The Practice of Energy Efficiency Consulting for Commercial Buildings: An Analysis

Through the UK Energy Savings Opportunities Scheme

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Abstract

The UK recently adopted the Energy Savings Opportunities Scheme (ESOS), requiring large businesses to conduct an energy audit of its buildings and identify opportunities for energy efficiency. This policy requires external consultants to conduct or review the audit. Using ESOS as a platform, this thesis examines concrete elements of the consulting practice, and explores how they may influence the adoption of energy efficiency measures in UK commercial buildings. Based on sixteen semi-structured interviews with ESOS consultants, this thesis offers numerous insights into the on-the-ground practice of energy efficiency consulting, addressing a much-deserved academic and professional gap. This thesis finds that, as opposed to elements of the consulting practice, pre-existing factors influencing businesses' approach to energy efficiency are most important in driving businesses to adopt measures identified through the ESOS audit. This raises questions to policymakers and practitioners about the overall impact of energy efficiency consulting and mandatory energy audit policies on the uptake of energy efficiency in commercial buildings. On the other hand, this thesis introduced an innovative conceptual framework that combines prominent concepts of management consulting and existing sociological insights on energy use in commercial organisations, which offers an enriched and unprecedented practice-based view of energy efficiency consulting.

Chapter 1: Introduction

   "Energy efficiency is a way of managing and restraining the growth in energy consumption. Something is more energy efficient if it delivers more services for the same energy input, or the same services for less energy input. For example, when a compact florescent light (CFL) bulb uses less energy (one-third to one-fifth) than an incandescent bulb to produce the same amount of light, the CFL is considered to be more energy efficient" (International Energy Agency 2016).

Along with renewable energy, energy efficiency is one of the "twin pillars of sustainable energy" that helps to reduce greenhouse gas emissions (Prindle et al. 2007). In the UK, the pursuit of energy efficiency is necessary in order to reach the statutory 2050 emissions reduction target (Cohen and Bordass 2015, p.3). Indeed, energy efficiency is a key means to address climate change and resource constraints, garnering the attention of planners and academics alike (Eames et al. 2014, p.1). Accounting for about half of the UK building stock, commercial buildings produce significant energy use but have not displayed enough efforts to scale up energy efficiency (Axon et al. 2012, p.462; Dixon et al. 2014). A study has shown that UK businesses disregard approximately £1.6 billion of potential savings from energy efficiency (Dixon 2014, p.444).

Currently, a few UK governmental policies aim to induce businesses to act on energy efficiency. In 2015, the government introduced the Energy Savings Opportunity Scheme (ESOS)—transposed from EU's Energy Efficiency Directive (2012/27/EU), which requires large UK businesses to conduct a comprehensive energy audit for "their buildings, industrial processes and transport to identify cost-effective energy saving measures" every four years (Department of Energy and Climate Change (DECC) and Environment Agency 2016, para.3). ESOS is a reporting policy that only requires an energy audit, but hopes that businesses would act on the identified energy saving recommendations. ESOS is the UK's most comprehensive energy efficiency policy to date, designed to capture many businesses that had never been subject to any energy efficiency regulation. In addition, ESOS pushes for higher-quality audits—such as adhering to the international standard ISO50001—compared to previous policies (see Section 2.3.1).

An important actor in the implementation of ESOS is the auditor—the *ESOS lead assessor*. The lead assessors either carry out the entire audit or they sign off on an existing audit, but ultimately they are responsible for making sure the business has an audit that complies with ESOS standards. Through completing the audit, these lead assessors act in a consultative capacity to induce businesses to adopt the energy efficiency improvements identified from the audit. Therefore, while businesses' approach to energy efficiency is contingent on a plethora of factors, it also depends heavily on the involvement of these lead assessors. Consequently, the consulting process between these lead assessors and their commercial clients merits further investigation. In particular, how does a mandatory energy audit lead to a business' eventual decision to act on identified recommendations? And how do lead assessors act in this consulting process?

Research Problem

Recently, practitioners, academics and policy-makers have given more effort to understand how businesses behave towards energy efficiency (Behavior, Energy & Climate Change 2015). Whether they focus on individual occupants within commercial buildings or organisational dynamics, Andrew and Johnson (2015)'s review of these studies reveals that they rarely consider the consultants as an integral part of this social world (see Section 2.3). Consequently, there is a noticeable lack of academic attention to the practice of energy efficiency consulting, in which consultants interact with client organisations to identify potential energy efficiency measures and—hopefully—implement them.

Using ESOS as a platform, this thesis views energy efficiency consulting as a social practice, and explores how concrete elements of the consulting practice influence the adoption of energy efficiency measures in UK commercial buildings. The *consultants* in question are the ESOS lead assessors; and the *client organisations* are large UK businesses that have completed an audit and thus have complied with ESOS. The data are collected from semi-structured interviews with ESOS lead assessors regarding their experience with ESOS audits, interactions with client organisations, and broader notions

of energy efficiency consulting (see Section 3.2.1). The research is broken down into several questions:

Question 1. What are the factors that influence the energy efficiency of buildings of the client organisations, as identified and interpreted by consultants in the energy audits?

Question 2. How do consultants cope with these factors throughout the consulting process? In other words, what are the elements—such as doings, sayings and motivations—embedded in each stage of the consulting process?

Question 3. How do elements of energy efficiency consulting lead to the businesses' uptake of energy efficiency measures post-audit?

Question 4. How do the more intangible elements of the consulting practice—such as consultants' general comments on energy efficiency policies—reveal the consultants' ideal form of energy efficiency consulting?

This thesis borrows McDonough (2006) operationalisation of the *theory of practice* as the overall analytical lens. Under this view, **Questions 1-3** directly address the tangible *practical practice* of energy efficiency consulting through the ESOS experience. On the other hand, **Question 4** addresses the more *embodied* and *defence practice*, which are equally important in the understanding of energy efficiency consulting.

To illustrate the complexities of factors in **Question 1**, I borrow from Janda (2014)'s latest conceptual framework that categorises the businesses' *concerns, capacities* and *conditions* regarding energy efficiency into three levels: the organisational level, the individual level, as well as nuanced interactions between the two levels. To ease the task of characterising dynamic elements of the consulting practice in **Question 2**, I draw from established consulting concepts in the management literature, particularly the *expert, doctor, process models* and the types of clients from Schein (1990; 1997), and the consultant roles outlined by Lippitt and Lippitt (1986). **Question 3** will be explored through the same framework from Question 1 and 2. The resulting conceptual framework based on these existing bodies of literature will render the analysis of the consulting

practice more enriched and relevant to contemporary discourse in energy efficiency (see Section 2.4).

Academic and Societal Relevance

Through this research, I aim to address a knowledge gap in both the academic and professional literature on energy efficiency. Firstly, this thesis gives much deserved attention to energy efficiency in commercial buildings, both academically and professionally (Andrews and Johnson 2015). In terms of its societal relevance, understanding how energy efficiency consulting factors into businesses' energy behaviours has significant implications for closing the energy efficiency gap: offering insights for policymakers, consultants and businesses. Moreover, the empirical results should inform advocates of the urban retrofit transition on the current progress of retrofitting in the commercial building stock (Eames et al. 2014). More practically, this thesis would be one of the first studies to examine the first round of ESOS implementation. The ESOS lead assessors' personal accounts of their ESOS audits brings forth some critical on-the-ground information about the most recent and important legislation on energy efficiency for businesses.

In terms of its academic contribution, this thesis directly addresses the literature gap about the nature of the consulting practice in relation to successful outcomes of energy efficiency. It presents an innovative analytical framework that combines key concepts from several relevant bodies of literature, which enables a comprehensive analysis of the research problem. Last but not least, through using *practice theory* to examine energy efficiency consulting, this thesis offers a look into the practitioners' own elements and ideal vision of the practice, which future research could either benchmark against or further develop. Additionally, the thesis contributes to the empirical application of practice theory, which advances its relevance in the understanding of the social world.

Chapter 2: Literature Review

This chapter reviews all the relevant bodies of literature that contribute to the understanding of energy efficiency consulting as a practice. Firstly, this thesis defines what it means by the *practice* of energy efficiency consulting—and its associated *elements*—through a review of the *theory of practice* and its empirical applications. Then, it explains how it uses a particular operationalisation of practice theory as the foundation of its conceptual framework (McDonough 2006).

As energy efficiency consulting begins with an audit of the client business' building energy usage, the next body of literature introduces the factors that shape the audit results. A typology will be developed to encompass factors influencing the building occupants as well as those that influence businesses at the organisational level. The typology will be utilised to assess how ESOS lead assessors are aware of these factors, and to what extent they actively engage with them in the consulting practice.

The next body of literature concerns the consulting process itself. Compared to management consulting, energy efficiency consulting is often catalysed by businesses' need to comply with standards and legislations. As a result, the consulting practice already embodies certain fixed elements: an energy audit that conforms to the necessary standards, and the subsequent list of concrete energy efficiency recommendations. Nevertheless, much of the management consulting practice also applies to energy efficiency consulting. The consultant may interact with various individuals with different motivations and expectations; and the corresponding roles that the consultant adopts could range from passive to active, for example. Therefore, some prominent models and concepts from the management consulting literature will supplement the analysis of the energy efficiency consulting practice.

Last but not least, a conceptual framework will be developed by incorporating the most relevant concepts from the literature review to answer the research questions.

2.1 Theory of Practice

Broadly speaking, this thesis uses the *theory of practice* to examine energy efficiency consulting as the centre of the social world occupied by ESOS lead assessors and client organisations. With this view, elements of the practice are the primary focus of analysis while the ESOS lead assessors are the carriers of the practice (Shove et al. 2012, p.5). Among various empirical applications of practice theory, scholars have examined different professions—including nursing, mentoring and public service (Carmel 2005; Kemmis 2014; McDonough 2006). They argue that only through examining the actual elements of the practice as carried out on the ground could an accurate understanding of the profession be formed (Carmel 2005). Moreover, this understanding could verify whether notions of the practice—as prescribed by policymakers and other actors in the industry—are actually upheld by the consultants in reality (Carmel 2005; McDonough 2006).

2.1.1 Theory

The theory of practice is a social theory that has been advanced by Bourdieu, Giddens and other prominent theorists, who are interested in viewing the everyday practices with an interpretive and cultural perspective of social theory (Reckwitz 2002, p.244). In other words, the theory of practice asserts that the social world is located in the practice, "a routinized type of behaviour which consists of several [*elements*], interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge" (Ibid., p.249). A fundamental aspect of the practice view is the reconciliation between agency and structure: "human activity, and the social structures which shape it are recursively related" (Shove 2012, p.3). Two important concepts were introduced by Bourdieu to illustrate this reconciliation. *Habitus* is a system of "dispositions embodied as a result of personal experiences, backgrounds, professions and circumstances and is manifested as the interplay between" structure and agency (Petit-dit-Dariel et al. 2014, p.1369). *Field* is the broader "structural context of action … such as the family or the state" (McDonough 2006, p.633).

Applying these concepts to energy efficiency consulting, this thesis views the *energy efficiency consulting habitus* as both a structure that sits within the broad *field* of the *state* (since ESOS consulting exists as a result of a state intervention), and a "structuring structure" that shapes the *practice* of energy efficiency consulting (Bourdieu 1990 as cited by McDonough 2006, p.634). All in all, this thesis studies all of the *elements* that constitute the *practice* of energy efficiency consulting, while bearing in mind the interactions between the *habitus* and the *field*.

For this thesis, taking a practice lens to explore energy efficiency consulting has multifold purposes. Firstly, only by examining the embedded elements and ever-evolving routines of practitioners can one truly understand the practice of energy efficiency consulting (Carmel). Indeed, many studies of consulting have taken a "practice turn" (Pozzebon and Pinsonneault 2012, p.39; Johnson et al. 2007; Simpson 2009). Moreover, this understanding of energy efficiency consulting offers the empirical evidence against which the existing rhetoric of 'how consultants ought to behave' could be evaluated. This would help close the language gap between policy-makers, consultants and businesses (Lutzenhiser 2014, p.148). Thirdly, the normative notion of energy efficiency can be explored through its manifestations in the consulting practice (McDonough 2006).

2.1.2 An Empirical Analytical Framework

To social scientists, Lutzenhiser explains that energy efficiency consulting has a technical aspect and "a normative ring to it" (Lutzenhiser 2014, p.142). Fortunately, using the theory of practice means that this thesis can delve right into the practice itself. There are several ways of operationalising practice theory in empirical studies. In Carmel (2005)'s study of nursing, he focuses on examining elements of nursing that contradict the general perceptions of nursing from the state and academic *field*. In Kemmis et al. (2014)'s studying of mentoring, they developed *practice architectures*: the specific "material-economic, social-political and cultural-discursive arrangements" that render the mentoring practice possible (p.154). They analysed these arrangements by asking teachers to genuinely answer the question "what are you doing?" (Ibid,. p.155). Then, they empirically developed three types of mentoring. However, they explicitly broke

away from the *habitus* and *field* analogies to focus on what is 'on site,' which limits the study's implications on the broader structural contexts of mentoring.

