology design principles 'Test, Learn, Adapt (Haynes et al., 2012) and publishing negative findings (BIT, 2017). The Behavioural Insights Team have recently published a number of articles addressing this criticism under the heading 'behavioural government' (BIT, n.d.).

8.2.2 PRACTICE-INSPIRED CRITIQUES

While behavioural economics has been the subject of critiques from a variety of disciplines, it has been particularly lamented by energy researchers using practice theory. One criticism frequently made in the context of energy policy is that nudge is simply not ambitious enough to bring about the scale of change required to radically decarbonise the economy. Sceptical of epistemological models which focus on the individual, practice theorists have criticised the notion of behaviour change in research and policy (Shove, 2010). Instead, practice theory has been used to emphasise how energy demand is bound up within the doings and sayings of everyday life (Shove et al., 2012). Individuals do not seek to 'consume' energy for its own ends, but rely on it to facilitate everyday practices such as commuting to work, being comfortable at home, or laundering clothes (Shove, 2003). These energy-using practices have become embedded in contemporary social life, and rely on complex and embedded infrastructures such as national road networks, the domestic building stock and national electricity grids. Even if individuals were motivated through a variety of nudges to change their behaviours, there are myriad socio-technical structures that inhibit behaviour change. The next section introduces practice theory approaches to energy demand research, and discusses recent efforts to link this perspective to policy.

8.2.3 PRACTICE THEORY AND POLICY: A CONTESTED RELATIONSHIP

With roots in philosophy and sociology, theories of practice have become influential in social scientific research on energy and sustainable consumption. Rather than focus on the individual, these approaches take the *practice* as the unit of analysis, showing how social activity is made up of a constellation of human, material and discursive elements (Reckwitz,

2002). This framework offers insights into the establishment, development and trajectories of energy consumption, and has been employed to trace the lives of practices such as showering (Hand et al., 2005), cycling (Spotswood et al., 2015), laundry (Mylan and Southerton, 2017) and domestic lighting (Crosbie and Guy, 2008). The following review of literature focuses on how practice theory has been employed to comment on, critique, and envision alternative futures for energy policy.

Sahakian and Wilhite (2014) identify examples of city-scale policies including the 'London on Tap' initiative. This initiative sought to reduce the environmental impact of restaurants by normalising the ordering of tap-water. Supported by analysis and debate about this social norm in the press, by a competition for the design of a new carafe, and with a link to the charity Water Aid, the initiative sought to change the practice of consuming water alongside an expensive meal by addressing its multiple elements simultaneously. The authors highlight how the materials (water, glass packaging), meanings (conventions around proper behaviour in restaurants), and competences (the performance of fine dining) were all affected by the multi-dimensional campaign, using this as evidence that there is potential for practice-informed policy initiatives to influence more sustainable forms of consumption.

Larsen (2017) uses social practice theory to investigate cycling practices in Copenhagen. Widely considered to be a global leader in urban cycling, many explanations for its success focus on its physical infrastructure investments. However, Larsen identifies ways in which the municipality sought to normalise cycling, by de-politicising the practice and counteracting the development of oppositional discourse between motorists and cyclists. Adopting Shove et al's (2012) three-element model, he also highlights the ways in which

policy interventions helped to develop *competences*, through public campaigns. Larsen argues that while these supportive planning practices have helped to mould practice 'entities'; it is through heterogeneous performances of everyday cycling that the practice has become embedded in urban life. This practice-informed conclusion helps to show that policy-makers and city planners are not solely responsible for influencing urban transport, but their actions can help to shape the trajectories of practice.

One policy example stands out in practice-based energy research due to the frequency by which it is cited by authors and offered as an example of multi-factorial policy. 'Coolbiz' was an initiative of the Japanese Ministry of the Environment in 2005. As part of a drive to reduce the energy consumption of government buildings, a policy decision was taken to expand the 'envelope' of accepted indoor temperatures: heating and air-conditioning would no longer operate at indoor temperatures between 20°C and 28°C (Shove et al., 2012). In support of this change in building management policy, the government also changed their guidance on acceptable workplace clothing, encouraging the use of loose fitting garments and short sleeved shirts. Clothing brand Uniqlo supported the move by stocking a new range of professional clothing, and the Prime Minister was photographed wearing short-sleeved shirts without a necktie (Shove, 2014). Although the initiative was not directly inspired by theories of practice, it has been promoted as an example of multi-elemental policy and a potential model for similar energy-demand policies in future (Evans et al., 2012; Shove, 2014).

Such rich policy case studies are rare however. Coolbiz continues to be cited as an example in energy literature despite now being over a decade old, with few efforts to replicate this being found internationally. A number of authors have called for more

'practicable' applications of practice theory, to 'deliver new insights on policy levers for influencing change towards more sustainable consumption practices' (Sahakian and Wilhite, 2014; see also Keller et al., 2016).

Directly addressing a policy audience and acknowledging the influence of psychological models of behaviour, Tim Chatterton has sought to integrate practice theory with behavioural approaches (2011; Chatterton and Wilson, 2014). Acknowledging the limited influence of energy sociology within policy, a recent publication includes a call for the policy-influential field of social marketing to adopt the principles of practice theory (Spotswood et al., 2017). This paper builds on earlier work including Hargreaves' (2011) and Spotswood et al's (2015) attempts to add theoretical depth to behaviour change initiatives by incorporating a practice perspective.

Another key figure who has written extensively on different models of behaviour for a government audience is Andrew Darnton (2008; Darnton et al., 2011). His 'Individual-Social-Material Tool (ISM)' integrates – without assimilating – insights from both behavioural science and practice theory. It emphasises the relationships between *individuals'* values, beliefs, skills and habits; the *social* context, including norms and meanings, institutions and networks; and the *material* environment including technologies, infrastructure and rules and regulations (Darnton et al., 2013). This approach has informed the Scottish Government's efforts towards meeting its Emissions Reductions Targets, helping to promote the uptake of solid wall insulation, electric vehicles and walking for short journeys (Scottish Government, 2013).

Concerned with moving policy 'beyond behaviour change', a number of authors have explored how practice theory might permeate the processes of policy making and

implementation (Spotswood, 2016; Strengers and Maller, 2015). Reflecting on their attempts to integrate practice-based ideas of social change when consulting on three conventional behaviour change projects, Strengers et al (2015) found that despite having limited impact on the way the projects were implemented, they were able to 'broaden the definition and scope of what it means to do social change'. In the same collection, Spurling and McMeekin (2015) identify three forms of intervention available to policy-makers aiming to steer mobility practices: recrafting elements of existing practices; substituting practices; and changing how practices interlock. Critical of policy approaches which design 'external' and 'one-off' interventions for behaviour change, they call for a new policy paradigm which acknowledges the complexity of, and connections between, systems of practice. Given that demand for mobility is related to the 'multiple domains of life, including work, leisure and the home', they call for a reframing of the problem in policy discourse, and for innovative solutions which cut across the jurisdictions of traditional government departments. Promoting the growth of working from home practice, for example, may involve adapting building codes and standards, corporate norms and information technology (Hampton, 2017).

In the UK, some attempts have been made to draw together policy-makers, businesses and researchers from a variety of academic disciplines to provide a platform for sharing ideas and approaches to sustainability policy. These include The Nexus Network (Cairns et al., 2017), the Centre for the Evaluation of Complexity Across the Nexus (CECAN) (Sheate et al., 2016) and the IEA's Task 24 project focused on Demand Side Management. For some researchers however, such efforts are not radical enough, and attempts to create interdisciplinary coalitions often fail to acknowledge fundamental epistemological differences. Shove, for example, has argued that disciplinary framings of problems such

as climate change are rooted in traditions of knowledge production that are like 'chalk and cheese' (Shove, 2011). In a seminal paper, she argues that current government behaviour change policy is bound up in the logic of methodological individualism, and marginalises more ambitious attempts to steer energy consuming practices at a societal scale (Shove, 2010). Shove has distanced herself from incremental efforts to influence policy making while this paradigm persists; arguing that while efforts to integrate practice theory with behavioural approaches 'might look like fruitful integration, such moves are doomed to failure' (Shove, 2010).

Shove's deliberately provocative writings have led to much debate on the interaction between social theory and policy, including an exchange which became known as the 'chalk and cheese debate' (Whitmarsh et al., 2011; Shove, 2011; Wilson and Chatterton, 2011). Sidestepping the challenge of reconciling epistemological differences, Wilson and Chatterton (2011) call for a more pragmatic approach to climate change policy, including a more neutral definition of behaviour as 'observable action'; not confined to individuals, nor at odds with a practice perspective. Rather than lament the government's framing of climate policy, they argue that 'the introduction into government of new approaches needs to be done at a practical level, alongside currently accepted models, as a necessary prerequisite to the contestation of the dominant theories of behavioural and social change' (2011, p. 2786).

A recent editorial by Keller *et al.* critiques the 'position of pure theorising' adopted by some proponents of practice theory (2016). They argue that such a 'comfortable' position has the effect of perpetuating the 'short-sighted and resource-wasting behaviour change efforts'. For these authors, 'even if theories do not directly translate into the daily nitty-gritty

of policy-making and implementation, they can inform and inspire'. The debate will continue within the academic literature on the trade-off between the practical opportunities and the theoretical compromises involved in seeking to link practice theory with policy. What is clear is that energy researchers setting out with this aim face the *dual* challenge of finding a receptive audience within government *and* addressing opposition from within the academy.

8.3 GOVERNMENT SOCIAL RESEARCH

GSR is one of 25 civil service professions, with researchers recruited from a variety of disciplinary backgrounds and working across Whitehall departments. The role of a GSR involves keeping abreast of academic debates, absorbing contributions from contemporary social science, using insights and evidence from research, and commissioning studies and reports where specific research gaps are identified. GSRs 'measure, describe, explain and predict social and economic phenomena', to an audience of policy-makers and ministers, and are guided by a Competency Framework which emphasises the use of sound methodologies and scientific principles (GESR Team, 2017). Government social research was formalised as a profession in 2000, but has been the subject of little research.

Two studies stand out as exceptions to this rule. In their extensive discussion of evidence, research and public services, Nutley et al (2007) chart the rise of government social research in the UK, which flourished under the Blair administration. Having been peripheral within the systems of professions which constituted the Civil Service (Abbott, 1988), one of Blair's ministers said:

> Social science should be at the heart of policy making. We need a revolution in relations between government and the social research community – we need social scientists to help to determine what works and why, and what types of policy initiatives are likely to be most effective. (Blunkett, 2000, cited by Nutley et al, 2007)

The authors describe how the number of GSRs doubled from 1997 to 2007, as the notion of evidence-based policy became dominant. Starting out with high expectations, Nutley et al suggest that in Blair's third tenure, a degree of disillusionment had set in, as the contribution of social research evidence toward major policy initiatives such as the Crime Reduction Programme had not prevented it missing its goals. Critiquing the framing of research evidence within policy discourse, they argue that the critical question at the interface of social research and policy is not *whether* evidence is used, but *how* it is used.

Kattirtzi provides another comprehensive account of GSRs in the UK, focusing on the period 2001-2015. He found that this community of practice were epistemically diverse and dynamic, meaning that they drew on a range of social scientific research, and adapted their methodological approach and messaging to suit different audiences (Kattirtzi, 2016). Focusing on the role of GSRs in two UK government departments with responsibility for energy, climate and environmental policy, this study found that as a product of the 'challenge function', which is inscribed in their professional practice, meaningful changes had been achieved in policy processes. Whereas Nutley et al indicate that government social research had reached its height in policy discourse in the early 2000s, this study indicates that they had retained influence, and had secured a jurisdiction within the systems of professional practices of Whitehall (Abbott, 1988).

8.4 METHODS

The idea for this paper emerged from a knowledge exchange meeting between a team of Government Social Researchers and a research group at a UK university. At the meeting, the two authors of this paper gave surprisingly similar presentations on behavioural approaches to energy research and practice theory, leading to further discussion and collaboration.

This paper combines data from two main sources. Firstly, a series of discussions between the authors produced a wealth of notes and transcribed recordings. The first author is a university-based researcher, with recent experience of implementing behaviour change programmes for small and medium sized enterprises (SMEs) on a regional basis. The second author is a GSR with experience of working across central government. With a background in psychology and quantitative methods, their work now focuses on behavioural insights. This author has actively developed links with academics and takes a keen interest in applications of behavioural economics as well as practice theory. Auto-ethnographic reflections on over a decade of professional experience as a GSR inform the analysis and argumentation (Anderson, 2006). This includes experience of training, knowledge-exchange, commissioning and evaluating research projects.

Second, semi-structured interviews with other researchers currently or recently working in central government were recorded and transcribed verbatim. Participants were selected using snowball sampling, starting with the immediate professional network of one author. Participants included six GSRs, one policy official, and one university researcher with experience of working within government. There are roughly 1,000 government social researchers in total. However only a small number work on energy, and even fewer GSRs are familiar with both behavioural economics and practice theory. All interviewees had

research training, with three qualified to PhD level. Disciplinary backgrounds ranged from economics, statistics (2), to psychology (2), sociology (2), geography and public policy, and all had worked on policies relating to energy demand. Given the necessarily small sample, the findings should not be interpreted as representative of the views of all GSRs.