In her study of public service, McDonough (2006) remedies Kemmis et al. (2014)'s weakness using three sub-concepts: *practical practice*, *embodied practice* and *defence practice*. These concepts can be explained in the context of energy efficiency consulting. *Practical practice* consists of the elements directly undertaken by consultants in the consulting process, including activities, framings of energy efficiency, consulting strategies and roles, interactions with clients, etc. The *embodied practice* consists of the more intangible things expressed by consultants as part of the consulting practice. These could be deeper rationale embodied in the habitus of energy efficiency consulting. Lastly, *defence practice* is revealed from consultants' statements that seek to defend their ideal vision for energy efficiency consulting. For example, the consultants' comments on the ESOS policy may indicate their *defence practice* vis-à-vis the government's prescribed functions of energy efficiency consulting. The advantage of McDonough (2006)'s operationalisation of practice theory is that it uses the narratives and daily practices of consultants to explore the complex dynamics of the habitus and field struggles of energy efficiency consulting.

This thesis adopts McDonough (2006)'s framework as the foundation of its conceptual framework to address the research questions: the *practical practice* is addressed in Questions 1 to 3, and the *embodied* and *defence practice* in Question 4.

2.2   Energy Efficiency in Businesses

Energy efficiency is often treated as a rational technical fix to problems such as energy shortage and rising energy prices (Lutzenhiser 2014; Janda 2012). In this physical-technical-economic model (PTEM)—a term coined by sociologist Lutzenhiser, switching to an energy efficient product only involves the device and its associated monetised costs and benefits (2014, p.143). PTEM disregards the fact that the use of energy intrinsically involves human beings in social systems; and policies based on PTEM inevitably reveal a shortfall known as the *energy efficiency gap*—failures to adopt energy efficiency measures even when they are cost-effective (DECC 2012, p.17; Dixon et al. 2014). This

shortfall begs the question: how does the *social* matter into the adoption of energy efficiency measures? Recently, there have been on-going efforts to reorient the research agenda of energy efficiency from the PTEM to a more social perspective, using socio-technical systems and organisational sociology (Lutzenhiser 2014, p.142). These efforts convey a pressing need to notice the deeper social and organisational dynamics that take place in energy use of commercial buildings. The following sections review factors found from existing studies as well as typologies used to characterise them.

2.2.1 Factors in the Adoption of Energy Efficiency Measures

In this nascent research field, there is a fairly developed body of work for domestic energy users (Stern 2008). On the other hand, studies into energy efficiency for commercial users are comparatively sparse (Andrews and Johnson 2015). Nevertheless, these existing studies of businesses have already challenged the PTEM framework by demonstrating that contrary to neoclassical microeconomics and rational choice theory, profit-maximising calculations are not the only factor that impact companies' investments in energy efficiency. There is a plethora of factors at stake (Borck and Coglianese 2011; Britnell and Dixon 2011; Annunziata et al. 2014).

In terms of the *structural* traits of the organisation, "[energy-efficient] adaptations more commonly appear in [privately owned,] newer, larger, more energy intensive and owner-occupied buildings" (Morrissey et al. 2014, p.398). The legal factor is significant in tenanted buildings: if tenants pay for energy use, landlords are not held responsible for energy efficiency (DECC 2012, p.21). But tenants cannot make significant retrofits either. Borck and Coglianese (2011) also concluded that larger organisations are more capable of energy efficient practices. However, Janda et al. (2014, p.428) noticed that there is a lack of capacity to address energy efficiency "even amongst self-defined major energy users." Perhaps energy intensity provides a more nuanced understanding: if a business' energy use accounts for a large portion of overall production costs, then energy efficiency measures are naturally prioritised higher in the business' agenda.

On the other hand, despite the lower salience of energy use, some low energy-intensive sectors find *strategic* reasons to adopt energy efficiency measures. For example, in the

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banking and finance sectors, improving energy efficiency of office buildings leads to higher comfort for the staff, which improves staff productivity and retention (DECC 2012, p.9). More externally, Borck and Coglianese (2011), Janda et al. (2014, p.428), and Martin et al. (2012, p.208) all found external social pressures or corporate social responsibility as a driver for energy efficiency practices. In the UK, however, businesses "continue to fail to recognise the strategic value of energy efficiency," which implies that other barriers exist (Dixon et al. 2014).

Even after taking into account of the aforementioned factors, Janda et al. (2014, p.425) still found a diversity of energy management practices in companies in terms of the presence of an in-house energy manager, the availability of metered energy data, etc. These discrepancies could be attributed to *organisational* and *managerial* factors such as the company's internal culture and the manager' personal view on environmental issues (Borck and Coglianese 2011). This emphasis on perceptions of key decision-makers and diverse priorities of stakeholders is strongly corroborated by Morrissey et al. (2014, pp.399-400; Britnell and Dixon 2011, p.3). Both Borck and Coglianese (2011) and Morrissey et al. (2014, p.408) found that "greater support from top-level management" is important. However, Martin et al. (2012, p.208) points out that top management (the CEO) should not be directly in charge of energy management. Instead, support from CEO is most effective if there exists an in-house energy manager who "is close to the CEO" (Ibid; Janda et al. 2014, p.428). In other words, internal dynamics such as the relationship between top management and those responsible for energy management—along with communication between different departments and building facilities—is also a factor in adoption of energy efficiency measures (Dixon et al. 2014).

2.2.2 A Framework to Characterise Factors

While a variety of factors exist, they are often studied in isolation of one another. And it is difficult to observe the dynamic interactions of these factors. For example, instead of merely emphasizing the attitudes of the CEO, one could look deeper into the contexts in which these attitudes are formed. Therefore, the study of energy use in businesses requires a more holistic examination that goes beyond the mere dichotomy of factors into

enablers versus *barriers* to illustrate the interplay between different factors (Guy and Shove 2000; DeCanio 1993).

In 2002, a group of scholars came up with a framework to study factors shaping businesses' approaches to energy efficiency (Janda et al. 2002). The "3C" framework has three broad types of factors: "(1) concern about energy problems; (2) operational conditions; and (3) institutional capacity for action" (Ibid, p.117). To simplify their analysis, the categories are presented as binaries: for example, a business either has *concern* for energy efficiency or it does not. Then, they classified businesses into groups based on possible combinations of *concern, conditions,* and *capacity*, and presented some policy recommendations that tailor to the particular group of businesses. The figure below illustrates the results of their study.

Concern concern about energy	Conditions opportunities for conservation	Capacity ability to act on opportunities	Policy approach to increasing energy efficiency (EE)
Yes	Yes	Yes	Recognize/encourage EE
Yes	No	Yes	Recognize past EE, create future opportunities
Yes	Yes	No	Technical assistance, incentives, peer support, education
Yes	No	No	Technical assistance, incentives, peer support, education, create future opportunities
No	Yes	Yes	Incentives, non-energy benefits, recognize past EE
No	No	Yes	Support continuous improvement, identify non-energy benefits, recognize past EE
No	Yes	No	Technology assistance, incentives, peer support
No	No	No	Mandatory efficiency standards

Figure 1 A heuristic of businesses' "concern, conditions, and capacity" (3Cs) for energy efficiency. Source: Janda et al. (2014).

The 3C framework is a simple but holistic way to categorise the factors that past studies have found in fragments, which allows for some interactions between factors. For example, the presence of an energy management system could mirror the business' *capacity* to act on energy efficiency policies while the top management's pro-environmental culture could bring about the business' *concern* about energy efficiency. And the co-presence of such *concern* and *capacity* could render the business even more likely to adopt energy efficiency measures. In other words, the nine possible combinations in Janda et al. (2002)'s heuristic could be seen as interactions between different factors.

While Janda et al. (2002) accounts for interactions between different factors, it fails to distinguish the *actors* involved in the complex *social world* of energy use in commercial buildings, where each actor could contribute to the 3Cs of energy efficiency in various

degrees and magnitudes. Axon et al. (2012) addresses this particular weakness by treating a commercial building as a community of diverse actors and energy flows. Instead of looking at a business at the organisational level, Axon et al. (2012) focuses on a multi-tenanted office building composed a hierarchy of actors: a landlord, a central building manager, multiple tenanted businesses and their own facilities managers and office staff. One of its aims is to illustrate the complex "interrelationships" between these diverse stakeholders, especially in terms of their legal and perceived responsibilities for energy use. Its conclusion highlighted how shared learning within the building community and different organisational cultures can affect the energy performance of a building. The figure below provides an example of energy flows and associated actors in a multi-tenanted commercial building.
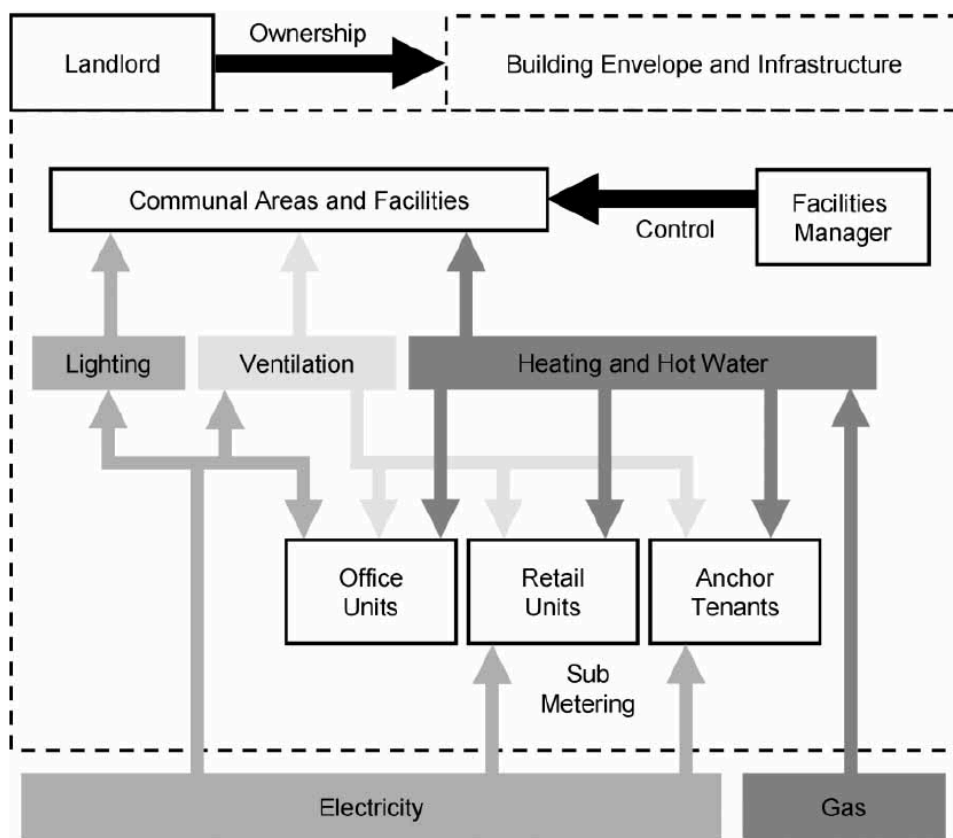
Figure 2 Energy flows and associated actors in a hypothetical shopping mall with offices. Source: Axon et al. (2012, p.469).

Contrary to Axon et al. (2012)'s analysis of energy use in a particular building, this thesis—in accordance with the ESOS policy criteria—focuses on energy use of a

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particular business. Therefore, the business could occupy multiple buildings, expanding its building community. Janda et al. (2014) have noticed the tendency for researchers to study commercial energy efficiency "on a building by building basis," which overlooks the intricate relationship between individual buildings and their associated organisations (p.439). For example, there may be discrepancies between the perspectives of subsidiary building-occupiers and the energy management strategy of the umbrella organisation (Ibid.; Cohen and Bordass 2015, p.3). Therefore, in defining its unit of analysis as a large ESOS-qualified business, the thesis may better explore the links between the business and its subsidiary buildings. Below is a simplified schematic of actors relevant to this thesis, where the solid-line boxes represent basic types of actors and the dashed-line boxes could be added if applicable.
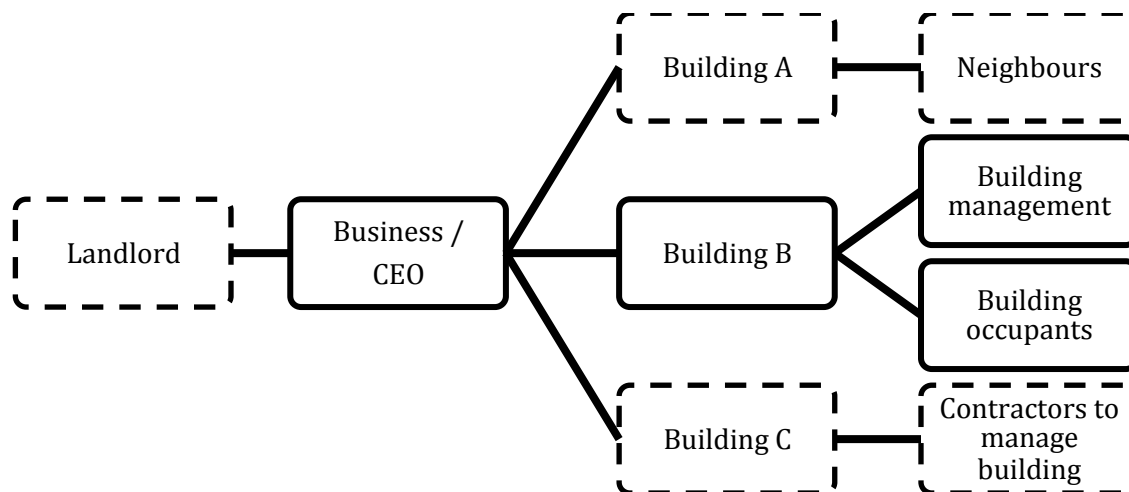
Figure 3 A schematic of actors in a business' use of energy. Source: author's own.