Interview data was coded and categorised according to themes emerging from discussions. It is worth noting that for several participants, the interview was the first time they had explicitly reflected on and compared the two approaches. Following the production of a draft manuscript, a process of 'member checking' was then undertaken, to amend and refine contributions (Bradshaw, 2001).

We aim to clearly distinguish the views of participants and the interpretations and arguments made by the authors. As such, verbatim quotations are featured throughout the following section. The arguments made in the concluding sections are based on the authors' interpretations and analysis.

8.5 FINDINGS

8.5.1 THE USE OF RESEARCH AND EVIDENCE IN POLICY

'Evidence' is a more appropriate term than 'research' for describing the pragmatic ways that government researchers draw on academic work. Revealing of the pragmatic approach taken by government is the frequency by which the question 'what works?' was used by interviewees, and in policy literature (DECC, 2012; DfT, 2016).

This phrase describes a distinct approach to social research, and became embedded in government thinking through the creation of the 'What Works Network' in 2014. With seven centres dedicated to producing, evaluating and disseminating robust evidence

across a range of policy areas, their audience includes institutions within and outside of government. *What works* is now a phrase used within government to refer to a particular set of methodological principles, including a framework for evaluating evidence. However, in this paper, it is interpreted more broadly, as a way of describing an epistemological approach.

As trained researchers, GSRs see themselves as intermediaries, liaising between academia and other civil servants, including those responsible for generating policy. Interviewees claimed to be open to a variety of research methods and types of evidence, pointing to inter-disciplinary approaches used in internal policy evaluations, the breadth covered by The Magenta Book (HM Treasury, 2011), and other innovative methods (Sheate et al., 2016). However, it also became clear that the processes of developing social and environmental policy at the national scale were influenced by a distinct epistemological paradigm which prioritised reproducibility, generalisability and tended to examine individual behaviours over broader societal change. Several interviewees described how randomised control trials (RCTs), which are widely used in the medical sciences, had become the preferred method for establishing reliable, generalisable, 'good' evidence.

The use of RCTs to test policy interventions relating to energy demand divided interviewees, with one expressing frustration and describing the technique as a 'category error' when applied to socially embedded energy behaviours. Conversely, another bemoaned the rarity of quantitatively evaluated studies, describing them as a 'piece of gold' which would take 'centre stage'. For most interviewees, RCTs represented one of a variety of research tools; valuable when testing particular interventions, but limited in providing wider insights about the nature and dynamics of energy demand:

> 'Society is evolving all the time and an RCT assumes that what you're looking at is a universal finding and can be applied in any context you look at, but that's… not the case in social life. RCTs are great in a medical context, less so in a social context.'
>
> 'The trials are always about the impact, there is not much in there about 'why' necessarily.'
>
> 'We think about the instances where we could do a tightly controlled RCT. Where we could just tweak, or do one thing versus another. But there aren't that many things. So if we're doing a trial you want to think about something more comprehensive than the RCT approach, it's hard.'

These quotations indicate that as a group of highly trained interdisciplinary social scientists, GSRs were acutely aware of the narrow epistemological tradition within which they worked. However, this reflexiveness also extended to an empathetic understanding of the pressures, constraints, priorities and educational and political backgrounds of their audience of policy-makers and ministers who rely on researchers to understand and translate key concepts. Despite being epistemologically broad and methodologically balanced, policy colleagues were likely to be more focused on shorter term horizons, more attuned to political sensitivities, and as one GSR put it, more likely to say 'where is the number?'.

8.5.2 'INTUITIVELY IT CLICKS WITH PEOPLE': THE INFLUENCE OF BEHAVIOURAL ECONOMICS AND NUDGE

Given their appreciation of various research methods and theoretical approaches, interviewees were asked how and why behavioural economics had become influential within the current political and policy-making paradigm in the UK. From their responses

four themes emerged: accessibility, co-option, evidence and applicability. Each of these are described alongside quotations from interviews in Table 8-1.

Table 8-1 - Reasons behind the success of behavioural economics in policy.

Theme Description	Interview Quotations
Accessibility	
• Use of human-scale stories and narratives which resonate with audiences at all levels. • Accessible books including Nudge have helped to generate public enthusiasm. • Recognised figures such as Richard Thaler and David Halpern have been critical to its development.	• 'Intuitively it clicks with people and you can see that they're understanding the concepts, and it's not just highfaluting academic language. They see it as instantly as something they can relate to, because that's the way they think themselves. I don't think you can get that with social practice theory.' • '[The success is] mainly because of the nudge unit. People still recognise it when you say something. It's got that brand.' • '[On BIT] they're very slick… They've got all these snazzy tools, techniques - things that are really easy for policy-makers to grasp, and lots of nice case studies.' • 'Behavioural insights have had a champion at the heart of government for 8 years, and that's not to be underestimated.' • '[BIT are] seen as accessible, quite commercially savvy.'
Co-option	
• Behavioural economics has produced a distinct set of terms and concepts which helps to establish a broad and inclusive framework. It has done so by co-opting ideas from a range of disciplines, including psychology, neuroscience and economics.	• 'It's hard to describe where behavioural economics ends and psychology begins. It's all bundled into one thing.' • 'The principles are the same. It's still psychology 101. It's good stuff, because it's spoken in a language which is amenable to classical economists.' • 'I think the language is important because economics is the dominant analytical profession.'
'Evidence'	
• Behavioural nudges are amenable to testing using methods such as RCTs. These produce quantitative outcomes which can be integrated with economic analysis.	• 'The answers from nudge type research are quite clear. In general, clarity of message around findings and what you do with findings has a huge impact on the actual uptake of them.' • 'If we have an estimate of percentage, and you can put into a model and get a cost and an impact, then that just fits the process of policy making that we have.' • 'The test that is relevant for us is 'is it better than the other evidence that we have?' Just because we don't know everything, doesn't mean it's not the best of a bad bunch.'

Applicability	
• Nudge policies can be tested at a variety of scales and deployed incrementally. • They appeal to policy-makers operating with constrained budgets and timescales for interventions.	• 'Nudge approaches to energy saving; they're relatively small impacts, but they're still worthwhile doing, because if they're not that expensive to implement… then why not.' • 'You don't have to change legislation. You can undertake a nudge project and implement any successful interventions very quickly. Whereas if you want to change the driving test, that's going to be a really long piece of work, it's going to require years of work.' • 'It is just small changes, which are essentially free to do. Changing wording on letters. It's working I think because it goes: 'hey here's what we're doing already and have been doing for years, and here's just a little tweak and it has this benefit.' • 'You can always start from little things and work up. People want to do something now, rather than waiting.'

As well as describing in detail and with relative consistency the reasons behind behavioural economics' success, GSRs were aware of its limitations. Whereas 'nudges' had been applied in tax policy and operations with successful outcomes, similarly designed trials concerned with reducing energy demand had not produced significant change in behaviours. One interviewee had worked with BIT to test the effect of providing households with information and advice about heating controls:

> GSR: 'We looked at when people get an annual gas boiler safety check, using that as an opportunity to provide people with information and advice. We worked with BIT to develop an RCT to test whether or not those who received info and advice used any less gas.'
>
> Interviewer: 'And what did you find?'
>
> GSR: 'They didn't, no. There are a lot of reasons for that. It might be because you need more than just a one-off intervention. There is literature that says to change people's habits and behaviours through smoking, eating healthily, drinking, it requires a drip feed of information from a number of different

> sources rather than just a one-off thing to change ingrained habits around how you heat homes… But it was useful because it showed that we need to do more than just give people information leaflets.'

Another example mentioned in two interviews was a recent BIT report (2017) on a trial of interventions for changing commuting behaviours at Heathrow. Interventions included sending emails to workers to increase car sharing, the offer of a one-week free bus pass and a one-to-one discussion about travel choices. The report found that light-touch nudges had not been effective at changing travel behaviours. For one interviewee, this demonstrated the limitations of nudge-style policy interventions such as targeted information and personalised emails, and confirmed that reducing car journeys required investment in quality public transport services, and disincentives such as parking charges:

> 'Where the bus is more expensive than driving, people are not going to find themselves on a bus by accident!'

However, another interviewee emphasised the positives in this BIT report, arguing that well-designed research with negative outcomes can be valuable for policy-makers:

> 'Even if you don't find positive impacts from behavioural insights, like with the Heathrow trials, an RCT can be a very useful way of saying 'if it doesn't work, then we shouldn't fund this'. In fact it's a bit of a godsend, because those type of approaches are already being used across the country, and we fund them. So we are now more certain that these type of approaches don't work, and we'll be more sceptical about funding them in future.'

Another GSR argued that where nudge interventions had been successful, they often build on changes to social norms already taking place, and rely on 'hard levers' such as regulation to provide a foundation:

> 'Everywhere where they've introduced nudges, the social norm has been in the direction of travel. Otherwise it's not a nudge, it's an obstacle. Where it's really had an impact is where there is an intrinsic driver already.'

All interviewees mentioned the fact that energy consumption is the result of a variety of factors and behaviours cannot be removed from their social context. The scope of nudge interventions was cited as a significant limitation:

> '2-3% is better than nothing. For nudge that's par for the course. But for the kind of wholesale change that we need to drive in the energy and climate change space, that's not enough. You need much bigger, more effective measures.'

These quotations demonstrate that the interviewees were aware that the scope of behavioural economics was not sufficient to match the scale of change necessary to meet stretching climate targets. However, GSRs' ability to effect change is mediated by the structures surrounding them, including the design of energy markets and the remits and norms of government institutions. For example, one interviewee who had previously worked for the Department of Energy and Climate Change (DECC[9]) said:

> 'DECC didn't have job centres, we didn't send out tax forms. We didn't actually have any public facing stuff… everything we did was delivered via energy suppliers, through installers, through putting incentives out there for a market.'

[9] DECC was dismantled in 2016, with the majority of its civil servants becoming part of the newly created Department for Business, Energy and Industrial Strategy (BEIS).

In addition to these structural constraints, another GSR described how DECC's remit stretched across all sectors of the economy, meaning that his role spanned households across the UK, as well as businesses of all sizes:

> 'What can I hope to achieve? Nothing unless I can boil it down into meaningful, tangible chunks.'

This is an important perspective from within government, particularly when juxtaposed against some social scientific energy research which calls for more ambitious, cross-jurisdictional energy policy (Cox et al., 2016; Shove, 2014; Spurling and McMeekin, 2015; Spurling and Shove, 2014). Behavioural economics, as opposed to practice theory, can more readily be condensed into such 'chunks'. This finding shows that a broad remit can be perceived as negative by civil service professionals.

8.5.3 GSR PERSPECTIVES ON PRACTICE THEORY

For the GSRs interviewed for this paper, practice theory represents a radically alternative approach to understanding energy demand. Most agreed that its strengths include offering historical perspectives on the trajectories of energy consuming practices; providing understandings of wider socio-material contexts; and helping to explain why interventions with more narrow approaches do not succeed.

Whereas nudge instruments are short term in nature, practice informed analyses of energy demand draw lessons from outside the scope of conventional policy evaluation timescales. Spurling for example, traces the development of central heating and the changing internal layouts of domestic properties following the switch from Town Gas to Natural Gas in the 1970s (Spurling, 2015). Such contributions were welcomed by GSRs working with large portfolios of energy and climate policy. One interviewee, for example, had worked

alongside policy teams to address the long-term challenge of decarbonising heat in the UK, which amounts to 40% of final energy consumption (Committee on Climate Change, 2016). They described the multiple challenges this problem presented to government. Firstly, given drastic changes in heating practices in the recent past, predicting future demand was difficult. Second, there was no clear technological solution, with electrification and the use of hydrogen involving major transformation and expense. These, combined with the fact that energy prices are politically, socially and ethically charged, meant that the scale of the problem far outstretched solutions which could be informed by behavioural economics.

For each of the GSRs interviewed, practice theory offered a radically different way of framing energy consumption when compared to other approaches which take demand for energy services as a given (Shove, 2017). One interviewee for example, described the 'revelatory' moment when practice theory had helped them to realise that 'people don't consciously use energy… they do other things'. However, despite this GSR and other interviewees citing the strengths of practice theory for understanding energy demand, they were aware of its limitations, just as they had been for behavioural economics. The challenge described by all was *how to use and apply* its insights in their own work. For several interviewees, the main barrier to using practice-based insights was a lack of applicable, suitable evidence:

> 'I see few examples of applying insights from SPT. But I recognise that it gives a true and valid description of what we can learn from changes in energy demand in the past.'

> 'We'd need to have something that's accessible, that's got some evidence underneath it, some case studies.'