In 2014, Janda came up with a hybrid conceptual framework that combines her work on the 3C framework and Axon et al. (2012)'s buildings-as-communities framework. She critiques that existing literature either addresses factors at the organisational level (such as 3C), or at the individual occupant level, "but it rarely crosses the analytical boundaries between these two groups" (p.48). As a result, she proposed to analyse the 3Cs at both the organisational level and individual level in order to focus on the *interplay* between building occupants and business organisations (p.49).

According to the framework, the *organisation's concern* for energy is often shaped by governmental policies whereas *individual concern* pertains to personal values and habits. Moreover, *organisational capacity* to act on energy efficiency opportunities is often constrained by the availability of energy data and the organisation's energy management structure whereas *individual capacity* more or less relates to occupants' knowledge of energy efficiency. Last but not least, *organistional* and *individual conditions* could favour drastically different energy efficiency measures: equipment retrofit opportunities are identified for the organisation while the staff's inefficient use of computers and radiators necessitate programmes targeted at individuals. Viewing relevant factors in this fashion also gives rise to some "grey areas" which Janda (2014) deems is neither organisational nor individual. For example, if the office culture for lunch is that everyone leaves the office together for an hour, then shutting off all lights and equipment should be an easy task. This culture could be institutionalised by the business and reinforced by staff members. In a sense, it exists at both the organisational level and the individual level.

The hybrid framework is the most suitable method to categorise factors influencing the energy efficiency of businesses: it takes into consideration of factors that interact with both individual occupants and the organisation as a whole, while remaining a broad enough typology to make comparisons. This thesis will use the hybrid framework—as seen in the table below—to analyse factors identified by consultants during the ESOS audits of their client organisations.

	Concern	Conditions	Capacity
Organisation	Legislative requirements; leases	Building retrofit opportunities; thermostat setpoints; operational hours; provision of space and equipment	Energy management structure; job titles & responsibilities; data availability and granularity
Interaction	Workstyles	Clothing choices; activities outside 'normal' hours	Peer pressure; social practices; workgroup dynamics
Individual	Attitudes; beliefs; habits; values	Use of lights, computers, windows, individual radiators, etc.	Presence of energy champions; expertise and understanding of systems; ability to act on feedback

Table 1 A hybrid framework to characterise factors influencing energy efficiency of businesses. Source: Janda (2014, p.52).

2.3 Energy Efficiency Consulting

This section will cover relevant literature and context regarding energy efficiency consulting for commercial buildings. In Section 2.3.1, a review of UK commercial energy efficiency policies and the new ESOS scheme will justify this thesis' claim that energy efficiency consulting is an important part of businesses' approach to energy efficiency. This same claim is supported by a study of Swedish industrial companies: Palm and Thollander (2010) found that "consultants" are ranked among the most important information sources for energy efficiency (p.3259). Nevertheless, there is a significant research gap regarding how consultants are important. Just as Palm and Thollander (2010), studies that mention energy consultants often regard them merely as a source of information (Anderson and Newell 2004; Schleich and Gruber, 2008). This thesis has not found any study that focuses on energy efficiency consulting, nor has a review of studies about energy use in businesses (Andrew and Johnson 2015). In particular, Andrew and Johnson (2015) only mentioned "auditors" as a *coercive pressure* on businesses along with governmental legislation and industry standards, but did not present any studies on this coercive pressure.

2.3.1 ESOS and Energy Auditing Policies in the UK

In the UK, there exist some tax schemes and incentives for businesses to reduce carbon emissions, which indirectly influence the adoption of energy efficiency measures. However, these green policies are often unstable and many of them have been put to an end by the current government (Vaughan and Macalister 2015). Existing under the same political climate, the policies that most directly address the energy performance of buildings are *audit policies*. Many experts believe that energy auditing is a driver for energy efficiency (Fleiter et al. 2012 p.863; Annunziata et al. 2014, p.364; Dixon 2014, p.443; Morrissey, Dunphy and MacSweeney 2014, p.398). Auditing policies require businesses to be fully aware of how they consume energy and explore opportunities for energy efficiency (Parkinson et al. 2013, p.1493).

Before the new ESOS scheme, energy efficiency in commercial buildings had been addressed by mandatory Energy Performance Certificates (EPCs), which give efficiency

ratings for buildings when they are built, sold and rented (Department for Communities and Local Government 2014). However, EPCs are only based on a predicted model of performance, not on the actual energy consumption of the buildings. Furthermore, the rate of compliance in leased commercial buildings was "only 39 per cent" in 2014, implying the failure of EPCs to drive any energy efficiency improvements (Dixon 2014, p.449). Public buildings require display energy certificates (DECs) that are based on actual energy consumption (Dixon 2014, p. 449; Cohen and Bordass 2015). But, the UK government has been reluctant to impose DECs on the commercial sector (Dixon et al. 2014).

ESOS is a new scheme that is more comprehensive than either EPCs or DECs. It requires large businesses (either having more than 250 employees, or its turnover exceeds 50 million euro and its annual balance sheet exceeds 43 million euro) to conduct an energy audit of its buildings, transport and industrial processes (DECC and Environment Agency 2016). Focusing on buildings, there are several routes to compliance, including an ISO50001 energy management system, DECs, and ESOS' own guidelines for audits. Businesses can choose one or several of these routes, as long as the audits cover all of the energy use (Environment Agency 2015, p.30). Regardless of compliance routes, the audits—which come in a written report—must a) use the most recent year's energy consumption data instead of energy cost data, b) break down the energy usage by assets or activities, c) include site visits, d) have recommendations for energy efficiency improvements, e) be verified by an ESOS lead assessor, f) and signed off by a board-level director (Ibid., pp.32-39). Beyond these, ESOS leaves the organisations and the lead assessors to agree on how the ESOS compliance process proceeds. The lead assessors' main responsibility is to review the existing audits, but they can also conduct the audits for the clients. Either way, the ESOS lead assessors are the only actor with whom the businesses has to interact with in order to be ESOS-compliant. As a result, their input is significant; and the ways in which they give their input—the consulting practice—are the focus of this thesis.

The success of energy efficiency policies depends on the degree of intervention from the government. Australia's National Australian Built Environment Rating System

(NABERS) has been regarded as a success case due to a stronger stance from the government (Dixon 2014, p.449). In comparison, the UK government has much to improve. In fact, one can argue that the aforementioned auditing policies only exist in the UK because they are imposed by EU directives (European Commission 2015). By the once-extended deadline at the end of January 2016—also the start of this thesis, around 6,000 firms have complied while 1,000 firms had notified of their intent to comply (Cuff 2016). However, more than 3,000 firms have yet to comply, leaving the strict compliance rate to be 60% (Ibid.). This is already much higher than the compliance rate of EPCs in commercial buildings, but still suggests more room for improvement. A reasonable assumption is that if a firm has hired an ESOS lead assessor, then it is part of the firms that have complied or will comply late. Therefore, the clients of the energy efficiency consulting practice—as stipulated by this thesis—are all ESOS compliant or soon-to-be compliant. Therefore, the research aim does not explore how the consulting practice leads to ESOS compliance, but to explore how it may lead to the decision to adopt recommended measures.

2.3.2 Energy Efficiency Consultants

In light of the ever-changing policy signal about energy efficiency, the UK energy efficiency industry often needs to adapt quickly to changes in the legislation. For the new ESOS scheme, interested energy efficiency practitioners must go through a separate certification process from professional bodies to become ESOS lead assessors (DECC and Environment Agency 2016).

On top of being ESOS lead assessors, the practitioners may be offering a diverse range of other services such as staff behavioural training to technology installation. They could be self-employed consultants, or part of small consultancies, large engineering firms, facilities management firms, and more. Although formal accreditations of professional bodies may offer some classification, each practitioner has a unique combination of expertise and background (Lutzenhiser 2014, p.142). As a result, the consultants' idiosyncratic *doings, sayings* and *interpretations* can significantly impact their relationship with the ESOS clients, and ultimately, the outcome of the consulting process.

On the other hand, there are several common vocabularies and framings of energy efficiency that have been institutionalised in the industry. A brief overview could serve as a starting point to compare and contrast elements of the ESOS consulting experience. To start off, consultants will most likely discuss the trade-offs between different energy efficiency recommendations: "low-hanging fruits" to describe those that require little to no cost and larger retrofits that have longer "payback periods" (Lutzenhiser 2014, p.145). The payback period—the time it takes for retrofits to pay for themselves—are often used by large businesses to assess whether retrofits are worthwhile (Harris et al. 2000; Prindle and Fontaine 2009). This popular metric creates the expectation that energy efficiency measures must pay for themselves in a fairly short time, which puts retrofits with longer paybacks but potentially larger savings in the long-run at a disadvantage (DECC 2012, p.25). Alternatively, a life-cycle analysis for an energy efficiency measure would examine the full costs and benefits of the measure over its entire lifetime—a metric recommended by the UK Environment Agency's guidance for ESOS compliance (Environment Agency 2015, p.57). Although businesses may already prefer one metric to another, it would still be interesting to take note of the metrics the consultants used when they describe their ESOS recommendations. Other framings of energy efficiency measures could also make an impact: the DECC has found that businesses would adopt measures in order to "[avoid] losses," but hesitate to do the same if they are framed as a potential "gain" (DECC 2012, p.8).

Prior to ESOS audits, energy efficiency consultants would have already accumulated their own observations about businesses from prior experience. For example, they may have an idea about what kinds of measures are favorable to certain types of businesses (Behavior, Energy & Climate Change 2015). In this case, the list of recommendations provided by the consultants may not be exhaustive: they are already bounded by pre-conceived notions of 'what works' as well as their own limited expertise. Additionally, the recommendations may be constrained by the businesses' expressed preferences, etc. All of these inevitable characteristics of the consulting process represent the concept of *bounded rationality*: instead of reaching for the optimal solution, firms and consultants may be settling for any satisfactory solution (DeCanio 1993). This thesis assumes the inevitability of bounded rationality because it is more interested in whether *any*

recommendation is acted upon due to the consulting practice. In doing so, it simply explores the extent to which consultants rely on existing framings and assumptions—as well as clients' expectations—in providing these recommendations.

2.3.3 A Framework for the Consulting Process

Given the lack of studies on energy efficiency consulting, this thesis must borrow concepts from other consulting literature to examine the practice in its entire process. The first area of guidance is from the ESOS requirements. As stated in Section 2.2.1, ESOS audits are based on real energy consumption data and physical site visits, and they must be signed off by a board-level director (Environment Agency 2015, pp.32-39). These requirements already embody certain activities, things, and actors, as well as the order in which activities take place; but they are not enough to suggest a full step-by-step process. This thesis will take an evidence-based and heuristic approach to devise a *process* for the energy efficiency consulting practice based on the consultants' actual experience. On the other hand, other areas of energy efficiency consulting could benefit from an analysis using existing concepts and models. This thesis focuses on three areas: a) models that generally characterise the consulting practice, which often include b) the roles of consultants and c) the types of actors interacting with the consultants.

Pellegrinelli (2002) introduces the nature of consulting: "[through] their work, consultants … have to challenge the world that is shared and lived out by members of the organisation." (p.343). But how exactly does consulting get carried out? In general, models situate consulting between two ends: the *expert* or *resource model* on one end, and the *process model* on the other (Kubr 1996, p.58; Schein 1990, p.61; Massey and Walker 1999). Expert consulting views consultants as experts that deliver their expertise and information to clients, whereas process consulting enables the clients to solve their own problems (Ibid.). Pozzebon and Pinsonneault (2012)'s study of knowledge and power interprets the two extreme models as *dependency* and *autonomy*. In the dependency model, complete outsourcing is common where consultants hold "'technical' control of and responsibility for the results" (p.38). In contrast, the autonomy model situates consultants as a passive coach and clients have control and responsibility of the

results (Ibid.). Scholars have also developed models that lie somewhere in the middle of the extremes: Schein (1990) adds a *doctor model* in which consultants "investigate, … assess … make a diagnosis and suggest a cure" (p.60). Pozzebon and Pinsonneault (2012) propose a *cooperation* model in which consultants and clients are partners (Ibid.).

By default, energy efficiency consulting—as seen through ESOS—dovetails most closely with the *doctor model* of Schein (1990) because the consultants are required to investigate the energy use of buildings and suggest recommendations to render the energy use more efficient. However, as consultants proceed to accomplish the required tasks, they may also engage with the clients in various ways that mirror other models. For example, the client could be very upfront about needing expert information on certain retrofits. When this happens, Palm and Thollander (2010) argue that the client may be restricting itself with the energy efficiency consultant's specific area of expertise; and that the consultant often does not follow up with implementing the expert information (p.3259). But alternatively, the consultant could adopt a more *process* attitude and create situations in which the clients will learn how to examine its energy use. This thesis will supplement Schein (1990)'s *expert-doctor-process* framework with that of Pozzebon and Pinsonneault (2012) to explore the characteristics of the consulting process.

	Expert	Doctor	Collaboration	Process
Consultant's Role	To give knowledge and information	To investigate and find recommendations	To collaborate with clients to find solutions	To build client's energy management capacity
Client's involvement	Passive	Passive	Active	Active
Control of results	Consultant has control	Both share control	Both share control	Client has control

Table 2 A framework for consulting models. Source: adjusted from Schein (1990) and Pozzebon and Pinsonneault (2012).

Beyond these models, scholars also have a range of opinions about the *role selection* in the consulting practice. Massey and Walker (1999) believe that the consultants and the

clients can either clarify roles upfront or re-negotiate roles throughout the process (p.43). To them, role selection is an explicit activity that both parties consciously participate in. On the other hand, scholars like Lippitt and Lippitt (1986) believe that the consultant takes the responsibility of role selection and "fulfills a number of roles that he or she judges to be appropriate for the client, the situation, and his or her own style" (p. 57; Schein 1987; Steele 1975). In this case, the clients take up a reciprocal role: "the 'consultant as teacher' implies a client willing to be a student" (Steele 1975 as interpreted by Massey and Walker 1999, p.41). During the interviews, the consultants may reveal to what extent they choose their own roles and to what extent the roles are decided with the clients. The figure below illustrates a plethora of roles that Lippitt and Lippitt have found for consultants (Lippitt and Lippitt 1986, as interpreted by Spector and Cooley 1997, p.4). Combining these roles with the consulting models could comprehensively address most of the consultant-client interactions in ESOS. Although ESOS may require certain roles of consultants to conduct the audit (such as "alternatives identifier" when identifying energy efficiency recommendations), the consultants have much leeway in interacting with the clients. For example, the consultants may need to go seek out energy usage data for the clients, acting as a *fact finder*. Or the consultants may strongly push for a particular kind of retrofit, acting more as an *advocate*.
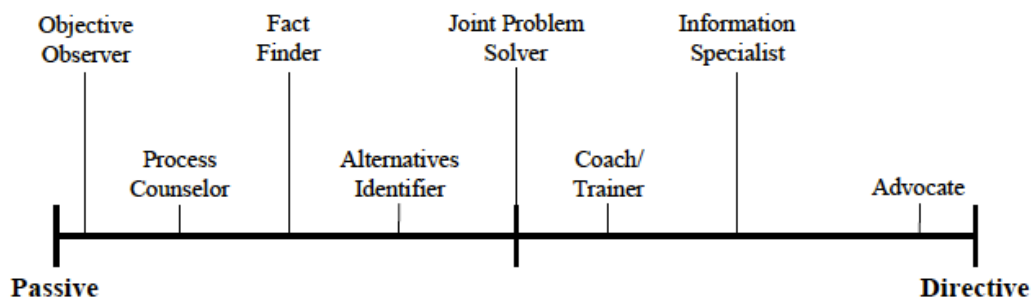
Figure 4 Roles of the consultants. Source: Lippitt and Lippitt (1986) as illustrated by Spector and Cooley (1997, p.4).

Last but not least, a typology to characterize clients is crucial, given the plethora of actors the consultants may have to interact with (see Section 2.2.2). Other than the reciprocal roles of clients vis-à-vis the consultants (e.g. doctor versus patient), there are types of

clients given their degree of exposure to the consultants. For example, the consultant may interact with one individual to initiate the ESOS audit process—the *contact client*. Then, he/she may be directed to another individual who is responsible for the energy use of buildings—the *intermediate client*. Lastly, his/her ESOS report has to be signed off by the *primary client*—the board-level director who often pays for the consulting. This thesis borrows Schein (1997)'s client typology to examine whether energy efficiency consultants interact with different actors using different strategies.

Type	Definition
Contact Client	The individual(s) who first contact the consultant with a request, question or issue.
Intermediate Client	The individuals or groups who or which get involved in various interviews, meetings, and other activities as the project evolves.
Primary Client	The individual(s) who ultimately "own" the problem or issue being worked on; they are typically also the ones who pay the consulting bills or whose budget covers the consultation project.
Unwitting Client	Members of the organization or client system above, below and laterally related to the primary clients who will be affected by interventions but **who are not aware that they will be impacted.**
Indirect Client	Members of the organization **who are aware that they will be affected** by the interventions but **who are unknown to the consultant** and who may feel either positive or negative about these effects (the concept of the "indirect client" was contributed by Otto Scharmer).
Ultimate Client	The community, the total organization, an occupational group, or any other group that the consultant cares about and whose welfare must be considered in any intervention that the consultant makes.

Table 3 A typology of clients in the consulting process. Source: Schein (1997, p.1).

2.4   Conceptual Framework

The overall conceptual framework for this thesis combines existing literature on commercial energy efficiency and management consulting. Moreover, it takes a practice lens to empirically study energy efficiency consulting, through examining the ESOS consulting experience. The analysis of factors influencing businesses' energy efficiency—as interpreted by consultants—give much deserved attention to the dynamic interactions between organisational and individual framings and actions of energy efficiency (Question 1). Then, the consultants' responses to these identified factors are explored through a holistic look at the consulting process, which includes identifying the types of actors the consultant interacts with and the corresponding consultant roles

(Question 2). The success cases are highlighted to demonstrate how given certain existing factors and conditions, the consulting process could give rise to the businesses' adoption of recommended measures (Question 3). Last but not least, the more intangible elements of the consulting practice will be discussed in relation to broader ideals of the practice.

Research Questions	Operationalisation		
	Types of Practice	**Analytical Framework**	**Level of Analysis**
Question 1	Practical Practice	Hybrid framework of 3C and building community (Janda 2014)	Common factors are aggregated from all interview participants, and compared with exceptions.
Question 2	Practical Practice	Expert-Doctor-Process Models (Schein 1991); Consultant's Roles (Lippit and Lippit 1986); Client Types (Schein 1997)	The stages of the process will be defined empirically. For every stage of the consulting process, client types are distinguished and consulting roles are analysed.
Question 3	Practical Practice	Frameworks from Question 1 and 2	Success cases are either explored case-by-case (separate from Question 2), or explored within the consulting process stages for Question 2.
Question 4	Embodied Practice; Defence Practice	Operationalisation of Practice Theory (McDonough 2006)	Practical practice is analysed in Questions 1-3, while the embodied and defence practices are compared and contrasted.

Table 4 The Conceptual Framework. Source: author's own.

Chapter 3: Research Strategy

3.1   Ontology and Epistemology

Studies based on a PTEM perspective assume that businesses can derive absolute approaches to energy efficiency due to their profit-maximising rationality, and compares empirical results against such idealised benchmark. But in reality, businesses do not always act rationally in their approach to energy efficiency because they are also subject

to existing organisational conditions, social dynamics, and individuals' cultures, etc. (Dixon 2014, p.447; Morrissey et al. 2014, p.397). These factors are observed and interpreted by consultants based on their unique perceptions of their ESOS clients as well as idiosyncratic interpretations of the world around them.

In the same vein, the client-consultant interactions, the resulting recommendations of energy efficiency opportunities, and post-audit responses are all part of the consultants' own world of constructed meanings and reality. Broadly speaking, the reality of the actions and interactions among all actors in the energy efficiency industry would not exist without their own interpretations of reality (Gurney 1999). Hence, this thesis adopts a *constructivist* ontological standpoint towards reality. This standpoint corresponds with that of Schein (1999)'s in his study of consulting: consultants and clients "are … in a perpetual process of jointly deciphering what is going on" (as cited by Pellegrinelli 2002, p.349). Moreover, it corresponds with the perspective of practice theory (McDonough 2006, p.633). Accordingly, this thesis takes an *interpretivist* approach to epistemology because actors' interpretations of reality are considered the acceptable form of knowledge (Sayer 2000).

With an interpretivist approach, the researcher's own interpretations also limit the knowledge gained from this thesis. For example, I am not an expert in energy efficiency. Therefore, my interpretation of the more technical aspects of the consulting practice may neglect some of the more subtle points consultants are trying to make. However, I will try my best to ask clarification questions and relay their accounts as accurately as possible. Obviously, while asking questions and interacting with consultants, I will strive to remain unbiased and avoid leading questions.

3.2   Methodology

In this section, the methods of data collection, sampling and analysis will be described along with their rationale, added value and limitations.

3.2.1 Method of Data Collection: Interviews

In line with its ontological and epistemological standpoint, this thesis aims to inductively analyse the empirical data to examine the relationship between identified factors that configure businesses' building energy efficiency and the consulting process that aims to improve them. These data must be qualitative in order to capture the nuanced meanings, actions and motivations of the actors involved. Furthermore, past empirical studies examining a particular practice—such as mentoring, nursing, and a specific food consumption lifestyle—primarily rely on some forms of ethnography and interviews, supplemented by secondary sources such as policy documents (Kemmis et al. 2014, Crivits and Paredis 2013, McDonough 2006, Carmel 2005). As this thesis examines the practice of energy efficiency consulting, it must adopt some of the aforementioned qualitative data collection methods.

In the empirical study of nursing as a practice, Carmel argues that ethnography provides "in situ" observations that can accurately present the practice whereas interviews provide normative generalisations (Carmel 2005, p.2083). However, it is nearly impossible to observe the energy efficiency consulting practice in situ, as ESOS audits are conducted confidentially and prior to the research period for this thesis. As a result, the primary research method of this thesis is conducting semi-structured interviews either in-person, using video-conferencing or via phone. Although interviews cannot give the same depth of context as other ethnographic methods, they "[document] reflective participant's temporal journeys [in energy efficiency consulting] through … [glimpses of] ... the activities that compose them" (Schatzki 2012, p.25).

In terms of the type of interviews, McDonough—in her examination of the practice of public service—conducted in-depth and unstructured interviews with public servants (2006). However, given the limited time and sample size attainable for this thesis, some structure to the interviews eases the task of identifying themes in the data. Semi-structured interviews offer a good balance between structured and unstructured interviews by proposing some guiding questions while allowing consultants to fully express themselves. In this way, the consultants' recount of their ESOS consulting experience will address the same set of elements in the research questions. At the same

time, semi-structured interviews also allow the researcher to interact with the interviewees more to clarify certain statements, which eases the task of analysis because there is more certainty "that the data are telling you what you think they are telling you" (Saunders et al. 2009, p.146).

One could argue that in order to get a full picture of the ESOS consulting process, both the client businesses and consultants should be interviewed. However, the research questions are explicitly structured to examine the consultants' perspective throughout the consulting project, and thus interviewing the consultants is sufficient for the research questions. And practically, it is much easier to access the consultants than client businesses. Excluding the views of clients may be a limitation in terms of the *practical* contribution offered by the results of this thesis. However, many existing practice-based empirical studies focus only on one group of actors in the practice. For example, McDonough (2006)'s examination of public service relies on the views of public servants but not on recipients of the public service. Similarly, Carmel (2005)'s study of the nursing profession focuses on the perspective of the nurses and not of the patients. Crivits and Paredis (2013) made a minor exception in the examination of a particular food consumption practice: they interviewed consumers as well as experts on the consumption practice. For this thesis, exclusively interviewing the consultants is in line with the research design of previous practice-based studies. And regarding expert opinions on the energy efficiency consulting practice, this thesis takes the consultants to be the ultimate experts in the practice given their required commitment to professional development activities.

In terms of the developing the interview guide, Crivits and Paredis (2013) posed "questions concerning the motivation, the internal communication and relationships, … habits and … routines" (p.314). McDonough (2006) posed questions generally addressing the interviewees' jobs—including duties, interactions on the job, most liked and least liked parts of the job. She made sure to never directly ask public servants' views on public service because examining public service *in practice* means asking public servants what they *do* and not what they *think* they do. Accordingly, this thesis makes sure not to pose the question: "what is energy efficiency consulting?"

3.2.2 Sampling Method & Statistics

This thesis aims to examine energy efficiency consulting for commercial businesses through the latest mandatory audit policy—ESOS. And as previously concluded, the practice of energy efficiency consulting can be effectively explored through interviews with the consultants (without the clients). Therefore, the population relevant to this thesis is composed of all ESOS lead assessors, all of whom can be accessed online via official registers of ESOS lead assessors (DECC and Environmental Agency 2016). A caveat is that two of the ten registers only offered a randomised sample of lead assessors (see Appendix 1). However, when multiple random samples were pulled from these two registers, the lead assessors mostly appeared in all of the samples. Therefore, only a few lead assessors might have been excluded from the pooled population. Furthermore, one of these two registers breaks down the samples by region, so a random sample from each region was pooled.

This thesis pooled together all ESOS lead assessors' email addresses in order to send out an email invitation for interviews. The invitation briefly explained the researcher's interest in studying ESOS lead assessors' work for commercial buildings (see Appendix 2). Out of the 544 invitations sent out, there were roughly twenty to twenty-five responses that expressed interest in participating. However, a few were too busy during the data collection period (determined by the researcher to be the whole month of April 2016) and a few had scheduling conflicts. At the end, sixteen interviews were conducted for this thesis, which equates to a sampling rate of 3%. The average interview length was about ninety minutes. The interviewees covered ten regions altogether, including one region in Wales and one in Ireland (Appendix 3). Most of the time, each region is represented by one interviewee. London, the North West and the South East had 4, 3 and 2 interviewees, respectively. See the table below for a summary. This thesis does not assume the sample is representative of all UK regions; it takes an exploratory approach to address the research problem.

Number of Registers	Number of Invitations (Population Size)	Number of Interviewees (Sample Size)	Sample Rate	Regions Covered
10	544	16	3%	10

Table 5 Sampling Statistics of Interviewees. Source: author's own.

Is sixteen interviews enough of a sample? Studies have attempted to estimate the number of interviews necessary in order to reach *data saturation*—"the point at which no new information or themes are observed in the data" (Guest et al. 2006, p.59). One study showed that data saturation occurred after the first twelve interviews (Guest, Bunce and Johnson, 2006, p.59). For another study, data saturation occurred after seventeen interviews (Francis et al., 2010). As a result, albeit the low sample rate of this thesis, the absolute sample size of sixteen interviews is more or less enough to reach data saturation. Nevertheless, given the complexity of this thesis' research questions, the sample size may not be enough to comprehensively address all possible themes. Therefore, this thesis accepts that there may be a research limitation associated with the low sampling rate.