For these GSRs, being able to point to tangible examples of fully evaluated policy interventions overseas, at a local scale or in another sector is crucial when presenting new ideas to policy-makers. Whereas behavioural economics has allied itself with quantitative methods and the RCT, practice theory has no parallel.

> 'If we could have some evidence on its application as well as theory…. We would be the ones who would be promoting it.'

> 'Social practice theory needs to be crystallised in concepts which people can understand. You need micro-applications of it. Little trials of social practice theory.'

> 'That's what you need - an *intentional* social practices approach, to give it ammunition.'

The example of the Japanese initiative Coolbiz was discussed with three interviewees who each acknowledged this as a success. However, two pointed out that this intervention had not been designed with practice theory in mind, and that they would need more examples, ideally from Britain, to support them if they were to promote similar cross-cutting policy approaches.

While the majority of respondents suggested that 'micro-applications' of practice theory would be crucial for it to gain more prominence within government social research and ultimately the policy agenda, one interviewee pointed to the fact that energy research informed by practice theory tended to highlight the need for larger scale change:

> 'Elizabeth [Shove] or others will say 'you need to change housing infrastructure, or heating infrastructure'. Really big stuff… She's absolutely right that it would take a national programme to make these changes, the way that there were national programmes to introduce electricity and etcetera. It's the

> scale that is daunting, and the question is whether there is an intermediate win. Nudges can be much, much smaller.'

This observation reveals the fundamental difference between a practice-based approach and the scope of UK energy demand policy as perceived by this GSR. While they agreed in principle with the vision and ambition of practice theory, they felt that their own role and those of policy-making colleagues was to seek more immediate, and necessarily smaller, solutions.

8.6 DISCUSSION

8.6.1 WHY POLICY ENGAGEMENT IS NOT THE GOAL FOR ALL SOCIAL SCIENTISTS

For many energy researchers using practice theory, the prevailing model of policy development in the UK is inadequate for several reasons. Firstly, the findings above indicate that the question of 'what works?' guides much of the work of GSRs. However, *what works* is a concept loaded with epistemological implications. In pursuing the goals of generalisability and reproducibility, the question lends itself to methods such as RCTs, where researchers can rigorously test hypotheses in controlled circumstances. However, RCTs work best when the research question is narrow, and factors which might complicate results are controlled. Given that energy demand is bound up in the myriad doings and sayings of social life, it is perhaps unsurprising that neither of the two UK trials cited by interviewees found any significant effect from the behavioural interventions tested.

Second, from the – notably broad - perspective of those using practice theory, government social research insufficiently accounts for the breadth of social scientific output. As argued by Flyvberg, social scientific research in policy making has become subject to the same

epistemic logic that underpins the natural sciences, to its detriment. Rather than seek to produce cumulative, predictive theory, he calls for social scientists to help articulate 'where we are, where we want to go, and what is desirable' (Flyvbjerg, 2001). Beyond generalisability and reproducibility, a more inclusive epistemic paradigm might include the principles of *exploration*, *experimentation, or participation.* Whereas in the findings above we saw GSRs call for an 'evidence base' to allow them to begin to use practice theory in their work, some social scientists would argue that the implied definition of evidence is problematic. What constitutes evidence in studies using practice theory is unlikely to be admissible in the current paradigm of 'evidence-based policy'. Seen from this perspective, the contributions of practice theory are unlikely to be fully appreciated by civil servant audiences, as they are underpinned by concepts which are axiomatically opposed to the prevailing model of government research.

Thirdly, some proponents of practice theory would argue that the GSR profession, embedded within the prevailing logic of policy development, is entwined with a neoliberal agenda, with its emphasis on individual choice and free markets (Cass and Faulconbridge, 2016; Jones et al., 2011). Previously criticised for its scant engagement with questions of political economy, practice theory is being increasingly used to address questions of power and politics (Watson, 2016). As such, *what works* begs the question '*for whom',* and '*to what end'.*

Fourthly, an argument consistently made by energy researchers using practice theory is that the scope and ambition of energy and climate policy in the UK is inconsistent with the scale of climate change as a challenge (Spurling and McMeekin, 2015). In a recent contribution, Shove argued that the policy goal of energy efficiency served to embed and

extend unsustainable practices and levels of service demand, which were fundamentally incompatible with the goals of the Paris Agreement (Shove, 2017). What society considers as non-negotiable 'needs', can be shown, with reference to historical expectations of comfort for example, to be changeable. The paper has proven unsurprisingly controversial, and has been criticised for lacking evidence to suggest that current service expectations cannot indeed be met with the sustainable supply of energy (Fawcett and Rosenow, 2017).

Proponents of practice theory have also directly critiqued the use of behavioural economics, as not only leading to insubstantial change in behaviour, but potentially working against efforts for more transformative change. Strengers (2011), for example, has argued that the introduction of smart meters into households could serve to be counter-productive to efforts to reduce consumption of energy and water. She suggests that 'nudges' focus on small, relatively easy changes to behaviour, providing rewarding feedback to the consumer conveying a moral 'good'. For Strengers, these interventions can detract from broader questions regarding which consumption practices are considered normal, necessary, and which might be negotiable. The study of commuting behaviours at Heathrow might be highlighted as an example of a behaviourally focused project which focuses on small scale change without addressing these more politically divisive questions (BIT, 2017). In seeking to influence the travel choices of those who work at the airport, this study ignored the far bigger issue of unsustainable flying practices, and the ongoing question of whether a third runway will be built.

Seen from the viewpoint of these notable practice theorists, GSRs working on energy and climate are not politically neutral, and might even counteract efforts for more ambitious policy. These critiques help to explain why many energy researchers drawing on practice

theory do not wish to engage with processes of policy making, nor government social research, within the current paradigm. However, precisely what a model of an alternative policy making regime would look like has not been clearly or extensively articulated in this literature. Practice theory has been primarily used in energy research to critique existing practices and policies, and as Shove says: 'social theories do not lead directly to prescriptions for action', but can nonetheless be 'relevant for how policy agendas are framed and for the kinds of intervention that are deemed possible, plausible or worthwhile' (Shove, 2014, p. 416).

8.6.2 GSRS AS A COMMUNITY OF PRACTICE

GSRs are the principle community of practitioners using and promoting social scientific work within the UK government and are a critical audience for researchers wishing to influence policy making, whether incrementally or transformatively. With this in mind, this section examines the practice of government social research in further detail, using contributions from both practice theory and behavioural economics.

As well as being proponents of behavioural insights, these GSRs working on energy and climate were aware of its limitations, particularly regarding the need for drastic decarbonisation of the economy. Our findings suggest that they are less wedded to this epistemological model, nor an individualist ontology than implied by 'straw man' representations of behaviour-focused policy in some sociological energy research. For example, Shove's representation of a dialogue with a policy-maker includes the question 'how can I persuade people to leave their cars at home?', to which her fictionalised researcher responds 'I don't think you will get very far if you continue to define your job as one of persuading individuals to change their ways, one by one' (Shove, 2014). Our

findings provide a more nuanced representation of GSRs working on energy and climate. While they are not enthralled to the notion of individual behaviour change, and are aware of the need for broader, structural change, they are themselves a community of practice, embedded in the institutional logics and traditions of government.

This is not to say that they are not important agents for change. As shown by Kattirtzi (2016), part of their function is to *challenge* established notions of citizenship, science, technological optimism and even the role of public policy itself within the institutions of government. GSRs' professional practice involves keeping abreast of a wide range of social scientific literature, incorporating expansive, radical discourses and a range of epistemological traditions and methodologies. However, the relatively new profession is steeped in the conventions of traditional policy development, in which the role of research is to help to minimise the unforeseen and undesirable consequences of policy interventions by testing and rigorously evaluating schemes at regional and local scales, or in trials with representative samples of a target population. Their practice is influenced by an epistemological paradigm which places the principles of generalisability and reproducibility at the centre of what constitutes admissible evidence.

Although practice theory has been used extensively to reveal insights into the ways society changes, it has been criticised by some authors for its ambivalent and underdeveloped vision for future change (Keller et al., 2016; Sahakian and Wilhite, 2014). As reviewed in section 2 of this paper, a number of recent studies have begun to address this criticism by focusing on the practices of actors most able to influence energy consuming practices such as city planners, business executives and policy-makers (Evans et al., 2012; Larsen, 2017; Shove, 2014), and to observe the influence of 'invisible' energy policies on demand

(Cox et al., 2016). Many authors have called for transformation in these systems of professional practice (Shove, 2014; Spurling and McMeekin, 2015; Strengers et al., 2015), but *how* radical change may be achieved remains an open question. Further research seeking to understand the practices and lived experience of influential practitioners such as civil servants is a good place to start, and this is a task that we hope to contribute to in this paper.

One participant in this study explained how they had previously worked at DECC, which had a remit which included energy consuming and carbon emitting activities across the domestic and non-domestic spheres. In principle, this cross-cutting remit has the potential to enable GSRs to draw together colleagues across government in order to develop policies commensurate with the multifactorial drivers of energy demand such as in commuting practices (Cass and Faulconbridge, 2016; Spurling and McMeekin, 2015). However, for this GSR, the breadth of their remit was a cause of frustration. Firstly, DECC - controlled by the junior partner in the 2010-2015 coalition government, the Liberal Democrats – is said to have been marginalised within Whitehall (Howard, 2016), meaning that its staff may have struggled to gather together coalitions of policy practitioners to address the interwoven nature of energy demanding practices. Secondly, such collaborations suffer from a lack of track-record, and initiatives such as CECAN (Sheate et al., 2016) and the Nexus Network (Cairns et al., 2017) that are already attempting to build collaborations across policy, business and academic disciplines, require significant resources and funding to be successful.

By contrast, behavioural economics has a much clearer framework for bringing about change, albeit incremental. For behavioural economists, achieving small-scale change within established systems of practice constitutes success. As one GSR put it:

> 'I think of nudge as working around the edges. It doesn't really tackle the big problems. It's good at working within the current legislative context'.

Although referring to policy interventions developed using behavioural insights, this quotation might also apply to their own experiences of working in government. Embedded within the system of professions which constitutes the UK civil service (Abbott, 1988), GSRs themselves work within the established norms and practices of government: a situation to which behavioural economics is well suited. For example, another interviewee described how they had drawn on the principles of nudge when presenting their work internally. Ironically, what they had learned from behavioural economics' propensity to co-opt ideas and reframe discourses using new language, they were using to introduce ideas from practice theory:

> 'I haven't been proving practice theory in practice, but I've been opening the door in with policy-makers by asking: 'we've got micro applications of behavioural economics, what have we got for macro?... It seems like it could be easy! Sociology and psychology: macro and micro economics!'

This interviewee saw an opportunity to integrate practice-based approaches where departmental remits included long-term transitions, such as in meeting the UK's 2050 CO_2 targets through BEIS' Carbon Budgets, or with the Treasury, which is concerned with long-term economic trends. They suggested that in promoting these ideas to policy-makers and ministers, GSRs could draw on ideas from nudge, using language carefully to make their message salient:

> 'At the very least, social practitioners should see the benefit of psychological approaches, if just to sell their idea to the people they need to sell it to, to give themselves that opportunity.'

The incremental model for change promoted by behavioural economics would appear to be more workable for the community of GSR practitioners as opposed to more radical calls for transformation made by practice theorists, given their position within the institutions and norms of government. However, the GSR quoted above refuted such a dichotomy, suggesting that there were more similarities between the two theoretical approaches than many wished to admit:

> 'Often when you hear explanations of what a social practices approach would look like, there is something in there which you could easily label a nudge! Once you admit that, you can start to see the two approaches in tandem.'

They pointed out that Coolbiz, often cited by practice theorists, is *also* promoted by social marketers (French, 2017; Shove, 2014). Recruiting the Japanese Prime Minister and a well-known brand to support the change in social norms could equally be claimed by behavioural economists as a form of 'framing', drawing on 'messenger effects', or individuals' preference for 'following the herd' (Thaler and Sunstein, 2008).

Although changing 'defaults' are often claimed as successes by behavioural economists, there are similarities between celebrated examples and conventional policy 'hard levers'. For example, when the UK government introduced pension auto-enrolment, the move was opposed by some small business groups based on resistance to additional 'red-tape'. This led the government to invest in costly measures such as providing administrative assistance to businesses, and a television and billboard advertising campaign to promote public acceptance of the change. One GSR pointed out how changing defaults was often

politically sensitive, with major public relations campaigns accompanying legislation such as mandating the wearing of seat-belts in motor-vehicles, or banning smoking in restaurants and pubs. They said:

> 'When it's just about changing regulation, which we always did, [behavioural economists] would say it's changing the default. Well, we've always done stuff like that!

The *co-option* of ideas and examples by behavioural economics was identified above as a factor behind its success; a strategy that several GSRs tentatively suggested could be adopted by other social scientists. An approach warranting exploration by those interested in making practice theory more prominent in policy might be to identify past interventions which had successfully *steered practices* towards lower energy demand. Presented as practice-changing policies, these could build the foundations for more purposive interventions in the future.