3.2.3 Method of Analysis: A Coding Exercise

Bryman (2015) defines *coding* as "reviewing transcripts and/or field notes and giving labels (names) to component parts that seem to be of potential theoretical significance and/or that appear to be particularly salient within the social worlds of those being studied" (p.568). Coding allows the extraction of elements expressed in the empirical data into aggregated concepts that explain the social phenomena (Czischke 2014). This thesis adopts coding as its method of analysis: it transcribed all sixteen interviews, and coded statements through revisiting the transcripts. Prior to the coding exercise, no pre-defined categorisation of the codes was established. Instead, whenever a statement expressed by interviewees has been considered relevant to the research questions, it became coded (labeled). According to Stull (2003, as interpreted by Czischke 2014) this heuristic coding process generates a richer range of data that fully mirror interviewees' opinions without restriction. This approach dovetails with the data collection method of semi-structured interviews to ensure the data exactly convey interviewees' statements. Note that this open coding approach is influenced to some extent by the researcher's own way of interpretation, limiting the reliability of results. So while deciding what

constitutes an interesting point, the researcher tried as much as possible to be unbiased and not to "cherry-pick" information (Allan 2003, as cited in Czischke 2014).

In this thesis, the codes were firstly used to identify five stages of the consulting process (see results in Section 4.2). Then, they were analysed using the conceptual framework in response to all of the research questions (see framework in Section 2.4). More specifically, statements from different consultants that express similar concepts had been assigned the same code. Thus, it was possible to identify those statements that are shared the most across the sample and representative of general findings. In principle, codes shared by three or more interviewees were considered as findings (Bryman 2015). In some exceptions, particularly interesting codes mentioned by a single or two consultants were also presented in the findings because they help clarifying elements of the consulting practice or offer a countering viewpoint. As a result, the findings represent a clear and well-organized narrative of the consulting process, presented in Chapter 4.

Chapter 4: Results and Analysis

This thesis' research questions assumed a certain order in which the analysis of the consulting practice takes place. They imply that one must first understand the factors of the businesses' approach to energy efficiency (Question 1) before examining how consultants cope with these factors throughout the consulting process (Question 2). This order is based on the *hypothesis* that there are certain elements of the consultants' response to these factors that cause businesses to decide to adopt certain energy efficiency measures identified by the consultants (Question 3). However, this assumption was refuted by the accounts of the success cases: the interviewed consultants claim that most of the time these success cases were successful *only* because of certain factors that the businesses already possess *prior* to the consulting process. In other words, the elements of the consulting process were not significant drivers for these success cases. Therefore, in Section 4.1, this thesis will analyse the success cases (Question 3) together with the factors that influence businesses' approach to energy efficiency (Question 1).

On the other hand, the uptake of energy efficiency recommendations post-audit is merely one way to determine the success of ESOS consulting. There are many other ways in which the consultants believed that their clients were successfully *consulted*. These other details will be analysed in all of the stages of the consulting process in Section 4.2.

4.1   Characteristics of Organisations

4.1.1 Concern

Organisational Concern

Other than legislative requirements that influence a business' attention to energy efficiency (as explained in Section 2.2.1), one of the biggest organizational factors was the landlord-tenant relationship. Four consultants witnessed cases where ESOS clients could not push their landlords to act on energy efficiency (2, 4, 5, 8, 13). Since tenants pay for energy bills; the landlords have no interest in improving the energy efficiency of buildings unless major equipment breaks down. In these cases, it was implied that the tenants could not intervene with retrofits based on lease agreements. Even if tenants might have wanted to reduce energy use due to other 'concern' factors, the lease terms are often too short to reap the rewards of retrofits (8, 11). Moving on to ESOS clients who are owners of buildings such as property developers, retrofits could attract tenants but the resulting energy reduction would just be an indirect benefit (8, 13). However, getting tenants to communally agree on retrofits could also be challenging and disrupting (8). All in all, landlord-tenant factors seem to be completely outside the jurisdiction of consultants. They only stated that perhaps future legislation should demand owners and tenants have binding agreements to divide up energy management responsibilities, as opposed to the weak stance in the ESOS guidance (2, 8).

Another 'concern' factor that consultants seemed to have pointed out was the sector in which the business operates. Housing associations that are private but providing a public service may be more similar to the NHS in having a stronger energy reduction agenda (3, 5). Other than environmental reasons, Janda et al. (2002) found that organisations serving a public service might have fixed budgets for energy and thus have a higher concern to

reduce energy consumption via energy efficiency (p.120). For the traditionally private sector, large corporate businesses may have more concern than smaller businesses, but for profitability reasons (3, Ibid.). Increasingly, these companies' clients may ask—in its standard tender questionnaire—whether the companies have ISO14001 energy management certification (12). Therefore, there is a supply chain value for EE that is being more and more institutionalised (9, 12). Nevertheless, one consultant noted the disconnect between the corporate energy efficiency reputation and the business' employees, which suggests that there is scarcely any interaction between organisational and individual *concern* for energy efficiency (14).

Manufacturing and the hospitality[1] industries are generally interested in EE because of the high salience of energy use, which corroborates with findings from previous studies (2, 8). In comparison, other businesses that occupy *office buildings* are more "frustrating" because energy use is not so salient compared to other expenses (2, 8, 10). For example, a bank wanting to impress people refused to change its building set-up to save a relatively small amount of costs (8). Similarly, a design company lets its employees turn on extra radiators to dry their clothes while blasting AC; and refuses to change because it "cares about staff happiness" (10). It seems that while staff comfort or productivity could be a strategic factor that encourages EE (1, 12, 14), it could also lead to inaction on conspicuous EE opportunities (10).

It is interesting to note that the consultants see the landlord-tenant and structural/sectorial factors as exogenous factors to their work. For the more negative factors, they pointed them out mostly to explain why they do not *attempt* to influence certain clients. Three consultants broadly pointed out that the ESOS clients saw energy as a service cost and energy use as something out of their control (8, 13, 16). One consultant describes the gravity of the situation: "*an accountant would not throw money out the window, but that's what [businesses] are doing with energy efficiency*" (12). Unless an active approach to energy efficiency is institutionalized as a natural concern for businesses like health and safety, these organizational attitudes may persist (12).

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[1] Specific cases included sports stadiums, leisure centres, and a chain of hostels.

Individual Concern

During the interviews, there were no questions explicitly addressing the individuals' concern for energy efficiency such as attitudes and values. Questions were more generally stated like "Why did you think the client organisation…?" However, consultants often pointed them out as factors they observed. Most of them acknowledge that businesses are "made of people and values," and thus refuting the PTEM assumption that businesses make decisions only based on organisation-wide profit-maximising calculations (3). Some of them explicitly attributed the success or failures of EE audits to individuals (5, 12, 14).

Specifically, consultants noticed the diverse *attitudes* of individuals and their *awareness* of energy efficiency. Some observed that directors at the top level have a lack of awareness (7, 9, 10); and that their attitudes are seen as fixed (6, 9). Moving on to the on-site building managers or staff members, their attitudes are dependent on the attitudes or actions of the top (11, 12) but are deemed easier to change via staff awareness programmes (9). Generally, people are interested and willing to cooperate (4, 8), but may be daunted by the amount of work involved (8) or how their actions are evaluated at by the top-level directors (12). Only one consultant mentioned broader factors like age and education, noting that people from a younger generation value energy efficiency more (14).

4.1.2 Conditions

Organisational conditions

When looking for energy saving opportunities, most consultants find that there is usually some equipment or system on-site that the companies do not know about (2, 9, 14). This ignorance goes beyond not knowing what to do with energy systems; sometimes the company doesn't even know the existence of its systems (2, 14). As a result, not only does the company miss many energy efficiency opportunities, it may even put its staff in uncomfortable and unhealthy conditions (14). This means that ESOS can discover both energy and non-energy savings for companies. Uncovering the presence of systems is a

one-off finding, but learning about how to manage the systems is certainly a legitimate audit recommendation that could uncover more energy saving opportunities (conditions). The consultants often suggested implementing a Building Management System (BMS)— a computer-based system that controls and monitors the building's many systems including energy (2, 4, 7).

If some energy system is in place, then opportunities for savings usually start with the settings and operational controls of systems that provide the least disruption to the running of the business. For example, one consultant found that his recommendation about boiler settings was very popular (4), whereas changing building-wide temperature settings may be more difficult (8, 12). People expect to wear shirts in the winter, and thus expect a high temperature setting. On the other hand, the dress code expectation has also gradually changed when building efficiency improved over the past decades: the result of which is that people wear less. There is bi-directional influence between building performance and dress codes, which concerns both the *organisational level* and *individual level*.

After settings and more operational changes, consultants usually suggest smaller and easily recuperated retrofits such as LEDs and motion sensors (7, 9, 12, 16). Some also suggest more efficient fluorescent lights that are more cost-effective or for warm places unsuitable for LEDs (2, 15). In addition, consultants can offer more place-specific recommendations (7, 15). After these smaller retrofits, opportunities for bigger retrofits such as boilers and solar PV panels will also be investigated (explored more in Section 4.2.3). As an exception, a consultant even thought outside of the usual set of opportunities to look at changing the company's nature of production. He suggested the company to look into opportunities to consolidate the buildings it occupies (7). And for a care home that assigns one mini fridge per room, the consultant poses the question of consolidating the mini fridges as well (Ibid.). Instead of adopting energy efficiency measures while maintaining the same level of activity, this consultant has ventured to question the company's core production activites.

Individual conditions

Compared to energy saving opportunities found at the organizational levels, almost all opportunities at the individual level are about 'turning things off' (4, 14, 15). Consultants always find occupants leaving the AC or heating on (7, 2, 9). Or worse, some consultants find that the AC and heating are often turned on at the same time (10, 14, 15). Computers are left on standby overnight (9) as well as motors (5) and fridges (2). One consultant poses the rhetorical question: "*to make a piece of toast in your flat, would you turn on the oven, the gas stove and the toaster altogether?*" He states that this is that catering companies do in kitchens (15).

Some consultants give their own explanations for these behaviours. One believes that people are only concerned with what goes inside their physical bubble, be it cubicles or desks (7). Therefore, opportunities for individual occupants to save energy heavily depend on their concern about energy efficiency. For consultants, the likelihood of adopting energy saving opportunities also depends on staff's job descriptions: they observed that IT people are not enthusiastic about reducing IT energy, and staff in the financial sector pay little attention to energy efficiency (2). Another consultant makes an observation about "girls": they "don't like air movements in legs," giving managers a hard time to control the AC (15). Then again, he thinks that only "girls" go out to do their shopping during lunch hour, and thus need to put on extra radiators to dry clothes wet from the rain (15). This example is highlighted here to demonstrate the importance of understanding consultants' interpretations of reality. Without understanding how they explain occupant behavior, it is difficult to analyse their reactions and recommendations. In this case, the consultant simply decided there was no point in changing the "girls' habits," so he directs his recommendation to the staff manager: "*have a better control of radiators and use of windows, and give up on AC entirely.*"

4.1.3 Capacity

Organisational capacity

A business' organizational capacity to act on energy efficiency begins with having data about their energy usage. At least five consultants reported encountering companies with very limited energy data (2, 4, 5, 15, 16). As a result, some consultants decide not to trust

what the companies tell them about their energy usage because most likely they are ignorant or wrong about something (2, 11, 15). It is unlikely that they *intentionally* lie about something, most of the time they may not able to provide the right people to talk with or the right information (4, 10, 11).

After the availability and granularity of energy data, the organizational capacity depends on the person in charge of energy. It is clear that the people in charge of energy and ESOS compliance have diverse roles and titles (2, 8, 9, 16). Energy managers are common in ESOS companies (2), which makes sense because the companies are big enough to assign a full-time staff member to energy. But sometimes even big companies don't have energy managers (16). Other roles included the facilities manager (see full list in Section 4.2.2). Some facilities managers are knowledgeable of energy systems while others have never been trained about energy efficiency (14). Note that the next section about the consulting process will delve much deeper into how consultants interact with different types of people from client organisations.

In general, companies do not understand or appreciate long-term thinking, perhaps because of the institutionalised short-term thinking of "annual budgets" (3, 12, 13). And some of these large businesses still believe they have limited resources to act on energy efficiency (8, 11, 14, 16). The capacity also depends on company structure: people responsible for 'energy use' and people responsible for 'buying equipements that use energy' do not talk to each other (16), neither do the facilities managers and the retrofit teams (11). A common consultant response to *organisational capacity* is the outsource BMS——which very much resembles the *dependency model* of consulting (6, 13)

Individual capacity

The factors concerning *individual capacity* will be illustrated throughout the analysis of the consulting process (see Section 4.2) because this thesis found that the consultants mostly noted the *capacity* of the individuals they interacted with throughout the process.

4.1.4 Success Cases

Out of sixteen interviews, the consultants were able to share thirteen cases in which the clients decided to adopt their energy efficiency recommendations post-ESOS. Note that these thirteen cases do not encompass all success cases because consultants reported an average of 2.67 success cases out of an average of 11.5 ESOS clients, resulting in a success rate of about 23% (see Appendix 3). However, these are the only cases that the consultants believed were worth expanding upon, and thus this thesis views them as exemplary success cases. Just as previously noted, these success cases were mostly caused by existing factors that configure businesses' approach to energy efficiency; six cases relied on the consulting practice as a success factor. Even so, five cases demonstrated that the consulting practice only emerged as a factor because of another existing factor. In one case, the *intermediate client* "had influence to set up policies," indicating a *Capacity* to act on energy efficiency (1). And the consultant just happened to talk to the right person, and was able to get her message across in the ESOS report. In two other cases, the *Capacity* was demonstrated by the presence of "good" or "experienced" engineers as *intermediate clients*, due to which the consultant felt that he could "bounce ideas with" them (15.1, 15.2). In these cases, the consultant was able to act as a "joint problem solver" with the clients (Lippitt and Lippitt, 1986). In another case, the clients were already interested in potential energy efficiency measures, indicating *Concern* (5.1). As a result, the consultant felt that they personally "got on well" with the *intermediate client* and the *primary client*. There was only one case where the consultant's push was the *main* success factor (10). But contrary to this thesis' assumption, the *consulting* did not happen during the ESOS audit; it happened after the *primary client* had already signed off on the ESOS report. The consultant was strongly advocating for a retrofit measure, and actively pursued the client for four months until the client decided to adopt the measure. This case is by all means an exception in which the consultant was an *advocate* of a recommendation and challenged a hostile audience (Lippitt and Lippitt, 1986).

Overall, nine cases exhibited the *Concern* for energy efficiency as a primary factor that caused the adoption of recommendations. For two of these cases, the *Concern* was

mainly pushed by the business' customer to become more energy efficient (9.1, 9.2). Other cases dealt more with *individual concern*. For three of these cases, the *Concern* was expressed by the *intermediate clients, who were* also able to influence the *primary client* (2, 5.1, 5.2). For the rest, the *primary clients* already had *Concern* for energy efficiency (13, 15.1, 15.2, 16).

There were eight cases that relied its *Capacity* to adopt energy efficiency recommendations. Five of them relied on the *individual capacity* of the *intermediate clients*—energy and facilities managers as well as engineers (1, 2, 5.1, 15.1, 15.2). For the rest, the organisations were long-term clients of the ESOS lead assessors (11, 13, 16). Since the ESOS lead assessors would be providing energy management *capacity* both before and after ESOS, they were able to ensure the adoption of ESOS recommendations.

Only one case had *Conditions* as a success factor (12). In this case, the consultant believed that it was the ESOS policy itself that naturally caused the client to realise how much energy their commercial tenants were wasting, especially for after normal hours activities. As a result, the client installed sub-meters to directly charge its tenants' energy use, hoping to decrease its energy costs and induce its tenants to decrease its energy use. This particular *Condition* is an interaction between the organisation and its occupants: the landlord organisation sets normal working hours whereas occupants decide how to use the space after working hours.

Just as this *Condition* was addressed by the adopted recommendation for case 12, all other success cases adopted measures that addressed the energy efficiency *Conditions* (or opportunities) found in client organisations. For all but one, the adopted measures were some formed of retrofits—addressing an *organisational condition* (5.1, 5.2, 9.1, 9.2, 10, 11, 12, 13, 15.1, 15.2, 16). Two cases addressed an *individual condition* by administering staff awareness programmes (1, 10). Three cases adopted measures that improve the *organisational capacity* to act on energy efficiency via putting in place some energy management processes (1, 11, 16). One of these cases also established energy champions, which strengthened the *individual capacity* of occupants (1). In this particular case, the client was not interested in costly measures, but was willing to work on a general

"cultural shift" towards energy efficiency. The table below summarises the factors influencing the success cases.

Consultant Number	The factors that caused the decision to adopt recommendations	The factors addressed by the adopted recommendations
1	Capacity → Consulting	Conditions; Capacity
2	Concern; Capacity	Conditions
5.1	Concern → Consulting; Capacity	Conditions
5.2	Concern	Conditions
9.1	Concern	Conditions
9.2	Concern	Conditions
10	Consulting	Conditions
11	Capacity	Conditions; Capacity
12	Conditions	Conditions
13	Concern; Capacity	Conditions
15.1	Concern; Capacity → Consulting	Conditions
15.2	Concern; Capacity → Consulting	Conditions
16	Concern; Capacity	Conditions; Capacity

Table 6 Decisions in Adopting Recommendations & Associated Factors. Source: author's own.

4.2 Consulting Process

This section further explores the elements of the energy efficiency consulting practice in five stages of the ESOS audit process (see the figure below). As explained in the conceptual framework (Section 2.4), these stages were developed empirically through the consultants' accounts of their ESOS experience. In each stage, the consultants are interacting with different types of clients, and may use different strategies—a combination of sayings, doings and motivations—to carry out the consulting practice (Schein 1997). Note that this five-stage process is an archetype; and sometimes the consulting process may include iterative loops (connected by the patterned arrow).
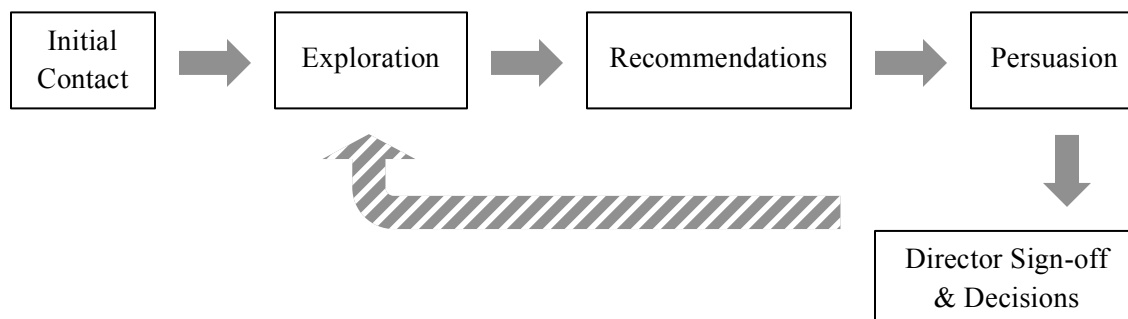
Figure 5 Stages of the Consulting Process in ESOS. Source: author's own.

4.2.1 Initial Contact

There are various ways through which energy efficiency consultants gained work as ESOS lead assessors. Some were contacted by clients who searched for them on the official registers (5, 16); and others gained clients through "word-of-mouth" referrals (2, 5, 16). Some were approached by existing clients to work on ESOS, which—as previously discussed—was a successful factor that led to the adoption of ESOS recommendations (3, 11, 16). However, some consultants found it difficult to win ESOS work, and "had to price low" to be competitive (1, 4, 8). These consultants were self-employed, and felt the challenge of competing with "the big guys" (Ibid.). They complained that pricing the work low meant shorter time spent on the audits, and thus negatively impacting the audit quality (Ibid.). A main cause for this challenge was that the clients expected ESOS to be a quick and cheap "tick-box" exercise, overwhelmingly felt by ten consultants (1, 2, 4, 5, 7, 8, 9, 12, 13, 14). Overall, the clients were "irritated" and even "angry" that they had to comply with ESOS (1, 2, 4, 5, 14), showing reluctance by hiring the consultant very close to the deadline (3, 5, 14). All in all, ESOS clients express a general hostile attitude towards the ESOS policy, which translates to viewing the consultant as a "representative of the legislation" and acting "closed" (6, 14). Against this backdrop, other stages of the consulting process will reveal how consultants cope with their perceived expectations of the clients.

In terms of the specific *contact clients* that began the initial dialogue with the consultants, they range from those responsible for the organisation's energy use (the *intermediate clients*) to the CEO or finance directors (the *primary clients*) (1, 4). These people are most likely carriers of the aforementioned client expectations. On the other hand, *contact clients* could also be other energy efficiency consultants or certification bodies who are effectively sub-contracting the ESOS lead assessor role (2, 4, 12). In this case, the ESOS lead assessors felt that the other consultants were another stakeholder in the consulting process. Sometimes differences in audit style or opinions on recommendations emerge, causing the ESOS lead assessors to act more diplomatically (2). Nevertheless, the ESOS

assessor could also go against the *contact client*'s opinion if he already had separate communication with and approval from the *primary* or *intermediary client* about certain recommendations (4). This experience is corroborated by one of Schein (1997)'s case studies, in which he reflects that if the *contact clients* are not the *primary clients*, the consultant needs to focus his attention on the problem of the *primary client* (p.8). He further argues that in a *process model*, it is much better to communicate directly with the *primary client* since "one cannot take the word of the contact or the immediate clients on what the primary client might want or need" (Ibid.). This view was corroborated by quite a few ESOS lead assessors (8, 9, 14, 15).

4.2.2 Exploration

The Exploration stage includes all elements of the consulting practice that involve finding out how the business consumes energy in its building(s), before forming the recommendations. In this stage, the consultants could be in contact with a plethora of actors, but they are mainly *intermediate clients* and never the *primary clients*. Schein describes *intermediate clients* as "individuals [who] get involved in various interviews, meetings, and other activities as the project evolves" (1997, p.1). This thesis has found that *intermediate clients* are either those responsible/assigned to handle the ESOS project or the employees and occupants of the buildings. From now on, these individuals will be called the *responsible clients* and the *occupant clients*, respectively.

Generally, the *responsible clients* are the one-site managers who have control over the energy use of buildings (3, 4, 11, 12, 13). Other *responsible clients* include *office*, *safety*, *energy*, *environmental managers*, as well as in-house or contracted *facilities managers* (2, 3, 4, 5, 9, 11, 12, 14). Interestingly, consultants did not particularly single out *energy managers* as the ones from whom they could get the most information for the exploration stage. Instead, consultants emphasised that *engineers* or those with an engineering background are the best *responsible clients* to interact with, not just during exploration but also in the overall consulting process (3, 4, 11, 15). This implies that consultants feel more comfortable with those who share the same background as them, even though their job often demands that they speak to those without any experience with energy or

engineering. Perhaps speaking with engineers just makes the communication easier; but they also believe that interacting with engineers allowed them to collaboratively examine the energy use and come up with opportunities together (Ibid.). This suggests that consultants prefer the *collaborative model* of consulting, not merely the *doctor model* as indicated by a straight-forward audit process (Pozzebon and Pinsonneault 2012). In contrast, some consultants revealed that sometimes *responsible clients* were some "unlucky" or inexperienced "minions" (5, 7, 8, 12). Although it is difficult for consultants to truly discover the reasons for these assignments, some believe they are haphazard and others believe they reflect the businesses' wish to appoint someone who knows the organisational culture (Ibid.). The latter case reveals that organisational culture is important in a businesses' approach to energy efficiency, but often acts as a "baggage" that prevents a fresh or bold take on energy-related issues (14). Sometimes the consultants had to "track down" *responsible clients* themselves, suggesting a rough takeover from the *contact client* (2, 4).

Beyond meeting the *responsible clients*, the consultants could be exposed to three kinds of data: *desk-based*, *buildings*, or *people* (also known as *occupant clients*). In the most limited cases, the consultant may only receive energy use data via email or assess existing audit reports—both *desk-based* (2, 8, 13); and the *primary clients* are reluctant to allow access to *occupant clients* (2, 6, 8, 11). In the latter scenario, the *occupant clients* also become *unwitting clients* who cannot be accessed by consultants but are still impacted by ESOS results. Schein (1997) believes that the welfare of the *unwitting clients* may not be considered as much as the *primary clients* (p.9). For example, in the success case in which the consultant convinced the business to adopt an efficient ventilation retrofit, the consultant might not have noticed the severity of the hot temperature in certain periods if he had not interacted with the staff (10). Some consultants were able to interview *occupant clients* about their routines, preferred temperatures, air freshness, etc. (2, 12, 13, 14). But in most cases, the consultants primarily relied on the required on-site audit of buildings to explore their clients' energy use. Some even insist on auditing buildings when no *occupant clients* were around, so they can "objectively" see which equipment was unnecessarily left on (12, 15).

In terms of selecting and synthesising the audit findings, consultants have used several sets of industry-defined criteria in accordance with the ESOS compliance routes. Many stated that they simply conducted an audit that satisfies ESOS' basic requirements, which included "profiling" overall energy usage by buildings, equipment and activities (1, 3, 7, 9, 11, 14). Beyond the basic requirements, some use other standards such as DECs, the British standard, CIBSE standards, SAP, and the Energy Institute's guideline (2, 7, 8, 9, 15). The differences between these sets of criteria are out of the scope of this thesis; but some consultants expressed that using DECs was not enough to comply with the basic ESOS requirements, pointing out a contradiction in ESOS' own policy guidance (2, 7, 13). Overall, it was implied that the consultants could use their preferred criteria. The most comprehensive set of criteria was deemed the ISO50001 standards, which consultants were only able to use in a few cases—despite being the default route by the ESOS policy guidance (3, 7, 12, 13, 14; Environment Agency 2015, p.22). In contrast with the other criteria, the ISO50001 route was mostly chosen by clients prior to the audit; the consultant does not have a say in this decision (Ibid.).

If the clients expressed certain *Concern* for their energy use, the consultants would generally explore more beyond the fixed sets of industry criteria (1, 2, 3, 4, 5, 7, 8, 11, 13). One consultant explains that the "job is about tailoring to what [the clients] want as well as an ESOS audit" (8). For the clients interested in larger retrofits, the consultant would develop more accurate payback periods and quotes from manufacturers. With existing and long-term clients, the consultants were allowed and willing to "spend more time to get the details right" (2, 11, 13). Nonetheless, a general complaint was that consultants had to conduct too many audits in a short time, and thus did not have enough time to investigate further (3, 4, 8, 10, 11). They blamed this on having to price their work low to win contracts and having to meet tight deadlines, both of which are factors imposed by the clients which the consultants felt they had no control over.