8.6.3 COULD GSRS BECOME ADVOCATES OF PRACTICE THEORY?

Considering GSRs as a community of practice, we see that they have a pluralistic approach to social science, but their practice is performed within the conventions of policy making and is guided by a pragmatism embodied in the question of *what works?* One contribution that practice theory can make to GSRs is to help them to reflect on their position within systems of professional practice in and outside of government. The nature of energy policy has shifted from a 'command and control' style of decision-making, and now involves multiple agents operating across 'levels' of governance (Hampton, 2018; Keller et al., 2016). If they were to become proponents of practice research, GSRs' practical influence on established policy-making processes may be limited, but as Keller et al (2016)

conjecture, by contemplating concepts from practice theory, they may help to 'induce policy and governance practitioners both to frame some issues differently than before and to experiment with new and fresh angles in intervention design'. While the arguments in section 6.1 explain why some practice theorists adopt an oppositional stance with regards to policy engagement, there may be ways in which GSRs might be supported to become champions of practice theory.

One critical issue which emerged from interviews was the need for an evidence base of practice-inspired studies and policy interventions, if GSRs were to become advocates of this approach to social research. Putting aside the important question of what constitutes admissible evidence as discussed above, there are in fact a number of studies which have produced the kinds of data and insights which may be readily used by GSRs. These include the Patterns of Water project (Pullinger et al., 2013), and METER (Grunewald, 2015), which have collected quantitative water and electricity consumption data respectively, linking these with household practices. Both projects have provided policy-relevant insights into consumption practices, segmenting their large samples by end-use practices and socio-demographic factors. Given that GSRs would welcome further projects in this mould, there is an opportunity to better promote those already completed and underway to this important community of practice. Responsibility for building an evidence base is not held solely by academic researchers however, and GSRs have an opportunity to become more than celebrants, but *carriers* of practice theory, by designing and commissioning research which they could incorporate into their work.

If GSRs are to use and promote practice theory in their work, two barriers identified during the analysis of interviews must be addressed. Firstly, several GSRs expressed unease with

using ideas from practice theory, and three interviewees caveated their statements with 'I'm not an expert, but…'. Compared with other social theory which they drew on, the practice theory that they had encountered had been difficult to comprehend:

> 'Once you get your head around it, you then need to be an expert before you start applying it. That's the kind of impression you get.'
>
> 'You can't apply social practice theory in a one-pager to a minister. You can apply nudging in a one-pager to a minister.'

Although practice theory offers a unique and distinctive perspective, we would argue that the principle of accessibility – one of the factors behind the success of behavioural economics - is not at odds with its contributions to energy research. In other words, for researchers wishing to promote the ideas and approaches from practice theory to GSRs, they must overcome its reputation for theoretical obscurity.

Secondly, the GSRs interviewed spoke of the difficulties of using appropriate language when articulating ideas from practice theory. They described the need to avoid using phrases like 'individual choice' and 'behaviour change', which from a practice theory perspective were 'dirty' words. One GSR who was passionate about the contributions practice theory might make to policy discourse but frustrated that disputed language was an apparent barrier, said: 'let them call it nudge!'. While they acknowledged the limits of methodological individualism, abandoning its associated lexicon across government discourse felt like a step too far. For these GSRs, although the value of practice theory can be partly attributed to its radically alternative conception of the social world (Reckwitz, 2002), when this strays into conceptual dogmatism and linguistic obduracy, its potential reach and impact becomes self-limiting.

8.7 CONCLUSIONS

Contributing to the ongoing debate over the impact of social sciences on energy policy, this paper has presented perspectives from government social researchers whose job it is to commission, translate and evaluate research for internal audiences. Interviews with a selection of GSRs have shown how research and evidence is used in the process of policy making in the UK, and their reflections on behavioural economics help to explain how and why it has achieved influence. By contrast, practice theory remains peripheral to the governance of energy and climate. GSR reflections on its contributions to energy research, as well as a summary of reasons why policy engagement is not a ubiquitous goal, have helped to explain why this is the case.

For social scientists wishing to gain influence within the existing structures of energy demand policy in the UK, GSRs are a critical audience. This paper has shown that despite the influence of behavioural economics and its associated methodological individualism, the GSRs interviewed are aware that individual behaviour change and nudge policies are limited in their ability to bring about the changes in energy demand required to meet UK carbon targets. When used by the government social researchers, the term 'behavioural insights' accommodates a wider range of research perspectives than behavioural economics alone, and GSRs working on energy policy are invested in using broader, sociological, geographical, anthropological or cross-disciplinary approaches to inform policy. This finding was strongly reiterated in the 'member checking' process. Energy demand is a complex, multi-dimensional social phenomenon, and the full spectrum of social science is required to help design, predict, interpret and evaluate the effects of policy interventions (Cox et al., 2016).

As a community of practice within government, GSRs occupy a unique position at the interface of research and policy. Consistent with their self-proclaimed pluralist approach to social scientific theory, the GSRs interviewed for this study were keenly interested in insights from practice theory and demonstrated an appreciation for the boldness and ambition of energy researchers using it. However, much work is needed if these GSRs are to draw more extensively on practice theoretical energy research in their own work, not least to overcome perceptions of its theoretical complexity and exacting approach to language and concepts. As things stand, the respondents in this study feel uneasy about using ideas and insights from practice theory, and were unconvinced about their ability to absorb these into their professional practice.

While GSRs are *epistemically* diverse, a significant barrier to integrating practice theory into their work was reported to be the need for particular kinds of evidence, commensurate with the methodological traditions of their developing profession. The current paradigm of 'evidenced-based policy' is focused on using quantitative research, which is not necessarily at odds with practice inspired research (Grunewald, 2015; Pullinger et al., 2013). We have argued that policy engagement is not a one way relationship, and given that part of GSRs' practice involves issuing calls for evidence and commissioning research projects, they could play an important role in addressing this barrier.

For some proponents of practice theory, achieving impact within the framework of the existing policy-making paradigm is neither realistic nor desirable. The scale of change required to satisfactorily address climate change cannot be met without a fundamental overhaul of policy making processes. How such a transformation could be brought about remains an open question. Nonetheless, more fully understanding existing governance

processes, and envisioning what alternative practices of governing could look like, are high on the social scientific research agenda.

In the meantime, this paper has shown that it is not impossible for practice theorists to have influence within the current paradigm, and we have suggested some avenues for further exploration. While GSRs are unlikely to adopt the more radical and transformational calls made in some practice-inspired energy research, for those working on intractable policy challenges such as decarbonising heat and influencing long term travel demand, there are ways in which their practice might be enriched and emboldened by the alternative perspectives it offers. What is clear is that there is both a need and potential for practice-theory inspired energy research to make a greater contribution to policy development.

8.8 REFERENCES

Abbott, A.D., 1988. The System of professions: an essay on the division of expert labour. Chicago, Chicago.

Anderson, L., 2006. Analytic Autoethnography. J. Contemp. Ethnogr. 35, 373–395. https://doi.org/10.1177/0891241605280449

Bell, C., 2013. Inside the Coalition's controversial "Nudge Unit."

Bell, V., 2013. Our brains, and how they're not as simple as we think. The Observer.

BIT, 2017. An Evaluation of Low Cost Workplace-Based Interventions to Encourage Use of Sustainable Transport (Client: Department for Transport). Behavioural Insights Team.

BIT, 2016a. The Behavioural Insights Team: Update Report 2015-16. Behavioural Insights Team.

BIT, 2016b. The Behavioural Insights Team: Update Report 2016-17. Behavioural Insights Team.

BIT, 2012. Designing interventions in partnership with the people who are going to deliver them. Behav. Insights Team.

BIT, n.d. Behavioural Government. Behav. Insights Team.

Bradshaw, M., 2001. Contracts and member checks in qualitative research in human geography: reason for caution? Area 33, 202–211. https://doi.org/10.1111/1475-4762.00023

Cairns, R., Wilsdon, J., O'Donovan, C., 2017. Sustainability in turbulent times: lessons from the Nexus Network for supporting transdisciplinary research.

Cass, N., Faulconbridge, J., 2016. Commuting practices: new insights into modal shift from theories of social practice. Transp. Policy 45, 1–14. https://doi.org/10.1016/j.tranpol.2015.08.002

Castree, N., Waitt, G., 2017. What kind of socio-technical research for what sort of influence on energy policy? Energy Res. Soc. Sci. 26, 87–90. https://doi.org/10.1016/j.erss.2017.01.023

Chatterton, T., 2011. An introduction to thinking about energy behaviour: A multi-model approach.

Chatterton, T., Wilson, C., 2014. The 'Four Dimensions of Behaviour' framework: a tool for characterising behaviours to help design better interventions. Transp. Plan. Technol. 37, 38–61. https://doi.org/10.1080/03081060.2013.850257

Committee on Climate Change, 2016. Next steps for UK heat policy. Committee on Climate Change.

Cooper, A.C.G., 2017. Building physics into the social: Enhancing the policy impact of energy studies and energy social science research. Energy Res. Soc. Sci. 26, 80–86. https://doi.org/10.1016/j.erss.2017.01.013

Cox, E., Royston, S., Selby, J., 2016. The impacts of non-energy policies on the energy system: a scoping paper. UKERC.

Crosbie, T. (Tracey), Guy, S. (Simon), 2008. En'lightening' energy use: the co-evolution of household lighting practices. Int. J. Technol. Manag. 9, 220–235. https://doi.org/10.1504/IJETM.2008.019035

Darnton, A., 2008. Practical Guide: An overview of behaviour change models and their uses (GSR Behaviour Change Knowledge Review). Centre for Sustainable Development, University of Westminster.

Darnton, A., Evans, D., Scotland, Scottish Government, 2013. Influencing behaviours: a technical guide to the ISM tool. Scottish Government, Edinburgh.

Darnton, A., Verplanken, B., White, P., Whitmarsh, L., 2011. Habits, Routines and Sustainable Lifestyles, AD Research & Analysis for Defra, London.

DECC, 2012. What Works in Changing Energy Using Behaviours in the Home? A Rapid Evidence Assessment. Department of Energy & Climate Change, London.

DEFRA, 2011. The Sustainable Lifestyles Framework.

DEFRA, 2008. A Framework for Pro-Environmental Behaviours. Department for Environment, Food and Rural Affairs.

DfT, 2016. What Works? Learning from the Local Sustainable Transport Fund 2011-2015. Department For Transport.

Epstein, R., 2016. Your brain does not process information and it is not a computer.

Evans, D., McMeekin, A., Southerton, D., 2012. Sustainable Consumption, Behaviour Change Policies and Theories of Practice. Collegium, Studies across Disciplines in the Humanities and Social Sciences 12, 113–129.

Fawcett, T., Rosenow, J., 2017. Commentary: What is right with energy efficiency? A response to Elizabeth Shove. BRI Community.

Felsen, G., Reiner, P.B., 2015. What can Neuroscience Contribute to the Debate Over Nudging? Rev. Philos. Psychol. 6, 469–479. https://doi.org/10.1007/s13164-015-0240-9

Flyvbjerg, B., 2001. Making social science matter: why social inquiry fails and how it can succeed again. Cambridge: Cambridge University Press, Cambridge.

French, J., 2017. Social Marketing Fostering Citizen Informed Experimentation.

GESR Team, 2017. Government Social Research Competency Framework, Government Social Research Profession. HM Government.

Grunewald, P., 2015. Measuring and Evaluating Time and Energy-use Relationships (METER). University of Oxford.

Hampton, S., 2018. Policy implementation as practice? Using social practice theory to examine multi-level governance efforts to decarbonise transport in the United Kingdom. Energy Res. Soc. Sci. 38, 41–52. https://doi.org/10.1016/j.erss.2018.01.020

Hampton, S., 2017. An ethnography of energy demand and working from home: Exploring the affective dimensions of social practice in the United Kingdom. Energy Res. Soc. Sci. 28, 1–10. https://doi.org/10.1016/j.erss.2017.03.012

Hand, M., Shove, E., Southerton, D., 2005. Explaining Showering: a Discussion of the Material, Conventional, and Temporal Dimensions of Practice. Sociol. Res. Online 10, hand.

Hargreaves, T., 2011. Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. J. Consum. Cult. 11, 79–99. https://doi.org/10.1177/1469540510390500

Haynes, L., Service, O., Goldacre, B., Torgerson, D., 2012. Test, Learn, Adapt: Developing Public Policy with Randomised Controlled Trials.

HM Treasury, 2011. The Magenta Book: Guidance for evaluation.

Howard, R., 2016. Green groups should embrace, not bemoan, the merger of DECC and BIS. Bus. Green.

Jones, R., Pykett, J., Whitehead, M., 2011. Governing temptation: Changing behaviour in an age of libertarian paternalism. Prog. Hum. Geogr. 35, 483–501. https://doi.org/10.1177/0309132510385741

Kahneman, D., 1934-, 2011. Thinking, fast and slow. First edition. New York: Farrar, Straus and Giroux, 2011.

Kattirtzi, M., 2016. "Challenge and Be Challenged": A History of Social Research Capacity and Influence in DEFRA and DECC, 2001-2015. University of Edinburgh.

Keller, M., Halkier, B., Wilska, T.-A., 2016. Policy and Governance for Sustainable Consumption at the Crossroads of Theories and Concepts. Environ. Policy Gov. 26, 75–88. https://doi.org/10.1002/eet.1702

Larsen, J., 2017. The making of a pro-cycling city: Social practices and bicycle mobilities. Environ. Plan. Econ. Space 49, 876–892. https://doi.org/10.1177/0308518X16682732

Lodge, M., Wegrich, K., 2016. The Rationality Paradox of Nudge: Rational Tools of Government in a World of Bounded Rationality. Law Policy 38, 250–267. https://doi.org/10.1111/lapo.12056

Mylan, J., Southerton, D., 2017. The Social Ordering of an Everyday Practice: The Case of Laundry. Sociology 003803851772293. https://doi.org/10.1177/0038038517722932

Nutley, S.M., Walter, I., Davies, H.T.O., 2007. Using evidence: how research can inform public services, University Press Scholarship Online. Policy Press, Bristol, U.K.

Princeton University, 2004. Daniel Kahneman: Department of Psychology [WWW Document]. URL http://web.archive.org/web/20041120195720/http://webscript.princeton.edu/~psych/psychology/research/kahneman/case.php (accessed 3.2.17).

Pullinger, M., Browne, A., Anderson, B., Medd, W., 2013. Patterns of Water. Lancaster University.

Reckwitz, A., 2002. Toward a theory of social practices: a development in culturalist theorizing. Eur. J. Soc. Theory 5, 243–263.

Reid, L., Ellsworth-Krebs, K., 2018. Nudge(ography) and practice theories: Contemporary sites of behavioural science and post-structuralist approaches in geography? Prog. Hum. Geogr. 030913251775077. https://doi.org/10.1177/0309132517750773

Rose, N., Abi-Rached, J., 2014. Governing through the Brain: Neuropolitics, Neuroscience and Subjectivity. Camb. J. Anthropol. 32, 3–23. https://doi.org/10.3167/ca.2014.320102

Sahakian, M., Wilhite, H., 2014. Making practice theory practicable: Towards more sustainable forms of consumption. J. Consum. Cult. 14, 25–44. https://doi.org/10.1177/1469540513505607

Sanders, M., Heal, J., 2016. Embracing insights from many sources.

Scottish Government, 2013. Influencing Behaviours - Individual, Social and Material (ISM) Tool. Progress Report.

Sheate, W.., Twigger-Ross, C., Papadopoulou, L., Sadauskis, R., White, O., Orr, P., Phillips, P., Eales, R., 2016. Learning lessons for evaluating complexity at the nexus: a meta-evaluation of CEP projects (Final Report to CECAN).

Shove, E., 2017. What is wrong with energy efficiency? Build. Res. Inf. 1–11. https://doi.org/10.1080/09613218.2017.1361746

Shove, E., 2014. Putting practice into policy: reconfiguring questions of consumption and climate change. Contemp. Soc. Sci. 9, 415–429. https://doi.org/10.1080/21582041.2012.692484

Shove, E., 2011. On the Difference between Chalk and Cheese—A Response to Whitmarsh et al's Comments on "beyond the ABC: Climate Change Policy and

Theories of Social Change." Environ. Plan. A 43, 262–264. https://doi.org/10.1068/a43484

Shove, E., 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. Environ. Plan. A 42, 1273–1285. https://doi.org/10.1068/a42282

Shove, E., 2003. Converging conventions of comfort, cleanliness and convenience. J. Consum. Policy 26, 395–418. https://doi.org/10.1023/A:1026362829781

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Spotswood, F. (Ed.), 2016. Beyond behaviour change: key issues, interdisciplinary approaches and future directions. Policy Press, Bristol.

Spotswood, F., Chatterton, T., Morey, Y., Spear, S., 2017. Practice-theoretical possibilities for social marketing: two fields learning from each other. J. Soc. Mark. 7, 156–171. https://doi.org/10.1108/JSOCM-10-2016-0057

Spotswood, F., Chatterton, T., Tapp, A., Williams, D., 2015. Analysing cycling as a social practice: An empirical grounding for behaviour change. Transp. Res. Part F Traffic Psychol. Behav. 29, 22–33. http://dx.doi.org/10.1016/j.trf.2014.12.001

Spurling, N., 2015. If the walls could talk: Central heating comes to Stevenage.

Spurling, N., McMeekin, A., 2015. Interventions in practices: Sustainable mobility policies in England, in: Strengers, Y., Maller, C. (Eds.), Social Practices, Intervention and Sustainability: Beyond Behaviour Change. Routledge, London.

Spurling, N., Shove, E., 2014. Developing DECC's Evidence Base: A commentary from the DEMAND Centre.

Stern, P.C., 2017. How can social science research become more influential in energy transitions? Energy Res. Soc. Sci. 26, 91–95. https://doi.org/10.1016/j.erss.2017.01.010

Strengers, Y., 2011. Negotiating everyday life: The role of energy and water consumption feedback. J. Consum. Cult. 11, 319–338. https://doi.org/10.1177/1469540511417994

Strengers, Y., Maller, C. (Eds.), 2015. Social Practices, Intervention and Sustainability: Beyond behaviour change. Routledge.

Strengers, Y., Moloney, S., Maller, C., Horne, R., 2015. Beyond behaviour change: practical applications of social practice theory in behaviour change programmes, in: Strengers, Y., Maller, C. (Eds.), Social Practices, Intervention and Sustainability: Beyond Behaviour Change. Routledge.

Thaler, R.H., Sunstein, C.R., 2008. Nudge: improving decisions about health, wealth, and happiness. Yale University Press, New Haven, Conn.

Watson, M.T., 2016. Placing power in practice theory, in: Hui, A., Schatzki, T., Shove, E. (Eds.), The Nexus of Practices: Connections, Constellations, Practitioners. Routledge, London.

Whitmarsh, L., O'Neill, S., Lorenzoni, I., 2011. Climate Change or Social Change? Debate within, amongst, and beyond Disciplines. Environ. Plan. A 43, 258–261. https://doi.org/10.1068/a43359

Wilson, C., Chatterton, T., 2011. Multiple Models to Inform Climate Change Policy: A Pragmatic Response to the 'Beyond the ABC' Debate. Environ. Plan. A 43, 2781–2787. https://doi.org/10.1068/a44404

9. CONCLUSIONS

Ensuring that SMEs play a full part in meeting the UK's stretching emissions reduction targets requires effective governance at national, regional and local scales. Policy and governance for SMEs is said to be dominated by the physical, technical and economic (PTE) model (Lutzenhiser, 2014; Wilson et al., 2015), and calls have been made for more in-depth, social scientific contributions (Janda et al., 2014, 2015; Shove and Walker, 2014; Sahakian and Wilhite, 2014; Keller et al., 2016).

This thesis set out to answer the research question: how can practice theory be used to improve the effectiveness of UK SME energy and environmental governance? This chapter concludes this research by explaining how the five empirical papers answer this question. It also reflects on the DPhil project as a whole to discuss its implications for research and governance.

The chapter is divided into three parts. Section 9.1 summarises the conclusions from the five empirical papers, explains how they contribute to answering the main research question and suggests areas for further work. It then provides a series of *meta*-conclusions based on the research as a whole. Section 9.2 provides reflections on the use of theory throughout the thesis and discusses implications for research. It also outlines the state of SME energy and environmental governance in the UK and considers the implications of this research for policy design and implementation after Brexit. Section 9.3 summarises this chapter and provides brief summative conclusions.

9.1 SUMMARISING THE CONCLUSIONS AND ANSWERING THE RESEARCH QUESTION

The section explains how the empirical papers answer the research question in two discrete ways. Given the emphasis on 'how' in the research question, one way of answering this is to *demonstrate* the value of practice theory by generating insights which can inform and improve governance processes. The first part of this section summarises the insights produced by each paper in turn. Taken together, these insights produce a *multifarious* answer.

Another way of answering the research question is to take a step back and consider what these multiple applications of practice theory tell us about efforts to contribute towards effective governance. What methods, theoretical adaptations and data formats are required to service this objective? What route would 'pathways to impact' need to take to translate findings into governance practice? The second sub-section provides some *meta*-conclusions which draw on the body of evidence as a whole to answer the research question in a summative and reflective manner.

9.1.1 ANSWERING THE QUESTION THROUGH DEMONSTRATION

9.1.1.1 PAPER 1: WORKING FROM HOME

This paper considers working from home as a practice and builds on the notion of affective satisfaction to reveal insights into energy consumption and conservation that are not visible using conventional physical, technical and economic approaches.

Findings indicate that achieving *comfort* adaptively and creatively, *controlling* one's close physical environment, and *flexibly* weaving practices such as laundry into the working day, are prevalent activities associated with home working. Each offer potential benefits

to the energy system, and challenge the conventional assumptions about energy service expectations which are integrated into energy demand models. These benefits could be capitalised on by those in positions to steer the practice, including policy-makers, regulators and employers.

Future research could (1) explore further applications of concepts from cultural geography in energy research; (2) test findings using representative sampling; or (3) implement a demand response trial which targets home workers.

9.1.1.2 PAPER 2: ENERGY MANAGEMENT IN SMES

Practice theory, in combination with the concept of sensemaking, reveals how energy management is embedded within processes of organisational knowledge and identity production. The two theories are found to be complementary. Sensemaking encourages a focus on organisations *as they happen,* and practice theory emphasises the role of materiality in organising processes.

Findings show that the effectiveness of expert advice depends on how it is absorbed into organising practices, which are in turn influenced by pre-existing cultures, norms and individual dispositions. Advisors tend to consider energy management as a primarily technical exercise, involving advanced skills and technological solutions. This colours their approach to advice-giving, and can serve to marginalise everyday know-how and practical intelligibility, including 'low-tech' solutions such as clothing. Findings indicate a need for advisors to attend to the narratives and practices of the organisations they support.

There is a need for further research focused on how SMEs' management of energy relates to their everyday practices and organisational cultures.

9.1.1.3 PAPER 3: LOW CARBON ADVISORS AS MIDDLE ACTORS

This paper builds on the findings in Paper 2 to investigate the practices of low carbon SME advisors. Given that policies across the OECD for bringing about the SME sustainability transition are largely incentive-based, this community is becoming increasingly important. Ethnographic methods and in-depth interviews reveal that their role requires a diverse range of competences including salesmanship, technical energy expertise, and 'soft skills'.

Additional challenges are generated by the wider context of governance practice in which low carbon advisors are embedded. Low levels of environmental competence amongst policy stakeholders, misaligned targets, artificially compartmentalised funding rules, short project timescales and frequent governance restructuring each hamper advisors' ability to deliver low carbon objectives.

Business support policy and practice are dominated by narratives focusing on growth and profitability, and the paper concludes that these are limited in the context of environmental objectives. They skew the reach of advisors, and can *side-line* alternative engagements, such as conversations about organisational culture, corporate responsibility, climate change, values, risk and understanding what energy is used *for*. Costly face-to-face meetings could be better utilised if 'softer' skills were deployed alongside technical expertise.

Further research is required on the crucial role played by low carbon advisors, including work to articulate what a 'softer' practice would involve, and could achieve.

9.1.1.4 PAPER 4: POLICY IMPLEMENTATION AS PRACTICE

This paper demonstrates how the three-element model of practice theory can be used to investigate multi-level policy implementation as a bundle of practices. Practice theory helps to deconstruct 'levels' of governance, illuminating examples of non-hierarchical dynamics within Sustainable Routes. A flat ontology reveals the importance of material elements such as bicycles, showing how their status can change over time as the practice-bundle is reconfigured.

Findings show how the effective governance of this environmental programme was inhibited by other priorities such as risk management, a rigid system of guidance, restricted powers of discretion, and a lack of skills and environmental literacy amongst key actors.

Future research is needed which applies practice theory to multi-actor, multi-scalar research data, particularly in the context of policy implementation.

9.1.1.5 PAPER 5: GOVERNMENT SOCIAL RESEARCH

While the first four papers demonstrate the value of practice theory for commenting on governance practices, the final paper explores whether practice theory could be used more directly, by government actors themselves.

Findings suggest that there *is* potential for practice theory to contribute to the policy-making cycle, but the question of *how* this contribution could be made is more uncertain. GSRs highlight the need for an evidence base of practice-inspired interventions, and the paper discusses what form this would need to take, and whether GSRs could champion the cause.

For some vocal practice theorists, engaging with the dominant paradigm of 'evidence-based policy' is counter-productive. Extant policy and governance practice are considered inadequate to deliver the transformational change needed to tackle climate change. However, the paper suggests that further research using practice theory is necessary to articulate what such radically alternative governance could look like. Researchers wishing to achieve policy influence in its existing form face the dual challenge of finding a receptive audience within government *and* addressing opposition from within the academy.

9.1.2 META-CONCLUSIONS

The previous sub-section summarised how the papers use practice theory to generate policy-relevant insights, and therefore present an answer to the research question in the form of a demonstration. However, the collective body of evidence presented in this thesis also enables broader conclusions to be made about efforts to use practice theory for more effective governance of the SME low carbon transition.

9.1.2.1 REFLECTIONS ON THE RESEARCH: KEY FACTORS FOR SUCCESS

In order to generate the insights summarised above, the research required privileged access to the sites, data and participants involved in the practices under investigation. Papers 2-5 relied heavily on my - and my co-author's - professional status and connections. For example, SMEs are notoriously difficult to recruit to research studies (Walton, 2015; Aykol and Leonidou, 2015), but through my role as a publicly funded advisor, I was able to select case studies from more than 50 SMEs that I had worked with on issues of energy and environmental impact. For Paper 3, being able to share experiences, knowledge and to empathise with the pressures faced by low carbon advisors helped to recruit them to the

study, and to uncover insights into their practices that would have been opaque to an outsider.

The research published in Papers 4 and 5 would not have been possible were it not for having privileged access to the practitioners in focus. However, each study encountered significant obstacles. For paper 4, accessing information and conducting interviews with ex-colleagues and partners involved negotiation which took several months. For example, my previous employer asked that I attended and supported them through an external audit in exchange for access. For Paper 5, my co-author was instrumental. Not only did he arrange interviews with the small number of GSRs who were familiar with practice theory, but more significantly, he helped to manage the 'member checking' process. The first draft manuscript generated consternation amongst some participants, and there was a real possibility of them withdrawing consent for the study. Given the small sample, this would have spelled an end to the project. However, as a trusted colleague, my co-author was able to ease tension, and recommend alternative phrasing and edits to the argument that would be less controversial.

As well as having privileged access, this research has required patience, persistence and critical reflexivity. For Paper 1, recruiting home workers involved reaching out through personal and professional networks, and exercising sensitivity when conducting interviews in their homes. Papers 2, 3 and 4 each benefitted from having developed professional relationships over several years, meaning that interviews built on a base of familiarity and trust. They also required a degree of critical introspection on my part, and this is revealed most prominently in Paper 2, which pivoted in focus over the course of the study. For Paper 5, it took 18 months and eight drafts before participants were happy for the manuscript to

be submitted to an academic journal. The member checking processes required a balance of flexibility and resolve in the face of pressure from government participants. This in itself was a test for a student-researcher, and I am grateful to my supervisors for their support though this process.

9.1.2.2 PATHWAYS TO IMPACT

The review of literature on practice theory and methodology in Chapter 3 found that ethnographic methods are well-suited to praxeological enquiry (Nicolini, 2012; Schmidt, 2016), and these featured in each empirical chapter which followed. However, the concluding observations in Paper 5 indicate that for practice theory to play a part in policy design and evaluation, there is a need for forms of evidence which have *not* been pursued in this thesis. The epistemological paradigm within which GSRs work requires that findings are reproducible and generalisable, and tends to favour quantitative research. This indicates that a full and comprehensive answer to how practice theory could make these governance processes more effective is likely to involve research conducted at a larger scale, with numerical components. While it is clear that none of the papers in this thesis fit this mould, they nonetheless help to provide the groundwork on which better-resourced research could build.

Although Whitehall-based GSRs are an important target for this research, they are not the only important governance practitioners with influence on the SME sustainability transition. The term governance has been interpreted liberally throughout this thesis, and the empirical findings have implications for dispersed governance practices at several levels. For example, Papers 3 and 4 draw attention to the importance of policy *implementation*

practices at regional and sub-regional scales; and Paper 2 uses organisational literature to reconceptualise SMEs as outcomes of continual organising (or governing) practices (Feldman and Orlikowski, 2011). Findings from each paper have the potential to influence governance practices in each of these domains.

The word 'potential' is instrumental here. As with most academic research setting out with the intention to influence policy and governance, its success depends on how, when and by whom it is translated into practice. One benefit of *demonstrating* the potential of practice theory in multifarious ways, through five publications, is that each application and its corresponding insights can be adopted and developed independently. For example, home workers could become the target for a demand-response initiative, or GSRs could fund a practice-theoretical research project in line with their epistemological conventions. Gratifyingly, the call made in Paper 3 for low carbon SME advisors' to be supported to enhance their capacity for 'softer skills' has been backed with 'Impact Acceleration Account' funding. Following the completion of this thesis I will be working with Open University and Climate Outreach on a project called 'Growing Greener', aiming to do just this. These conclusions indicate that pathways to impact could take a number of different routes, but each will rely on building partnerships with governance actors across the public and private sector.

For any social scientific theory to achieve policy influence, it is usually necessary for the most philosophically sophisticated concepts and convoluted language to be distilled and simplified. Energy researchers using practice theory have already made progress on this front, developing compelling heuristics such as the three-element model (Shove and Pantzar, 2005; Shove et al., 2012) and the 'bubble model' (Kuijer, 2014). This research

has further proven the value and accessibility of practice theory outside the research community by using it with research participants themselves. In Papers 2 and 4, the three-element model was used as an interview aid with gratifying results. Participants responded positively to a brief explanation of what it meant to research practices, and the diagram prompted them to consider their activities in new ways.

However, findings in paper 5 indicate that in some ways, practice theory remains inaccessible. GSRs expressed caution when using or talking about practice theory, wary of being accused of not fully understanding it. This may be because of the strict rules and boundaries that are sometimes imposed by its proponents. For instance, GSRs feared that 'individual choice' and 'behaviour change' were 'dirty' words which should be avoided when using and talking about practice theory. However, these strict rules belie the level of disagreement within the practice theoretical tradition, and the review of literature in Chapter 2 indicated that there are different schools of thought regarding the role of the individual (Spaargaren et al., 2016). While some variants elect to dispense with the individual entirely, others maintain that practice theory can be aligned with an individualist philosophy. Paper 5 concludes that cultivating accessibility will help to extend the influence of practice theory, but perhaps more significant is the need to be more philosophically permissive as a research community. This topic is discussed further in subsequent sections.

9.1.2.3 USING THEORIES IN COMBINATION

A final meta-conclusion relates to the philosophically liberal way that theory has been used in this thesis. In each empirical paper, practice theory is supported by combining or juxtaposing an additional concept or theory. These innovations enhance the analysis of

empirical data, helping to generate policy-relevant insights. For example, Paper 4 builds on the relatively normative multi-level governance framework as used in urban transitions studies. This structure is used to depict the interwoven practices involved in the implementation of Sustainable Routes, revealing how elements were shared and exchanged between different actors. In this combination, the descriptive nature of MLG complements the radical perspective of practice theory.

Motivated by the desire to make governance more effective, Paper 2 concludes that low carbon advisors could make their engagements with SMEs more impactful if they attend to *both* the everyday practices involved in using and managing energy, *and* the values held by individuals and embedded in organisational cultures. However, referring to the role of personal values and practice theory in the same concluding section is a controversial move, given debate on this topic in the recent past (Shove, 2010; Whitmarsh et al., 2011; Wilson and Chatterton, 2011; Shove, 2011). Nonetheless, as the GSRs in Paper 5 testify, philosophical dogmatism does little to further the cause of those wishing to achieve influence in the contemporary governance landscape.

These reflections on the use of multiple theories in combination lead to the conclusion that being philosophically liberal; methodologically explorative; and willing to use additional concepts to complement empirical research, are essential strategies for answering the research question.

9.2 REFLECTIONS AND IMPLICATIONS

This section discusses the contributions made in this thesis to academic literature and SME energy and environmental governance, and the implications of this explorative work for future research and practice.

9.2.1 REFLECTIONS ON THE USE OF THEORY AND ITS IMPLICATIONS

The previous section explained how the liberal stance taken towards the use of theory in this research was necessary to support the objective of applying practice theory to energy and environmental governance. As indicated in Chapter 2, a number of different models and frameworks for understanding and using practice theory for empirical research have been generated in the energy and environmental research literature (Warde, 2005; Gram-Hanssen, 2010; Stephenson et al., 2010; Shove et al., 2012). Of these, the three-element model has been most commonly used, adapted and developed (Kuijer, 2014; Higginson et al., 2015; Narasimhan et al., 2017).

Shove's accessible writing style and prominence in the field attracted my attention in the early stages of this DPhil project, and these contemporary theoretical innovations inspired me to integrate the three-element model into the research design. It is used in Papers 1 and 3 to support data collection and analysis; and features prominently in Paper 4, where I attempted my own innovation by combining it with the MLG framework to investigate policy implementation practice.

However, over the course of the research it became clear that the experiments that had inspired my research were more controversial than I had anticipated. This became clear during the peer review process for Paper 4. Due to disagreements amongst four peer reviewers, it took five rounds of peer review to revise the manuscript to be suitable for all.

The main challenge was the apparent incompatability of MLG, with its normative 'levels' of governance, and the flat ontology of practice theory. The inclusion of Nicolini's analysis of large scale phenomena in a major revision helped to navigate this problem, and the result is an empirical contribution which helps to pave the way for practice theory to be used to analyse complex, multi-sited bundles of practice.

Following publication, the use and adaptation of the three-element model in Paper 4 proved to be unpopular with Elizabeth Shove herself. In a presentation at a recent workshop, she criticised a number of articles which had 'modified', 'appropriated' or 'significantly misunderstood' the model (Shove, personal communication, 26/03/2018). Paper 4 in this thesis was listed under the latter category, and Shove insisted that it falsely reinstated hierarchy. She also said she did not recognise the contemporary debate on using practice theory to research large scale phenomena.

In addition to the extensive member checking process prior to journal submission, Paper 5 generated strong and opposing views from six peer reviewers. While several approved of efforts to make practice theory more practicable, others criticised the paper by questioning the desirability of engaging with policy making processes in their current form. An early draft had focused on addressing an audience of researchers who would be interested in bringing insights from practice theory to bear in the policy realm, while simultaneously acknowledging that there were scholars within the energy research community who may not share this goal. However, in response to two critical reviewers, the discussion section was revised to include a more detailed account of the reasons why policy engagement is not a ubiquitous objective. Nonetheless, one reviewer felt that this did not go far enough, and urged us to adopt a set of more radical arguments. They suggested that the rise of

'nudge', 'evidence-based policy', and the GSR profession itself could be seen as at least as radical as the calls made by practice theorists for comprehensive reform. They claimed that insights from behavioural economics not only produced minor changes to energy demand, but could 'make matters worse', by normalising excessive energy consuming practices. The strength of argument presented by this reviewer demonstrates that the interface between practice theory and policy is highly charged. The now-published paper aims for a more balanced line of argument than that made by the reviewer, based on evidence from interviews. Nonetheless, we anticipate this contribution stoking further debate.

The findings from the five papers suggest that for insights from practice theory to be better integrated into governance practices, a number of practical obstacles need to be overcome, and theoretical and methodological innovations made. For instance, pursuing accessibility and producing forms of 'admissible' evidence could help GSRs to become advocates of practice theory. However, vocal resistance to these efforts from some proponents of practice theory presents another obstacle to surmount.

In summary, some of the ways that theory has been used in this thesis have generated controversy and criticism. But debate and disagreement in academic research is no bad thing, and this indicates that the research question at the centre of this thesis is both pertinent and important. My experience of being criticised by Shove indicates that in hindsight, a more frictionless route would have been to use an alternative model such as the energy cultures framework, or Gram-Hanssen's humanist framework. There may have been more leeway for theoretical experimentation and governance applications using these, especially in light of explorative contributions from the lead authors themselves

(Stephenson et al., 2015; Stephenson, 2018; Gram-Hanssen, 2014). However, Shove and colleagues' work is better known, and some GSRs in Paper 5 indicated that it was thanks to this this that they had encountered practice theory at all. Perhaps it is the ardent criticism of current policy and governance practice, and the vehement defence of theoretical boundaries expressed by the Shovian school that has led to practice theory gaining relative prominence today. Future research trying to apply practice theory in the realm of policy and governance may benefit from this, but may find it more fruitful to use a more philosophically flexible heuristic than the three-element model.

9.2.2 A FUTURE RESEARCH AGENDA

The first part of this section discusses the need for further research on energy and environmental governance using practice theory and identifies areas in need of development. The second part suggests ways in which social scientific research could help to support the SME energy transition.

9.2.2.1 PRACTICE THEORY AND ENERGY AND ENVIRONMENTAL GOVERNANCE

Firstly, whereas practice theory has been used extensively in studies of energy demand in the household, this research has demonstrated its value for researching non-domestic settings, and in better understanding governance practices. There is a clear need for additional research in this vein. As demonstrated in Paper 4, contemporary models of multi-level governance offer rich empirical material for practice theorists concerned with energy transitions. In order to contribute to this important discourse, there is a need for

more research on large-scale phenomena, which is likely to require further theoretical experimentation of the sort explored in this paper.

Secondly, while practice theory has helped to show how energy demand and environmental impacts arise from everyday practices, there is a need to explore and expand on how it might contribute towards envisioning change for a lower carbon future. Researchers setting out with this goal could for example focus on specific, carbon intensive practices and investigate the potential for *changing* the materials, meanings and competences, such that energy and emissions savings result. The empirical settings used in this thesis offer potential for experimentation. For instance, research in partnership with an employing business could investigate the effects of changing elements of flexible working practices, for instance introducing hot-desking arrangements and downsized premises to fully realise the potential for energy savings when staff work from home. Understanding how changes to some elements impact on practices as a whole is an important objective if social scientific research is to inform business decision-making. Similarly, a practice-lens could be used to conduct a study alongside an infrastructure development project to investigate how practices change when its material elements are transformed. These could include the deployment of publicly available electric vehicle charging infrastructure, or urban bicycle highways.

Besides opportunities for empirical research to better understand how change occurs, there is a need for practice theorists to better articulate the nature of practice-inspired policy interventions. Paper 5 explained that GSRs struggled to understand how practice theory might be applied in their own work in central government, leading to the current situation where the contributions of practice theory to academia are acknowledged and respected,

but barely influential in the policy arena. While it is clear that the model for change embedded in practice-theoretical energy research is a radical one, there is a need for further research to explore how the gulf between research and policy practice might begin to be crossed. Flyvberg's (2001) call for a social science which articulates 'where we are, where we want to go, and what is desirable' is instructive: regardless of whether it is evolution or revolution in governance practice that is required, it is time for practice theorists to show their stripes.

Thirdly, there is a need to expand on recent efforts to use quantitative methods in practice-theoretical research with a view to achieving greater policy impact. These are limited in scale and have been met with resistance and debate (Higginson et al., 2015; Narasimhan et al., 2017). While these studies have sought to map elements and to model change, an alternative approach could be to firstly *quantify* and secondly *intervene* in daily activities and structural influences on behaviour, subsequently discussing these changes using insights from practice theory. For example, were the METER project, which gathers time-of-use data alongside household electricity consumption, to intervene in the schedule and opening hours of local primary schools, it could then monitor the associated changes in electricity demand and daily routines of families with children. If a significant sample of quantitative data based on such an intervention were to be analysed from a practice perspective, there is little doubt that policy professionals such as GSRs would take note.

9.2.2.2 FUTURE RESEARCH ON SMES AND THE ENVIRONMENT

There is an urgent need to accelerate the low carbon transition across OECD economies if the worst impacts of climate change are to be avoided. Collectively, SMEs emit

significant quantities of greenhouse gases, and are both under-researched and inadequately addressed by policy. This research has explored how their environmental performance might be improved through more effective governance at multiple levels.

Paper 3 calls for more 'people-centred' policy, and a new culture of environmental business support. While this may ostensibly be a message for policy-makers and brokers of low carbon advice, social scientists have an important role to play in understanding how change in organisational practices is achieved, and researching what values, languages, and messages might help to bring this about. The last three decades of academic literature on SMEs and their environmental impacts is sporadic and distributed across a variety of publications, using myriad theoretical and methodological approaches. Whilst its interdisciplinary nature is to be lauded, there is a need for more cohesion amongst the research community, which is variously spread across business schools, university departments and other research institutions. A more closely-knit community could better champion the subject area to an audience of research funders and policy-makers, working together to develop compelling, large scale research programmes. Pursuing these goals, I co-hosted a UKERC workshop on the topic of SMEs and energy research in 2018 which was well-attended by academics, policy-makers and representatives from the private sector.

One observation made throughout this thesis is that the SME category is both large and diverse, meaning that it is difficult to make generalisations. Based only on a threshold of size, defined by turnover and employee numbers, it includes over five million enterprises in the UK alone. Nonetheless, this category persists in policy discourse across the OECD, and the threshold is frequently used to define the bounds of particular policies, such as

Article 8 of the EU Energy Efficiency Directive, which uses the size cut-off to exempt SMEs from mandatory energy audits (European Commission, 2013). Despite the heterogeneity of SMEs, the business support policies examined in Papers 2, 3 and 4 include the full 5.7m in their scope. This means that low carbon advisors are tasked with providing support to enterprises ranging from home-based sole-traders, to long established, energy intensive industrial organisations with up to 250 employees. Open to requests for support from all SME types, it can be assumed that low carbon advisors do not find themselves assisting organisations where the potential for energy efficiency is greatest.

When developing energy and environmental policies for SMEs, it is therefore helpful to introduce a second dimension besides size. Options for segmenting the SME population have been discussed elsewhere, and include sub-categories of size (micro, small and medium), sector, location, business strategy, building type, building tenancy, data availability and energy-using practices (Janda et al., 2014; Anable et al., 2015; Hampton and Fawcett, 2017). A recent example of where an additional dimension has been used to segment the SME population is the Non-domestic Smart Meter Energy Management Innovation Competition (BEIS, 2017). This UK government initiative, which has funded a number of technologies and innovations focused on improving energy management in small and medium-sized organisations, has focused on three sectors it considers having most potential for impact: retail, hospitality and schools. The result is that the apps, dashboards and prompts that the projects are developing can be better targeted to the types of energy-using practices relevant for these sectors.

Practice theory offers some significant potential here. This thesis has discussed a number of practices which are common to a range of SMEs, including energy management,

commuting and working from home. Just as product efficiency standards have been successful in reducing energy consumption with little disruption to everyday practice (European Commission, 2009), the elements of these practices could be the target for intervention. Examples include training delivered alongside the installation of smart meters, or formalising into company policies the connection between working from home and energy conservation.

The dimensions listed above each has the potential to offer value to policy-makers beyond the single category of size. However, the availability of accurate, high resolution data at the national scale is variable, meaning that reliable segmentation is often not possible. Researchers and their funders have an important role to play in gathering evidence to support policy-makers to develop effective, targeted interventions.

9.2.3 IMPLICATIONS FOR SME GOVERNANCE

Findings from this research have implications for the governance of the SME low carbon transition. It has put a spotlight on the disordered landscape of governance practices affecting SMEs. For instance, Paper 3 found geographical inconsistency in the implementation of publicly funded low carbon advisory services, and highlighted tensions when integrating this support into the economic growth agenda. Paper 4 zoomed in on a single programme, finding that low carbon objectives were hampered by bureaucratic risk management, insufficient skills, and misplaced discretion.

Further, it has highlighted a lack of clarity at the national level regarding the oversight of energy and environmental governance for SMEs. Papers 2, 3 and 4 each investigate forms of regional governance which are overseen by the Ministry for Housing, Communities and

Local Government (MHCLG, previously DCLG). Findings suggest that within this ministry, there is little familiarity with energy and environmental issues and associated policies, and this may have contributed to emissions reductions being deprioritised for Sustainable Routes. Additionally, the translation of ERDF rules into the operational programme for England has been poorly implemented, with the result being inconsistency in audit approaches and excessive administrative requirements placed on sub-regional projects. By contrast, Paper 5 offers the perspectives of GSRs working on energy and climate at the national level, and its sample of participants is taken exclusively from BEIS and the Department for Transport - not MHCLG. This reveals a mismatch between those developing strategies for meeting climate change targets at the national level, and those overseeing the implementation of energy and environmental policy for SMEs at the regional and local levels.

These limitations of contemporary governance arrangements are doubtlessly worrying. However, it was not the primary objective of this research to reveal the inadequacies of extant governance practice – indeed it is assumed in the research question that there is scope for improvement. So, what does this mean for efforts to use practice theory to help matters? Integrating social scientific insights into policy discourse and practice is already an ambitious project. When the landscape of governance institutions, actors and practices is so disparate and changeable, selecting target audiences and developing pathways to impact become all the more challenging for researchers.

In recent months the issue of departmental jurisdiction at the national level has started to be addressed. Beginning with the merger of DECC and the department for Business, Innovation and Skills (BIS) to create BEIS in 2016, those civil servants working on energy

and climate have become increasingly involved with SME governance. A 'Local Energy Team' has recently been created within the department. This has funded all LEPs in England to develop an energy strategy, and created regional energy hubs which are due to coordinate action across LEP areas. Within BEIS, this team has the potential to bridge the gap between national policy development and local implementation, establishing links on the one hand with GSRs and their far-reaching perspectives, and on the other, with LEPs and individual projects.

Much of this research has focused on governance practices which are either fully funded, or supported by, the European Union. Without the ERDF, which funds the majority of incentives such as grants and face-to-face advice for SMEs, there would be a significant gap in governance, with implications for UK climate change targets overall. With the UK set to leave the EU in early 2019, there is major uncertainty in this policy area. The government has indicated that a 'Shared Prosperity Fund' will be created, but is yet to provide any detail on how this will be distributed or administered (Local Government Association, 2017).

Assuming that the UK government wishes to continue funding incentive-based energy and environmental policies for SMEs, then the design and delivery of the Shared Prosperity Fund presents an opportunity for improvement. The findings in this thesis have indicated that recruiting SMEs to support programmes is far from easy, with many advisors finding that they must proactively 'sell' their services and grant offers to SMEs. This is made easier when existing networks such as Growth Hubs and larger programmes of business support can be used for cross-promotion. However, shortcomings have been identified when low carbon objectives are integrated with the provision of conventional business support,

focused on business growth and job creation. One potential way through this quandary would be to establish a national brand and governance framework for environmental business support. While this could be tailored to, and implemented at, the local level, fewer resources would be required to produce marketing materials and raise awareness. Local advisors could then focus their efforts on providing expert advice, ranging from the technical to the personal.

A national brand for advice and a consistent offer of financial support would also make it easier for other middle actors such as energy brokers or accountants to act as intermediaries. A successful example of this approach is the grant made available by the Office for Low Emission Vehicles (OLEV) to subsidise the purchase of new plug-in vehicles (OLEV, 2018). The grant is actively promoted by vehicle sales-people around the UK, meaning that OLEV itself can operate with very few staff and overheads (personal communication with OLEV officer, 2018).

This thesis has highlighted the important role played by low carbon advisors in the SME energy transition and has called on them to be more creative and ambitious in their practice. If this is to be achieved, then this community of practitioners needs to be given adequate support. Working together under a national programme would help them to gain the recognition they deserve, and could be used to create a structured professional development framework whereby advisors could be encouraged and supported to engage SMEs in conversations about the 'softer stuff'. The 'Growing Greener' project aims to contribute to these efforts. Drawing insights from this thesis, and on work by the charity Climate Outreach, the project is creating an Open Educational Resource targeted at low carbon advisors and other middle actors (Open University, 2018). Responding to the call

for more engagement with personal, professional and organisational values made in Paper 3, the online course uses the Schwartz Values System as a theoretical framework (Schwartz, 2012), and includes exercises and suggestions for applying values in advisory work with SMEs. In addition to developing the tact and sensitivity required to engage with SME values, a national programme and a more established professional standing might give advisors the confidence to be more *challenging* when they meet with SMEs. For instance, asking open questions relating to an SME's foundational principles and its long term legacy can help to shift the conversation on to questions of ethics and responsibility (Open University, 2018).

While it is likely that incentive-based approaches will dominate the SME environmental policy agenda for some time to come, the scale and speed of the transition required to avert climate catastrophe requires more bold and ambitious approaches in the coming years. The ways in which the SME population is framed in cultural and political narratives is key to what may be possible for policy-makers and middle actors. The scale and heterogeneity of the SME population means that they can be understood and envisioned in multiple ways. On the one hand, SMEs are often referred to as the 'backbone of the economy' (Dowden, 2018), whereas on the other hand they are protected from hard-lever policies as if they are fragile and passive. Metaphors of strength and resilience may help to raise public expectations of SMEs, and pave the way for more demanding policies. Another common and potentially fruitful narrative is that SMEs are the disruptors, innovators and change-makers that are leading the way to a lower-carbon future (Energy Systems Catapult, 2017). The relatively recent notion of the 'start-up' conjures images of modern workplaces with indoor putting-greens and swings (Workspace Design & Build,

2016), radical working practices, and - perhaps most crucially - explicitly stated, extrinsically focused values (Kulturenvy, 2013). These alternative ways of doing business are becoming increasingly popular amongst entrepreneurs, job-seekers and consumers, and may lead to more proactive approaches to environmental responsibility taken by SMEs. Academics, middle actors and policy professionals each have a role to play in shaping these narrative framings of SMEs.

9.3 CONCLUSIONS AND CHAPTER SUMMARY

This research has demonstrated how practice theory can be used to generate insights with the potential to make the governance of the SME low carbon transition more effective. This chapter summarised how each empirical paper contributed to this demonstration, and provided some meta-conclusions relating to success-factors, impact-pathways, and the experimental use of theory.

Collectively, SMEs consume significant quantities of energy, have a major environmental impact, and there is untapped mitigation potential. It is hoped that this thesis will draw attention to the importance of fully including SMEs in efforts to tackle climate change. The choice of DPhil by publication reflects this ambition, and there is evidence of the papers having impact on governance practice already.

This research has spanned a wide range of scales, settings and practices and used a variety of theoretical approaches in combination with practice theory. There are parallels here with the diversiform nature of the SME energy transition itself, which will need to involve a multitude of actors, approaches, and practices at different scales. While physical, technical and economic approaches continue to dominate policy discourse, this

research has shown that there is both a need and potential for social science to make more meaningful contributions to energy and environmental governance. Practice theory, with its focus on practices as the principal unit of research, has the potential to cut through the heterogeneity of the challenge.

9.4 REFERENCES

Anable, J., Darnton, A., Pangbourne, K., Lane, B., Banks, N., Henry, N., 2015. Evidence Base Review of Business Travel Behaviour to Inform Development of a Segmentation of Businesses. Department For Transport.

Aykol, B., Leonidou, L.C., 2015. Researching the Green Practices of Smaller Service Firms: A Theoretical, Methodological, and Empirical Assessment. J. Small Bus. Manag. 53, 1264–1288. https://doi.org/10.1111/jsbm.12118

BEIS, 2017. Non-domestic smart energy management innovation competition information day.

Dowden, O., 2018. "Small businesses are the backbone of our economy." GOV.UK.

Energy Systems Catapult, 2017. #CollectiveFuture Insights: Helping SMEs to access the energy industry.

European Commission, 2009. Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (Text with EEA relevance).

European Commission, 2013. Guidance note on Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EC, and repealing Directives 2004/8/EC and 2006/32/EC Article 8: Energy audits and energy management systems.

Feldman, M.S., Orlikowski, W.J., 2011. Theorizing Practice and Practicing Theory. Organ. Sci. 22, 1240–1253. https://doi.org/10.1287/orsc.1100.0612

Flyvbjerg, B., 2001. Making social science matter: why social inquiry fails and how it can succeed again. Cambridge : Cambridge University Press, Cambridge.

Gram-Hanssen, K., 2014. New needs for better understanding of household's energy consumption – behaviour, lifestyle or practices? Archit. Eng. Des. Manag. 10, 91–107. https://doi.org/10.1080/17452007.2013.837251

Gram-Hanssen, K., 2010. Standby consumption in households analyzed with a practice theory approach. J. Ind. Ecol. 14, 150–165. https://doi.org/10.1111/j.1530-9290.2009.00194.x

Hampton, S., Fawcett, T., 2017. Challenges of designing and delivering effective SME energy policy, in: ECEEE Summer Study Proceedings. Presented at the ECEEE, France.

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., Thomson, M., 2015. Diagramming social practice theory: an interdisciplinary experiment exploring practices as networks. Indoor Built Environ. 24, 950–969. https://doi.org/10.1177/1420326X15603439

Janda, K., Wilson, C., Moezzi, M., Bartiaux, F., 2015. Improving efficiency in buildings: conventional and alternative approaches, in: Ekins, P., Bradshaw, M., Watson, J. (Eds.), Global Energy: Issues, Potentials and Policy Implications. Oxford University Press, Oxford, pp. 163–188.

Janda, K.B., Bottrill, C., Layberry, R., 2014. Learning from the "data poor": Energy management in understudied organizations. J. Prop. Invest. Finance 32, 424–442.

Keller, M., Halkier, B., Wilska, T.-A., 2016. Policy and Governance for Sustainable Consumption at the Crossroads of Theories and Concepts. Environ. Policy Gov. 26, 75–88. https://doi.org/10.1002/eet.1702

Kuijer, L., 2014. A call for more practice theory on the future, in: Demanding Ideas: Where Theories of Practice Might Go Next. Windermere.

Kulturenvy, C.M., 2013. How Do You Define Startup Culture? Wired. https://www.wired.com/insights/2013/09/how-do-you-define-startup-culture/

Local Government Association, 2017. Beyond Brexit: Future of funding currently sourced from the EU (Discussion document). London.

Lutzenhiser, L., 2014. Through the energy efficiency looking glass. Energy Res. Soc. Sci. 1, 141–151. https://doi.org/10.1016/j.erss.2014.03.011

Narasimhan, K., Roberts, T., Xenitidou, M., Gilbert, N., 2017. Using ABM to Clarify and Refine Social Practice Theory, in: Advances in Social Simulation 2015, Advances in Intelligent Systems and Computing. Springer, Cham, pp. 307–319. https://doi.org/10.1007/978-3-319-47253-9_27

Nicolini, D., 2012. Practice Theory, Work, and Organization: An Introduction. Oxford University Press.

OLEV, 2018. Reformed Plug-In Car Grant extended into next decade. GOV.UK.

Open University, 2018. Growing Greener: Creating a new values based environmental engagement toolkit for SME intermediaries [WWW Document]. GOV.UK. URL http://business-school.open.ac.uk/research/growing-greener (accessed 1.9.19).

Sahakian, M., Wilhite, H., 2014. Making practice theory practicable: Towards more sustainable forms of consumption. J. Consum. Cult. 14, 25–44. https://doi.org/10.1177/1469540513505607

Schmidt, R., 2016. The methodological challenges of practising praxeology, in: Spaargaren, G., Weenink, D., Lamers, M. (Eds.), Practice Theory and Research: Exploring the Dynamics of Social Life. Routledge, pp. 43–59.

Schwartz, S., 2012. An Overview of the Schwartz Theory of Basic Values. Online Read. Psychol. Cult. 2. https://doi.org/10.9707/2307-0919.1116

Shove, E., 2011. On the Difference between Chalk and Cheese—A Response to Whitmarsh et al's Comments on "beyond the ABC: Climate Change Policy and

Theories of Social Change." Environ. Plan. A 43, 262–264. https://doi.org/10.1068/a43484

Shove, E., 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. Environ. Plan. A 42, 1273–1285. https://doi.org/10.1068/a42282

Shove, E., Pantzar, M., 2005. Consumers, producers and practices: understanding the invention and reinvention of Nordic walking. J. Consum. Cult. 5, 43–64. https://doi.org/10.1177/1469540505049846

Shove, E., Pantzar, M., Watson, M., 2012. The Dynamics of Social Practice. SAGE Publications.

Shove, E., Walker, G., 2014. What is energy For? Social practice and energy demand. Theory Cult. Soc. 31, 41–58. https://doi.org/10.1177/0263276414536746

Spaargaren, G., Weenink, D., Lamers, M., 2016. Practice Theory and Research: Exploring the dynamics of social life. Routledge.

Stephenson, J., 2018. Sustainability cultures and energy research: An actor-centred interpretation of cultural theory. Energy Res. Soc. Sci. 44, 242–249. https://doi.org/10.1016/j.erss.2018.05.034

Stephenson, J., Barton, B., Carrington, G., Gnoth, D., Lawson, R., Thorsnes, P., 2010. Energy cultures: A framework for understanding energy behaviours. Socio-Econ. Transit. Hydrog. Econ. - Find. Eur. Res. Regul. Pap. 38, 6120–6129. https://doi.org/10.1016/j.enpol.2010.05.069

Stephenson, J., Hopkins, D., Doering, A., 2015. Conceptualizing transport transitions: Energy Cultures as an organizing framework. Wiley Interdiscip. Rev. Energy Environ. 4, 354–364. https://doi.org/10.1002/wene.149

Walton, S., 2015. Energy Behaviour of SMEs in New Zealand. Centre for Sustainability, Otago University.

Warde, A., 2005. Consumption and theories of practice. J. Consum. Cult. 5, 131–153.

Whitmarsh, L., O'Neill, S., Lorenzoni, I., 2011. Climate Change or Social Change? Debate within, amongst, and beyond Disciplines. Environ. Plan. A 43, 258–261. https://doi.org/10.1068/a43359

Wilson, C., Chatterton, T., 2011. Multiple Models to Inform Climate Change Policy: A Pragmatic Response to the 'Beyond the ABC' Debate. Environ. Plan. A 43, 2781–2787. https://doi.org/10.1068/a44404

Wilson, C., Janda, K., Bartiaux, F., Moezzi, M., 2015. Technical, economic, social and cultural perspectives on energy demand, in: Ekins, P., Bradshaw, M., Watson, J. (Eds.), Global Energy: Issues, Potentials and Policy Implications. pp. 125–147.

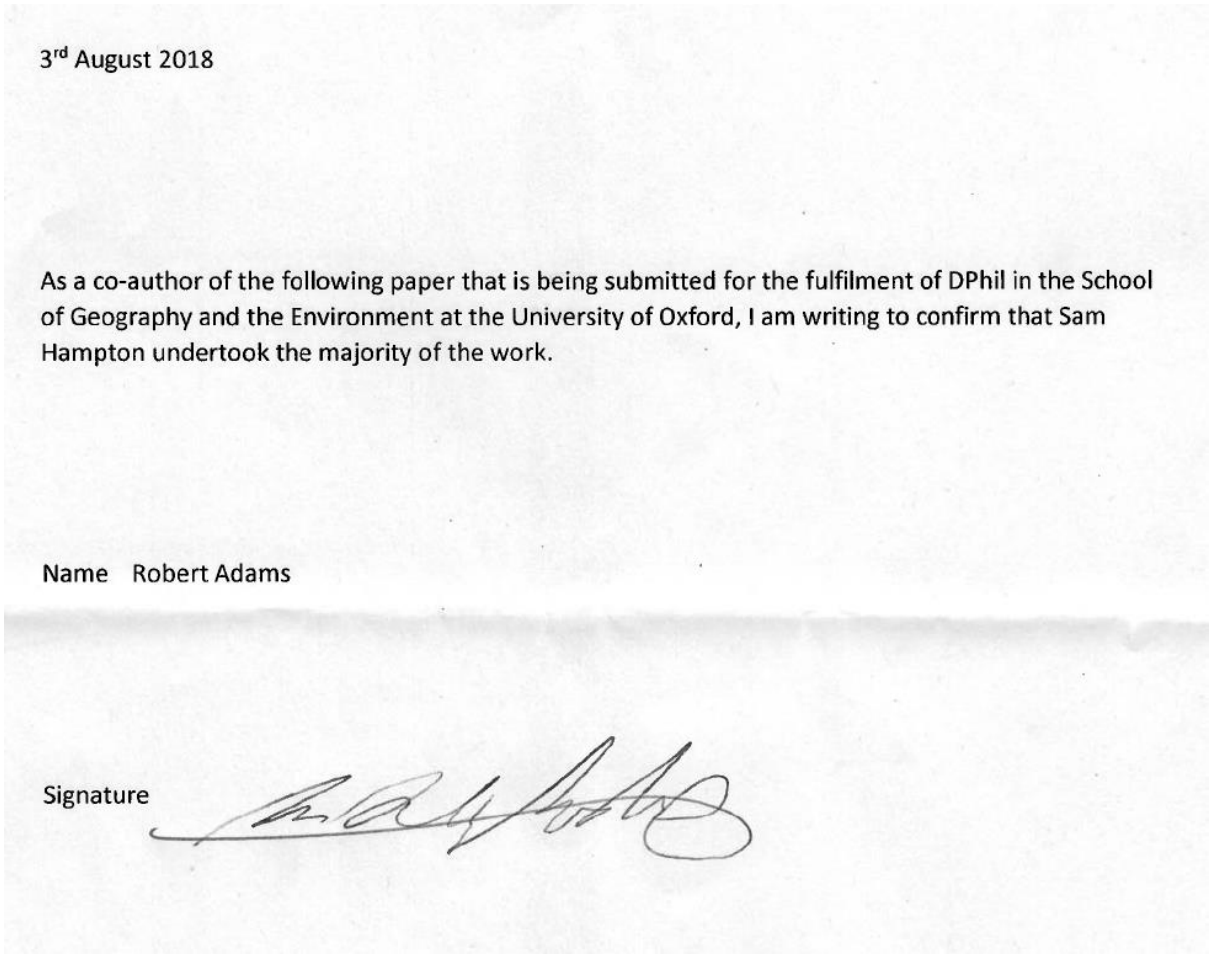
Workspace Design & Build, 2016. What can we learn from Google's offices about workplace design? Work. Des. Build.

APPENDIX A – CO-AUTHOR STATEMENT

Paper 5 of this thesis, entitled 'Behavioural economics vs social practice theory: Perspectives from inside the United Kingdom government', was co-authored with Rob Adams.

I conducted the majority of the work, including the interviews and all of the writing. Rob contributed insights as a researcher within government, provided comments on various drafts, and assisted through the member-checking process.

Rob has provided a declaration (below) which states that I, Sam Hampton, contributed the majority of the work on this project.



3rd August 2018

As a co-author of the following paper that is being submitted for the fulfilment of DPhil in the School of Geography and the Environment at the University of Oxford, I am writing to confirm that Sam Hampton undertook the majority of the work.

Name Robert Adams

Signature