Note that the metric *payback period* was used in the Exploration stage. In general, this thesis found that this metric dominated the consultants' framing of energy efficiency measures, which goes against the ESOS guidance's advice (Environmental Agency 2015).

4.2.3 Recommendations

After the exploration stage, the consultants are required to come up with a list of recommended energy efficiency measures. Other than a few cases in which the consultants' job only entailed putting together recommendations from existing audits (2, 7, 13), most of the time consultants were able to give their own list of recommendations. Some think that ESOS has required the list to be too much of a "shopping list" risking to be too generic (2, 8, 13), while others believe identifying a broad range of possible measures is beneficial to the clients (2, 7, 8, 9, 10, 11, 12). Most of the latter group of consultants provided a broad list so that the clients can choose the measures according to their financial criteria (9, 10, 12). In this sense, the consultants do not act as *advocates* for specific measures but are more or less *alternatives identifiers*. This seems like a normative stance on how energy efficiency consulting should be carried out. Some consultants explicitly used their clients' financial criteria to develop the list of recommendations (9, 11, 15). In this case, the consultants are limiting themselves to the pool of measures that the clients claim to be comfortable with prior to the audit, which is a *bounded rationality* problem that potentially limits the energy savings potential for the client. All in all, most consultants believe that they have "control over the recommendations to a certain extent" (4, 5, 8, 10, 11), implying that they developed the recommendations based on their own experience and some expectations of the clients. For example, some consultants were able to use *life cycle* as a metric in their recommendations (13, 16). But if clients did not want a life-cycle analysis—requiring more consultant man-hour, then the consultants would oblige them and return to *payback periods* (4, 5).

Consultants also revealed other specific approaches to frame their recommendations. For example, many consultants presented energy *wastage* in terms of *costs* to raise the clients' attention, then presented recommendations to *avoid* these costs (6, 9, 11, 14). This is in contrast with the rhetoric of presenting *savings* that energy efficiency *investments* can make. Just as other studies found, these consultants believed that clients respond more to *avoided losses* than to *potential gain* (DECC 2012, p.8). More generally, some consultants would highlight a few core areas within the broad list of

recommendations (3, 12). And many consultants engaged in the prioritisation of recommendations according to the *energy hirarchy* (1, 2, 3, 6, 7, 9, 11, 12). They would recommend that clients adopt the behavioural, operational and cheaper measures first. Then, when the benefits are clearly demonstrated, move on to more capital-intensive projects. The consultants believe that energy efficiency is about accumulating "incremental changes;" one used an analogy to professional cycling:

> *"The successful cycling teams are looking to shave off a second here, there. Not looking to shave off a large chunk of time in one go with one action. They change the kits people wear, change shape of ... It's that cumulative effect that takes to win." (16).*

Consultants are aware of the *energy efficiency gap*—energy efficiency measures are hard to sell compared to other products (9, 13). In response, some relied on putting recommendations into *bundles*, so that measures with longer paybacks seem more attractive when combined with simpler measures (6, 12, 14).

Beyond listing and prioritising recommendations, some consultants became more involved through including more "implementation measures" such as creating "action plans," running different "financial models" for measures, and "helping with process" (8, 9, 11, 14). One consultant strongly voiced against this, saying "it is up to clients to implement measures" (5). For this consultant, he fears that putting implementation measures would appear as if he is just trying to earn another contract. This could be remedied if ESOS' guidance on recommendations was clearer and in much more detail (4, 13). In general, consultants believe being "pragmatic" and achieving "clarity" with recommendations is important (4, 5, 9, 11; 1, 3), although some believe that challenging the views of clients also means a job well done (3, 7).

4.2.4 Persuasion

Once the consultants have come up with a list of recommendations, there is usually a stage of talking to people about them. This happens before putting the report in front of the board-level director. Generally, consultants expressed the necessity of an in-person conversation with the *responsible client* to go over the recommendations and make sure

they are onboard (1, 5, 11, 13, 14, 15). They believe that if the *responsible client* endorses the recommendations, then they could help persuade the board-level directors. Additionally, the *responsible clients* are the ones who will end up implementing the recommendations, so it is crucial to gain their approval. This mimics a more *collaborative model* in which the consultants seek *responsible clients* as partners in "solving the problem" (13). There could be some re-negotiation in which the *responsible clients* ask for alternatives (10), in which case the consultants could revisit the Recommendations or even Exploration stage, as the patterned arrow suggests in Figure 5. Some consultants also got the chance to speak to the *occupant clients* again, noting the importance of influencing this group even prior to implementing some staff behavioural or operational measures (12, 15). The consultants rarely got to speak to the *primary clients* before they sign-off on the ESOS report, although some expressed the need to convince "the finance people" if there are measures with longer payback periods (5, 16).

Assuming that they are speaking with *responsible* or *primary* clients, consultants adopt various strategies and corresponding roles to communicate the recommendations. The first strategy is to be the *information specialist*, in a rather *expert model* of consulting (4, 7, 8, 10, 11, 12, 14). But instead of using a directive tone, consultants found that adopting a more advisory and supportive tone works well, asking, "have you thought about this?" (4, 10, 11). Moreover, some consultants emphasise the advantage of showing the *responsible clients* something they "did not know" because people would express "genuine surprise and be grateful" (4, 10, 12, 14). Nonetheless, although consultants could "positively stimulate clients" with large potential savings (3, 6, 11, 12, 14), they also know that some clients will not "change" once the ESOS compliance is complete (7, 14). Interestingly, one consultant explicitly used the phrase "institutional issue" to describe businesses' hesitation to accept information from consultants (12). This rationale places the issue of distrust at the industry level, as if it is larger than *individual* and *organisational* concern. Some resorted to "the internet" or case studies to gain acceptance (4, 5), but many realised that being an *information specialist* is not enough to persuade clients to adopt recommendations.

Beyond providing information, some consultants discovered that providing new *tools* and teaching *skills* is effective in winning the approval from *responsible clients*, as their personal career could be benefitted (4, 12, 14). This vaguely suggests a move towards a *process model* in which the consultants—while pushing for recommendations—indirectly strengthened the clients' own *capacity* to tackle energy efficiency. Others resort to changing the *framing* and *language* of recommendations so that a "non-informed, non-energy person can understand" and be aspired (4, 7, 12, 13, 16). For instance, one consultant compares using a life-cycle thinking of retrofits to buying cars: "*when you buy a car, you don't just think of cost, you look at miles per gallon, running cost, service, etc.*" (16). Indeed, explaining why and how the recommendations are formed enabled the clients to understand the problem so that they can "deal with the potential issue" (4, 12, 14, 16). Again, this demonstrates that consultants cared about empowering the *capacity* of clients in a *process* model. Others attempt to speak from the clients' perspective by putting savings in terms of businesses' units of production and asking "*what makes [clients] get out of bed?*" (2, 4, 5, 6, 8, 11, 16). They believe that "*there are lots of ways to skin a cat*" as long as the ends justify the means (5, 26). For example, with subjects like "global warming" and "sustainability", some consultants will bring them up if the clients are receptive (2, 4, 6); but others have actively avoided some given their observations about the clients (6, 7, 9, 14, 16).

Above all else, ten consultants also appealed to the "human side" of clients. Once novel finding was that many consultants made sure to "not overstate the importance of what [they are] doing" (4, 5, 7, 9, 14). If the clients know that the consultants also recognise the difficulties in addressing energy efficiency, then there is a better chance of reaching some common ground. Moreover, consultants noted the importance of maintaining a good relationship with the clients throughout the entire consulting process (3, 10, 11, 12, 13, 16).

4.2.5 Director Sign-off and Decisions

Once the *responsible clients* approve the list of recommendations, the ESOS report or a summary goes to the board-level directors—the *primary clients*—for the mandatory

director sign-off. Many consultants think that this is one of the most effective requirements of ESOS (2, 8, 11, 12, 13, 16). In many cases, the *responsible clients* had already been pushing for energy efficiency measures before the Persuasion stage or even before the ESOS project; but they were never able to gain the approval from the *primary clients* (6, 7, 11, 12, 13, 16). Consultants note that the barrier is not just an issue with the *primary clients' individual* lack of concern for energy efficiency; it could be an *organisational* "corporate culture" as well. And consultants believe that the mere act of putting their ESOS reports in front of the *primary clients* could help remedy such barrier.

In terms of administering the director sign-off, the consultants were not able to deliver the ESOS report in person to the *primary clients* in almost all of the cases (1, 2, 3, 4, 7, 8, 9, 11, 14, 15) Generally, they believe an in-person delivery would be helpful. Some offered an in-person presentation, but no one accepted (2, 4, 8). Others accept the remote delivery as a standard part of the consulting contract (1, 3, 11). In a few exceptions, a good personal relationship with the *primary clients* enabled an in-person delivery, which could lead to a successful outcome (see Section 4.1.4) (2, 4, 7, 9, 14, 15). However, the consultants made it clear that these in-person meetings were initiated by the *primary clients* since they already had a keen *concern* for energy efficiency, regardless of the consultants' actions.

Other than the success cases in which the *primary clients* had informed the consultants of their decision to adopt some recommendations (refer to Section 4.1.4), multiple post-audit results could happen. Some consultants began to check in with the clients a few months after ESOS compliance (3, 5, 8, 12). They generally leave some buffer period so that there is no conflict of interest between the more *objective* activity of listing opportunities for savings and the more *commercial* interest to take on additional consulting work (4, 5). Some are even more passive: they prefer to wait until another mandatory audit—such as ISO50001 or the next ESOS compliance in four years' time— to follow up with clients (3, 4, 7, 12, 14, 16). In the success cases, the consultants are generally engaged in feasibility studies or project management for certain retrofits (5, 7, 9). Rarely do consultants attempt to push for businesses to act after the director sign-off:

they are technically not under any contractual relationship with the businesses anymore (12).

4.3   Embodied Practice and Defence Practice of Consulting

The elements of the consulting practice discussed so far—strategies, motivations, interactions, framings etc.—concern the *practical practice* of energy efficiency consulting (McDonough 2006). Additionally, the researcher asked the consultants what they most like about their jobs as well as the most important elements of their jobs. The responses to these non-leading questions provided reliable findings about the *embodied practice* of consulting—elements of consulting that had not been so visibly illustrated.

Other than having an enthusiasm for energy efficiency (4, 12), an *embodied practice* could be being a "good observer" of both people and buildings, "[reading] between the lines" (2, 7, 9, 10, 12). In addition, being a good communicator, having "people skills" and "being honest" are all included in the *embodied practice* (4, 5, 6, 9, 10, 11, 12, 13, 14, 16). The consultants themselves are conscious of being able to speak to different types of clients, just as Schein (1997) had claimed. Many claim that "experience" and "expertise" are necessary in the consulting practice, generally conforming to the *expert* model of thinking (1, 2, 3, 4, 5, 6, 10, 13, 14). On the other hand, consultants also emphasise "learning" and "meeting interesting people" as part of the practice, exhibiting a feature more common in the *process* model (7, 9, 11, 12, 14, 16). The only negative *embodied practice* that the consultants revealed was the large amount of traveling involved in conducting on-site audits (6, 9, 11). This is an *embodied practice* because it is something they accept as inevitable in their line of work.

But the consultants had more to say: they voluntarily and eagerly expressed their views on ESOS and other energy efficiency policies. The fact that the consultants revealed these views without being prompted conveys that there are some elements of the energy efficiency consulting practice that they were not able to fulfill during the ESOS experience. Therefore, these elements should be regarded as a part of the consulting practice, but as a *defence practice* in which consultants defend their vision for energy efficienc consulting (McDonough 2006).

To many consultants, energy efficiency consulting is a practice that is "meaningful" and "worthwhile" (2, 3, 5, 6, 9, 11, 12, 16). To them, the practice is associated with "doing good" because energy efficiency is a "good" strategy. Indeed, some explicitly identified themselves as "environmentalists" (2, 16). Therefore, they become frustrated when businesses do not believe energy efficiency to be important or do not adopt good practices of energy efficiency after the consulting process (1, 2, 5, 9, 11, 12, 16). Many do not believe they themselves can change the elements of the consulting practice to ameliorate this situation. Instead, they believe that energy efficiency consulting must be supported by a strong and stable governmental engagement, which currently does not exist (1, 2, 5, 6, 8, 9, 10, 12, 14; Dixon et al. 2014). For them, the government engagement should come in several ways. Firstly, some consultants talked about a previous EU-funded programme in which SMEs could receive free audits from consultants (2, 8, 14, 16). They conveyed that the one-on-one interaction with the business owners (the *primary clients*)—as demanded by the programme—was a large success factor. Moreover, if the consulting practice is entirely funded by the government, the consultants became free of *commercial interests* and could solely focus and deliver on the consulting practice. In terms of ESOS, they criticised the government for its threshold of larger businesses: it does not take into account of energy intensity and relieves smaller businesses of the responsibility (2, 3, 8, 12). More significantly, they pointed out the Environment Agency has no enforcement power, without which the *practical practice* of the consultants is inadequate (2, 7, 9, 10, 12, 13, 14). This demonstrates that the *habitus* of energy efficiency consulting practice must be aligned with the *field* that protects the value of energy efficiency. Furthermore, some believe that the consulting practice is only effective if businesses are required to adopt some recommendations (2, 5, 7, 9, 10, 12), coupled with a tax on energy use and intensity (2, 3, 7, 8, 9). This further conveys consultants' *defence* of their ideal vision of energy efficiency consulting: it should be a practice mainly concerned with helping clients adopt measures, not concerned with persuading clients to value energy efficiency. Only one consultant voiced his opposition to this ideal: requiring the adoption of measures "*would really be government interfering with the market*" (13).

Chapter 5: Conclusion

The research aim of this thesis is to use a newly implemented mandatory energy auditing policy (ESOS) to examine the practice of energy efficiency consulting, and to explore how concrete elements of the consulting practice influence the adoption of energy efficiency measures in UK commercial buildings. The study of energy efficiency in commercial buildings has a significant societal relevance since energy use in the UK commercial sector accounts for a large amount of emissions, thus contributing to climate change issues (Axon et al. 2012, p.462; Dixon et al. 2014). The ESOS policy mandates large UK businesses to conduct an audit of its energy use in buildings and associated energy efficiency recommendations. The ESOS lead assessor is brought in as a consultant to conduct the audit and induce businesses to adopt recommended measures.

Auditors engaging in a consulting capacity in the commercial building sector are rarely studied. But they are an important actor who interact with businesses and potentially influence them to adopt energy efficiency measures. This thesis brings a novel insight into energy efficiency consulting by examining the consultants' accounts of their ESOS experience. Through semi-structured interviews with sixteen ESOS consultants, the thesis offers a first-hand policy evaluation of ESOS in terms of the characteristics of the complying businesses as well as the consultants' responses throughout the audit process. In doing so, this thesis recognises the usefulness of existing concepts of consulting—including the expert and process models of consulting and the consultant's roles vis-à-vis different types of clients—in elucidating some of the more nuanced elements of the consulting process. It hopes that by introducing these concepts to studies of energy efficiency, it is opening the door to a whole range of future research possibilities, including exploring the interactions between different services offered by consultants such as energy efficiency audit and retrofit implementation.

In addition, this thesis is arguably the first study of energy efficiency consulting using a practice-based perspective. It treats the consulting process as a social practice, composed of the consultants' doings, sayings and interpretations as well as the broader values and visions associated with the practice. By applying a specific operationalisation of practice

theory to examine energy efficiency consulting, this thesis introduces another empirical application of practice theory, expanding it to the consulting field. The results for each research question are summarised below.

Question 1. What are the factors that influence the energy efficiency of buildings of the client organisations, as identified and interpreted by consultants in the energy audits?

Consultants identified legal and industry factors that influence the businesses' organisational concern for energy efficiency. Most of these factors (barriers) are treated as exogenous to the consulting process that the consultants could not control or remediate. However, there seems to be a gradually institutionalised concern for energy efficiency that is pushed by customers of ESOS businesses: having ISO50001 standards is becoming a prerequisite in tender contracts. In terms of individual concerns for energy efficiency, the findings corroborate with existing literature that the attitudes of the top management are important but mostly hard to change, whereas those responsible for energy management can interact much more with—and be influenced by—the consultants.

In terms of the opportunities for energy efficiency, consultants were generally able to find many aspects that the businesses were ignorant of. They range from simple retrofits and operational changes to staff awareness programmes and larger retrofits. However, the organisational capacity of these large UK businesses to respond to recommendations is lower than expected: many consultants had to act as a fact finder just to find out the presence of certain systems or to gather simple data on energy use. And some businesses still relied on outsourcing its energy management responsibility.

Despite the abundance of opportunities, the consultants found that only a pre-existing concern for or capacity to engage in energy efficiency could easily lead to the businesses' adoption of recommended measures. In other words, there were very few elements of the consulting practice that played an active role in the businesses' decision to adopt recommended measures, which directly addresses **Question 3:** How do elements of energy efficiency consulting lead to the businesses' uptake of energy efficiency measures

post-audit? When consultants played a role in the decision-making process, it was mostly prompted by an existing interest or capacity for energy efficiency.

Question 2. How do consultants cope with these factors throughout the consulting process? In other words, what are the elements—such as doings, sayings and motivations—embedded in each stage of the consulting process?

Despite the insignificant influence of the consulting practice on businesses' decision to adopt measures, consultants revealed many elements of the consulting practice that were useful in getting businesses *closer* to adopting measures. These elements generally exist in five stages of the consulting process: initial contact, exploration, recommendations, persuasion, and director sign-off/decisions. These empirically defined stages may be a fluid cycle: sometimes consultants and clients go through the exploration, recommendation and persuasion stages several times to achieve an approved outcome.

In the initial contact stage, it is most effective to directly engage the primary clients. But some consultants had other consultants as contact clients, thus they haved to manage the interests of both types of clients. This demonstrates that consultants are almost always aware of the types of clients they are interacting with, as argued by Schein (1997).

In the exploration stage, the consultants were mainly interacting with the responsible clients, and asking for information based on a number of industry criteria—not merely ISO50001. They generally expressed a preference to interact with engineers because they could collaborate in the audit, mimicking the collaboration model of Pozzebon and Pinsonneault (2012). Interactions with other clients—including occupant clients—depend on the concern and capacity for energy efficiency, as influenced by the organisational culture and structure. Although it was harder to access occupant clients, consultants believed their interests—such as temperature comfort and air freshness—should be considered. If the organisational already expresses an interest in energy efficiency, the exploration is much more detailed, and thus likely to lead to a successful adoption.

To flip it around, consultants generally felt that they could only point businesses to recommended measures, but could not make them adopt them. One consultant said, "*You*

can bring the horse to the water but you can't make it drink." Their general strategy to effectively point out the recommendations was to construct a list of incremental recommendations that prioritise simpler measures over complex and expensive ones—in accordance with the energy efficiency hierarchy (Lutzenhiser 2014, p.145). In response to the issue of bounded rationality, they believe that the recommendations are the product of both their experience and clients' expectations.

In the persuasion stage, consultants highly value the approval of the responsible clients: they view responsible clients as those who can reiterate findings to the primary clients as well as actually implement the measures. Consultants want to give their expert information in a supportive and non-directive way, combining both the expert and process models of consulting. More characteristic of the process model encompassed teaching new tools and explaining audit processes to clients, which increased clients' own capacity to tackle energy efficiency. This is arguably the most important contribution of consultants to ESOS clients. Indeed, as most of them were not able to deliver the ESOS reports in-person to the primary clients, the most they could do was to advise the responsible clients.

Question 4. How do the more intangible elements of the consulting practice—such as consultants' general comments on energy efficiency policies—reveal the consultants' ideal form of energy efficiency consulting?

Among other things, consultants revealed that being a good observer and building good relationships with clients were embodied in the practice of consulting. But they generally did not believe that they should improve their approach to consulting given the low success rate. When they are dissatisfied with the clients' inaction towards energy efficiency, they believe it is the government that lacks the financial support and legal enforcement of energy efficiency policies. This defence practice of energy efficiency consulting suggests a misalignment between the habitus of energy efficiency consulting (of these consultants) and the field of the state. Furthermore, the consultants had indirectly conveyed that the ideal goal of energy efficiency consulting is to help

businesses adopt recommended measures, not to help businesses change their stance on energy efficiency.

All in all, these results corroborate with existing studies regarding the factors influencing businesses' approach to energy efficiency. And these factors are still the most important success factors in the adoption of recommended measures from ESOS: the mandatory audit and the resulting consulting practice are not the main factors. This conclusion suggests a further examination of mandatory audit policies or other types of energy efficiency consulting for comparison and validation. Future research could address other limitations of this study by incorporating a larger and more representative sample of consultants in terms of geographic regions, types of services covered, company sizes, etc. A study of the clients' side of the consulting practice could also be useful. Moreover, future research could pay a closer attention to the interactions between different factors of energy efficiency, and how these interactions could be addressed by the consulting practice.

Nevertheless, this thesis has successfully demonstrated that energy efficiency auditors do act in a consultative capacity: they are fully aware of the strategies that aid them in delivering their message as well as their consulting roles vis-à-vis different types of clients. Suffice it to say that energy efficiency consulting is not just about coming up with a list of recommendations; it is about the framing of energy efficiency, interacting with people, and bringing to light the intangible thing that is energy efficiency.

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Appendix

A.1 List of ESOS Registers

The list comes from the detailed ESOS guidance published by the Department of Energy and Climate Change and Environment Agency (2016). *The starred registers published randomised samples.

- http://esosregister.com/approved-lead-assessors/
- http://www.ecmk.co.uk/accreditation/esos/esos-lead-assessor-reg/
- *http://www.elmhurstenergy.co.uk/
- http://www.iema.net/iema-esos-lead-assessor-register
- http://www.nesltd.co.uk/content/nes-esos-lead-assessor-register
- http://www.theema.org.uk/the-ema-esos-lead-assessor-register/
- https://efficiency.energyinst.org/esos-lead-assessor
- https://www.cibseenergycentre.co.uk/online-registers/find-an-esos-lead-assessor.html
- *https://www.stroma.com/certification/find-a-member/
- https://www.the-ies.org/esos

A.2 Interview Invitation

Dear Sir or Madam,

My name is Joan and I am currently undertaking dissertation research for my master (MSc in European Spatial Planning and Environmental Policy) at Cardiff University. I found your email address through an ESOS-assessor registry because you may be a suitable participant in my research.

I am looking for:

- Energy efficiency practitioners whose work involves commercial buildings, preferably offices.
- Their efforts to help businesses with energy efficiency measures beyond policy compliance (e.g. getting ESOS businesses to take action to reduce energy consumption post-audit).

- I am interested in practitioners' specific actions and approaches, during all phases of the project (hiring, problem definition, identification of solutions, implementation, etc.).

What I need from suitable people:

- A discussion (approx. 30 min to an hour) about your work via skype or in-person if you live in Cardiff, Wales, sometime in April.
- Possibly some artifacts from your projects that I could use to supplement my research (e.g. your notes, an ESOS audit report template, communication with other actors, etc.)
- All information gathered will be handled in a confidential manner and you would be able to withdraw at any time.

If you are willing to take part in my research, please reply to this email at joanw0226@gmail.com with some possible appointment timeslots in the month of April.

I thank you in advance for your help in this matter. You will be contributing to a piece of research that helps to understand the energy efficiency industry in the UK, which is beneficial to practitioners, academics and policy-makers.

Sincerely,

Joan

A.3 Profile of Interviewees

#	Company Size	Additional Services	Years of Experience	# of ESOS Clients	# of Follow-ups	# of Post-audit Actions	Area
1	Self-employed	Low Carbon	Less than 1	3	3	0	South East
2	Small	Design, installation & maintenance	13	8	2	5	East Midlands
3	Large	Energy services team of a facilities management firm		5	1	1	London & nationwide
4	Self-employed	Safety & sustainability		30		1	South East
5	Small	Building services	10	13	2	2	East
6	Small/ Medium	Energy efficiency metering and retrofit products	8	7	5	5	Ireland

#	Size	Role					Region
7	Small	Environmental consultant	8	3	1	0	Yorkshire and the Humber
8	Self-employed	Renewable energy specification				0	West Midlands
9	Small	Energy procurement	27	30	10	10	North West
10	Small		13	10	10	7	North West
11	Large	Energy services team of a facilities management firm	3	5	1	1	London but nationwide
12	Self-employed		9	30			London
13	Small	Energy procurement	8	5	4	1	Wales
14	Self-employed	Surveyor	10	6	6	1	South East
15	Self-employed	Carbon	16	6	0	4	North West
16	Self-employed	Environmental management	10	2+	2	2	London

A.4 Interview Guide

Initial Questions	• Could you briefly describe your background, current job and company? • Could you generally describe your experience with ESOS? • Can you describe your ESOS clients? • Could you take me through a typical experience with an ESOS client, including your actions and routines?
ESOS Audits	• How is energy handled by the client? How does the organisation approach energy efficiency? • Do they own the building? Could you describe their building portfolio? • Did you rely on specific tools or approaches to conduct the audit? • How did you get the information you need for the audit? • What kinds of energy efficiency recommendations do you give? How do you determine them? • Do you identify recommendations based on your own ideas or the client's expectations? Or a combination? • How did you behave throughout the audit process?
People & Interactions	• Who do you interact with during an ESOS audit? • Who is interested in energy efficiency measures? How do they affect your work? • Were there any conflicting interests and opinions either between you and the client or amongst different actors within the organisation?

	• What other factors influence the audit results? Does the company's culture matter? • How do you communicate your findings and recommendations? • How does your relationship with the client evolve throughout the project? • What did you think your role was for the ESOS client? • How did the client learn from you? And vice versa?
Final reflection	• What are the duties and responsibilities of your job? • What is your own motivation or mission behind your job? • What do you like most about your job? • What do you dislike most about your job? • What do you wish you could change about your job or the energy efficiency consulting industry? • What are the most important skills or knowledge you need to engage with clients about energy efficiency? • Outside of the ESOS audits, how do you maintain these skills and knowldege?

A.5 Consent Form

Consent Form - Anonymous data

I understand that my participation in this project will involve conducting a semi-structured interview about my work, lasting approximately an hour. I understand that there may be a follow-up discussion and/or request for secondary data regarding my work. I understand that the interview may be audio-recorded.

I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason.

I understand that I am free to ask any questions at any time.

I understand that the information I provide will be shared with the research team or research supervisor and may be used in subsequent publications.

I understand that the information provided by me will be held totally anonymously, so that it is impossible to trace this information back to me individually.

I understand that, in accordance with the Data Protection Act, this information may be retained indefinitely.

I, _____(NAME) consent to participate in the study conducted by Joan Wang from the School of Planning and Geography, Cardiff University with the supervision of Oleg Golubchikov.

Signed (researcher/student): JOAN WANG

Signed (Participant):

Date: