

**ENTREPRENEURIAL MARKETING AND TECHNOLOGY ORIENTATION:
A CASE-BASED STUDY OF THE UK ENERGY SERVICE INDUSTRY**

by

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LIST OF ABBREVIATIONS

AAM	The American Academy of Marketing
BBC	British Broadcasting Corporation
BIS	Department of Business, Innovation and Skills
B2B	Business to Business
B2C	Business to Consumer
CESP	Community Energy Saving Programme
CHP	Combined Heat and Power
CO	Customer/Competitor Orientation
CRM	Customer Relationship Management
CTA	Construction Technology Assessment
DECC	Department of Energy and Climate Change
EC	European Commission
ECCP	European Climate Change Plans
ECO	Energy Contract Obligation
E-commerce	Electronic commerce
e-CRM	Electronic Customer Relationship Management
e-Marketing	Electronic Marketing
EM	Entrepreneurial Marketing
EMICO	Entrepreneurial, Market, Innovativeness and Customer Orientations
EMO	Entrepreneurial Marketing Orientation
EO	Entrepreneurial Orientation
EPC	Energy Performance Contracting
ESCos	Energy Service Companies
EU	European Union
e-WoM	Electronic Word-of-Mouth
FB	FaceBook
FIT	Feed-in- Tariff
GD	Green Deal
GDHIF	Green Deal Home Improvement Fund

GDP	Green Deal Providers
HECA	Home Energy Conservation Act
IO	Innovative Orientation
IT	Information Technology
JTB	Justified True Belief
KBV	Knowledge-based View
MO	Market Orientation
MT	Million Tonnes
NAO	National Audit Office
NASA	National Aeronautics and Space Administration
NEC	National Exhibition Centre
NHS	National Health Service
NPD	New Product Development
Ofgem	Office of Gas and Electricity Markets
PCN	Personal Contact Networks
RBV	Resource-based View
RHI	Renewable Heat Incentive
RHPP	Renewable Heat Premium Payment
SCOT	Social Construction of Technology
SEA	Search Engine Advertising
SEO	Search Engine Optimization
SMEs	Small-to-medium-sized Enterprises
SO	Strategic Orientation
SSK	Sociology of Scientific Knowledge
TAPE	Transformation, Assimilation, Prediction and Exceptionally
TEMP model	Technological Entrepreneurial Marketing Performance model
UK	United Kingdom
VC	Venture Capital
WoM	Word-of-Mouth

ABSTRACT

The aim of this PhD research is to address the role of Technology Orientation (TO) and Entrepreneurial Marketing (EM) in new firms within the energy service industry. It mainly focuses on how Entrepreneurial Orientation (EO), Market Orientation (MO) and TO (inclusive of digitally enhanced marketing activities) contribute towards young firms' EM performance.

The Technology Entrepreneurship Marketing and Performance (TEMP) model is conceptualised and developed using extant theory and mixed qualitative methodologies including semi-structured interviews and observational web-based research. Findings identified several themes identified in earlier EM literature and five new emerging themes that offer insights into the potential relationship between EO, MO and traditional (administrative) marketing and, digital marketing. From this, the research conceptualizes technology driven marketing techniques as being a significant part of a firm's TO and this implicitly compliments the entrepreneur's ability to market the firm, products and services to customers.

Implications include the implicit value of a combined EM approach which includes TO and, widening the research agenda to include new policy driven SMEs in 'green' technology industries.

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Chapter One: Introduction

1.1 Introduction

This chapter presents an introduction for this thesis entitled ‘Entrepreneurial Marketing and Technology Orientation: A Case-based Study of Young Ventures in the UK energy service industry.’ Research began in September 2013 and was motivated by the ongoing debate about Technology Orientation (TO) in the context of EM theory. There are two major debates about current recognition of the term TO: (1) TO is currently identified as a sub-dimension under Strategic Orientation (SO) to support the innovation and technology involved in decision-making. However, the question is how does TO interact with EO and MO in the context of EM (Zhou et al., 2005; Zhou, 2015; Astini and Tafiprios, 2017); hence (2) there are growing calls in the literature for further EM research of innovative technologies. For example, the study of digital marketing, e-CRM, social media and mobile marketing. Currently, the most popular adopted TO definition (Gatignon and Xuereb, 1997) only focuses on productive technology for innovation. Therefore, it is important to investigate more widely, the role and definition of TO in the energy service industry context, where both services and products require an innovative approach to marketing.

This research is also motivated by calls from marketing researchers (Painuly et al., 2003; Bertoldi et al., 2006; Shaltoni and West, 2010) of energy service (also known as green energy) industries. Currently, very little research is related to marketing or entrepreneurial marketing with the exception of Goldman et al. (2005) and Painuly et al. (2003), has been carried out in the energy service industry sector. Yet, firm in the energy service sector face rapid changes in an uncertain environment. Small firms especially are unlikely to use traditional marketing methods to market their products and services, identify market opportunities and understand customer needs as they have limited resources (O'Dwyer et al., 2009; Cruz-Cunha, 2010).

While most entrepreneurs focus on the NPD and innovation process and prefer to use advanced marketing technology they excel in, such as Facebook, to seek market opportunities (Handayani and Lisdianingrum, 2011). Also, entrepreneurs of green energy young ventures have to make a decision of using either 'technology-driven' or 'market-driving' marketing activities to meet customer needs (Schindehutte et al., 2008) and where advantages using effective digital marketing may overcome some of the associated the 'product-customer- needs' relationship.

EM researchers (Miles et al., 2015; Fillis et al., 2017) acknowledge that entrepreneurs prefer to use the 'technology-driven' marketing activities because most of them excel in various technologies. However, these technologies they excel in belong to productive

and innovative technologies and only few of these technologies can be transformed for a marketing purpose (Sürer and Mutlu, 2015). Namely, entrepreneurs need to use further technology, such as digital marketing technology, to improve their marketing activities and engage with the consumer. Therefore, this research attempts to address this gap that few research on the energy service industry and firm. The EM research domain offers a platform of research with which to investigate innovation, entrepreneurship and marketing as closely associated themes in the existing literature (Hills and Hultman, 2008).

This chapter is organised as follows:

- Section 1.2 discusses the research topic of interest; TO, in relation to the EM field and outlines the research aims, question and research objectives.
- Section 1.3 states the rationale for this research.
- Section 1.4 explains the research methodology and thesis structure.
- Section 1.5 proposes the thesis contributions from both academic and practical aspects.
- Section 1.6 presents a conclusion of this chapter.

1.2 Research Question, Aim and Objectives

1.2.1 Key Terms

A variety of prior studies have explored Technology Orientation (TO) and its focus on the degree of technology used in new product development (NPD), innovation along with new ideas in decision-making support (Gatignon and Xuereb, 1997; Zhou et al., 2005; Miles and Darroch, 2008). In these previous research, a technology-orientated firm meant that its founder preferred to use advanced technologies for NPD and to solve problems using technology-oriented solution (Zhou et al., 2005; Hakala and Kohtamäki, 2011). Despite TO being discussed both the innovation literature and with regard to strategic research (Zhou et al., 2005; Hakala and Kohtamäki, 2011; Sürer and Mutlu, 2015; Lee et al., 2016), few rigorous studies have investigated TO from the marketing perspective.

However, along with the development of Information Technology (IT) and the Internet, marketing technologies (for example digital marketing) are becoming increasingly important for gathering market knowledge, developing understanding of customers/markets and for research and development for NPDs. All these activities support the survival and growth of the new ventures (Enerson, 2014; Copulsky et al., 2017). Kotler et al. (2016) describes marketing technology as being consistent of marketing knowledge, tools and platforms adopted by a firm to be aware, meet and

satisfy customer requirement. These marketing technologies allow the entrepreneurs to collect and analyse the latest data about customer requirements and market changes, introduce advanced technologies and knowledge from other industries and, support the NPD and innovation process (Uslay et al., 2004; Hasani et al., 2017; Patrutiu-Baltes, 2017).

The nature of marketing technology indicates that there is likely to be an association between marketing technology and TO. Additionally, Trainor et al. (2011) suggest that a firm's TO should involve IT and e-marketing as their research results show TO and also e-marketing impacts positively on firm performance and customer engagement. Therefore, this research seeks to redefine TO by considering marketing technology as an indispensable component to have better understandings of the new ventures' marketing activities.

This research defines TO as: **the use of sophisticated technologies in new product development and innovation, proactively creating new product ideas; it also denotes the use of innovative marketing technologies as technical solutions to understand and meet consumers' new needs.** The new definition of TO introduces several advantages to emerging marketing research, such as Entrepreneurial Marketing (EM). First, TO now eliminates the boundaries among different technologies, such as product technology, decision support technology and marketing technology. Therefore,

a technology-oriented firm uses TO (marketing technology) as an indicator to collect customer requirements and market opportunities for NPD (Lichtenthaler, 2016).

Kasim and Altinay (2016) note that the adoption of integrated technologies allows a technology-oriented firm to reflect the philosophy of ‘technology push’ and ‘customer satisfaction’. Secondly, a new definition of TO may further encourage entrepreneurs to take on fresh ideas about state-of-art technologies from other industries to create new marketing competition for young ventures (Kasim and Altinay, 2016). For example, this research found that several young technology-oriented ventures in the UK energy service sector have used state-of-art technologies from the manufacturing industry (Rolls-Royce engine cooling technology) and AI computer industry (smart energy monitor systems).

Finally, TO has a significant effect on the survival and growth of young ventures by playing a bridging role between market activities, entrepreneurial orientation and customer requirements (Im and Workman Jr, 2004; Hakala and Kohtamäki, 2011; Lichtenthaler, 2016; Rezazadeh et al., 2016). Prior research (Hakala and Kohtamäki, 2011; Kasim and Altinay, 2016) have observed that, with the support of marketing technologies, entrepreneurs use TO to identify the firms’ advantages and disadvantages and collecting customer requirements and market opportunities and determining changes in external environments, such as policy and venture capital.

Prior literature has also highlighted that there should be a close relationship between TO and EM theory (Morrish and Morrish, 2011; Toghraee et al., 2017). Foxon et al. (2010) have found that most innovations and NPDs happening in the energy service where young ventures express radical innovation and where radical innovation results in the differentiation of EM activities for young ventures (Morrish and Morrish, 2011). Furthermore, several literature (Schindehutte et al., 2008; Rowley and Jones, 2011; Jones et al., 2013b) have identified dimensions of “networking” and “partnership” as valuable. Therefore, TO has a relationship to EM activity since they have several common dimensions, such as innovation, network and partnerships.

Entrepreneurial Marketing (EM) is a cross-disciplinary subject that has dominated the interface between entrepreneurship and marketing for the past 35 years (Hills and Hultman, 2008). The American Marketing Association (AMA) introduced and driven various scholars who have entrepreneurship and marketing knowledge to explore EM knowledge at its annual research meeting in 1982 (Miles et al., 2015). Since then, a growing number of marketing and entrepreneurship symposiums and meetings began to include EM as an emerging topic (Ramos, 2016). For example, the AMA decided to add the EM track into the Special Interest Group (SIG) (Rowley and Jones, 2009). In the UK, the Academic of Marketing (AM) conference has explored the EM topic since 1995 (Rowley and Jones, 2009), while the British Academy of Management also investigated EM from the entrepreneurship perspective since 2000 (Ramos, 2016).

Several scholars used marketing in the SME sector as the starting point of EM research, treating EM as a critical component of SME marketing (Rowley and Jones, 2009). For example, Stokes (2000) has identified that successful entrepreneurs have implemented the “unconventional marketing” method, such as word-of-mouth in SMEs and have emphasised the values of innovation and informal networks. Bjerke and Hultman (2004) have demonstrated the impacts of entrepreneurial characteristics on entrepreneurs’ operational and marketing activities. Furthermore, EM is seen as a value co-creation process that provides additional value for customers and identifies further opportunity and customer for the entrepreneur in SMEs (Bjerke and Hultman, 2004). Hills and Hultman (2008) have emphasised the difference between EM and traditional marketing by understanding the relationship between EM activity and firm performance. This research encouraged several researchers to investigate EM as an innovative marketing discipline and develop the definitions of EM from different perspectives.

EM is defined as an entrepreneurial spiritual and orientation that identifies and creates perceived customer value by identifying opportunities in the marketplace, resource leveraging and venture management innovation (Morris et al., 2002; Hills et al., 2009). Morris et al. (2002, p.5) keystone research defines EM as “*the proactive identification and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to risk management, resource leveraging and value creation.*” Rowley and Jones (2009) note that SME marketing is a unique classification

of EM. In their study they note that a number of qualitative studies focus on the growth of small ventures in their early stage, EM behaviour and innovative marketing approaches (Kraus et al., 2009; Hills and Hultman, 2011b; Bjerke and Hultman, 2013).

One key point of relevance to this research is the contribution of EM theory to the small business sector in terms of entrepreneurs as the core competitive force of growth, with person-to-person social communications being crucial to business success (Hills et al., 2009). Additionally, some of the most common characteristics of EM include the innovativeness, risk-taking and proactive behaviour (Carson, 1990; Bjerke and Hultman, 2004; Rowley and Jones, 2011) likely to be necessary for the challenges presented by the sustainable energy industry.

1.2.2 Research Aim, Question and Objectives

The overarching aim of this research is **to examine how Entrepreneurial Orientation (EO), Market Orientation (TO) and TO (inclusive of digital enhanced marketing activities) may contribute towards young venture's EM performance.**

Consequently, this research plans to identify the key dimensions that involve TO in the EM activities of the young venture. In addition, there is great interest in understanding the process of EM activities from the entrepreneur's creation of the idea to the execution of the entrepreneurial marketing activity (Key Manesh, 2012). Therefore, the researcher has used the Knowledge-based View (KBV) that considers the young venture's EM

activities as the transformation of knowledge, while the interaction between TO, EO and MO means various relevant knowledge is combined which may transfer into EM practice. Ultimately, this combined knowledge will assist the entrepreneur in facilitating the young venture's marketing performance.

Consequently, this research uses constructivism as its ontological position and interpretivism as the epistemological position in terms of the KBV research view. Next, the researcher will make the decision to use the case study as the research strategy since this research focuses on 'how' and 'why' questions of EM phenomena from perspectives, including personal traits, use of innovative technology, marketing, customer needs and external environment. Therefore, the case study uses a comprehensive view of the understanding and generation of the Technological Entrepreneurial Marketing Performance (TEMP) model as an EM process.

Based on earlier discussions in this chapter, the research question is as follows:

What is the role of TO and EM in young ventures within the energy service industry?

The research question can be divided into the three following questions:

- What is the role of TO in relation to EM theory?

This is a fundamental question which aims to understand what TO dimensions are used by entrepreneurs in their firm and marketing activities and, whether TO dimensions exist in EM knowledge or not. This is a critical follow-up question for this research because it can provide a comprehensive understanding of what TO should encapsulate in the internet technology age within the energy service sector. In addition, the subsequent research question below provides a valuable opportunity to redefine TO by including the role of innovative marketing technologies. A new understanding and definition of TO will enable the researcher to understand the overlaps of concepts related to TO and EM.

- How do entrepreneurs use TO and EM with respect to the marketing activity of young ventures?

The following question aims to develop a further understanding of TO and EM in the case participant firms. Prior marketing researchers (Hakala and Kohtamaki 2011; Altinay, Madanoglu De Vita 2016; Lichtenthaler 2016) have identified the productive technologies of TO in relation to EO, MO and IO within EM knowledge. However, the researcher has also attempted to investigate whether and how TO (inclusive of innovative marketing technology) is related to EM. By understanding the potential relationship of TO and EM, this thesis develops an in-depth understanding of both roles

of TO and EM in the marketing activities of young ventures in the energy service industry.

- What contributions do EM and TO make in conjunction to a young venture's marketing performance?

This question attempts to understand how entrepreneurs use various technologies to facilitate the marketing performance of young ventures. Several marketing researchers have investigated the impact of a specific innovative marketing technology, such as digital marketing orientation (Mutlu and Surer, 2016), on the small ventures' marketing performance. However, very little research has investigated the impact of TO on the integration of various productive and innovative marketing technologies on young ventures' EM performance. This question helps the researcher to identify dimensions from literature and empirical research data with the aim of constructing all the existing and emerging dimensions into the TEMP model (Figure 4.1).

Several research objectives have been developed to support the research question:

- To provide an overview of UK green energy policies and schemes to develop a further understanding of the energy service industry and, to explore what external environmental factors may impact on ESCOs' marketing performance;
- To investigate using key participant interviews to identify which dimensions may relate to the entrepreneurial marketing activities visible in this research context;

- To carry out secondary data collections and analysis; to populate the existing dimensions of TEMP model further and to identify any new emerging dimensions;
- To carry out further firm participant interviews with founder-owners/entrepreneurs by using card-based semi-structured interviews to populate the TEMP model; to develop descriptors for each dimension of the TEMP model; to acquire insights into each dimension of the TEMP framework and to corroborate the dimensions within both Green Deal based and non-Green Deal based young ventures.

1.3 Energy Service Industry

The energy service industry is an emerging industry that provides energy efficient and sustainable services and products to improving the environments by facilitating energy consumption and reducing carbon emissions. The first group of Energy Service Companies (ECOs) who provide sustainable and green energy services founded in the 1970s and aiming to reduce the air pollution and fog weather caused by heavy use of coal since the Second Industrial Revolution (Fouquet, 2016). The former UK Prime Minister Margaret Thatcher emphasised the significance of environment protection and developed several green energy policies and schemes to reduce carbon emissions, increase the use of renewable energy and guide the development of the energy service industry (Bertoldi et al., 2006).

Consequently, many entrepreneurs and other founder-managers have joined this industry to provide various businesses and services, such as renewable heating products, consultancies, green energy service financial solutions and energy service implementation training (Sorrell and Nolden, 2013). The UK energy service industry has made an impressive achievement on environment protection. The usage of coal had fallen sharply from 33% in 2004 to 9% in the UK energy consumption in 2016 (Department of Energy & Climate Change, 2016).

Meanwhile, the contribution of renewable energy, such as wind energy, water and tide and solar energy, reached 24.9% as the supply of renewables for 4.5 million UK resident houses in 2017 (Department of Energy & Climate Change, 2016). Therefore, the UK energy service industry has a huge potential to provide green and renewable energy for 140 million housing properties and, create 48,000 job positions by 2020 (Fouquet, 2016). However, Bertoldi et al. (2006) claim that the development of the UK energy service industry as well as green policy faced several challenges. One challenge is the low survival rate of young ventures in UK energy service industry.

Although the UK has continued to be at the frontier of energy efficiency and carbon reduction for European Union members since 1988, very little research has focused on the UK energy service industry from marketing prospectively. Compared with that, a number of academic studies of the energy service business in other EU countries have been published, such as the ESCos business model in Finland (Okkonen and Suhonen,

2010; Son et al., 2010), one showing how Germany government has acted to have an impact on the development of the energy service industry (Kannan and Boie, 2003; Walsh et al., 2006) and a comparison of studies between Finland, France, Germany and Italy (Vine, 2005; Thollander et al., 2013).

Furthermore, government laws and industry reports have preferred to collect the data expressing energy service performance from large service companies and energy suppliers' subsidies. However, researchers have seldom focused on the contributions achieved by small-to-medium-sized energy service firms. However, the number of small-to-medium-sized in the UK has reached 480 in 2009 (Ofgem, 2011) and they should offer further contributions than large scale ESCos. Therefore, this research has decided to investigate, more specifically, the marketing performance of young ventures and small-and-medium-sized enterprises (SMEs).

Since October 2012, an increasing number of UK energy service young ventures have been founded since the UK government developed the newest green and renewable energy policy, Green Deal. Green Deal encourages entrepreneurs devoted to improving the UK environment and energy efficiency to provide renewable products, services and financial solutions to more UK private residential properties outside the energy efficiency services of the large energy supplier corporations, such as E.ON, Scottish Power and British Gas (NAO.org, 2016).

Hannon (2015) states that Green Deal aims to control the ‘quality of energy’ and increase the number of the ‘energy efficiency in building’ profiting population in the residential housing sector. Consequently, an increasing number of ESCo young ventures have been founded and most of them have implemented advanced productive technologies in NPD processes and use multiple marketing approaches, such as administrative marketing, e-marketing and social media marketing, to improve the marketing performance. As such, this context provides a rich context to investigate how these young technology-oriented ventures survive in the traditional industry, that is the UK energy service industry. Furthermore, research will seek to gain a further understanding of what roles of the EM and TO play in the UK ESCo young ventures and how this understanding help the young ventures survive.

1.4 Research Rationale

The rationale for conducting this research is threefold: first of all, there are a growing number of EM studies proposing that the role of innovative technologies has a positive impact on a firm’s performance. Despite innovative technologies being labelled differently, such as ‘e-marketing orientation’ (Shaltoni and West, 2010; Sürer and Mutlu, 2015) and ‘digital marketing orientation’ (Avramo, 2016), the essence of their research objects is technology, specifically marketing technology. There are calls for

further research of TO from EM researchers, while further investigation of the role of technology enhanced marketing and TO requires further examination.

Secondly, there is a lack of suitable frameworks related to technology and entrepreneurial marketing with which to investigate EM in start-ups or other young firms. Although there are a few notable frameworks in the EM literature, such as Rowley and Jones (2009)'s EMICO framework and Whalen et al. (2015)'s entrepreneurial contingency framework, there is a lack of frameworks or models which focus on technology driven marketing and EM in the context of SMEs.

The final rationale for this research is that conducting this TO centred research not only extends to EM knowledge academically but also is beneficial to entrepreneurs and green energy policy-makers. This may encourage further qualitative and quantitative EM in this area and provide useful advice for governments and policy-makers.

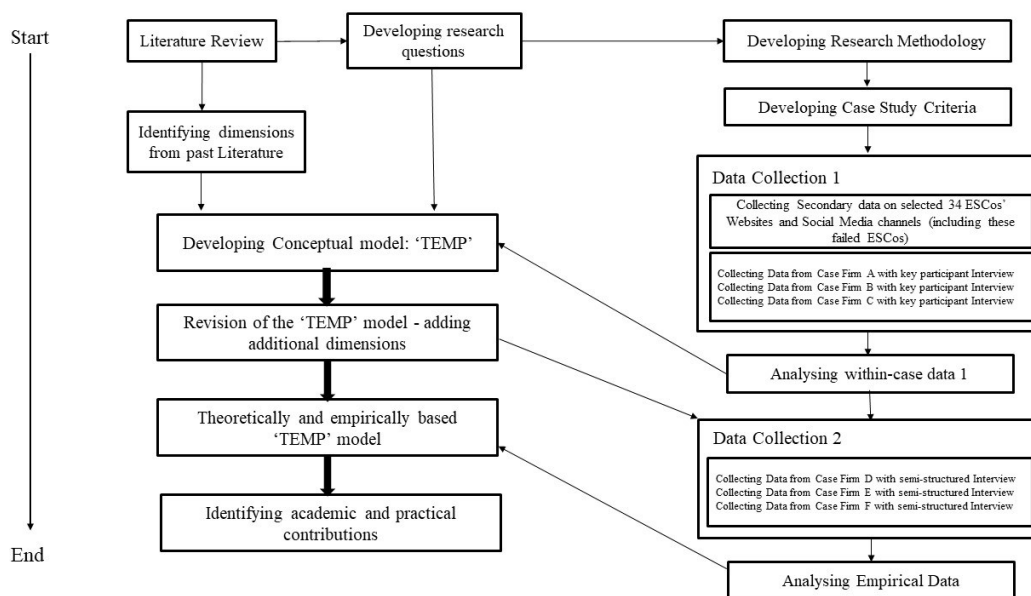
1.5 Research Design and Methodology

1.5.1 Research Design

To understand the relationship between TO and EM and then explore a combined impact of EO, TO and MO on firm's marketing performance, this thesis uses an

integrative, qualitative research design (Carson et al., 2001; Yin, 2013). Following methodological suggestions of research design development from Yin (2013), Bryman and Bell (2011) and Eisenhardt (1989), the researcher develops a ‘roadmap’ to describe the research process from literature review to data analysis (Figure 1.1).

Figure 1.1 'Roadmap' of the Research Design for this Thesis



In Figure 1.1, the first stage was to review the related literature, including the SME marketing, EM, EO, MO, SO and TO literature, to develop the research question. Literature was identified and collected by using keywords including ‘EM’, ‘EO’, ‘TO’, ‘MO’, ‘ESCos’ and ‘Green Deal’. EM was identified as having a positive impact on marketing performance, largely by studies which considered the effect of one aspect (orientation), such as EO, MO or SO or a combination of these orientations (Grinstein,

2008a, b). However, few studies have investigated the relationship between EM and marketing performance from a TO perspective, despite firms requiring to become technologically adept at technology driven marketing. Therefore, the researcher developed research question to enable deeper understanding of TO, EO, MO and their overlaps and also the role of the entrepreneur and the impact of all of these aspects on firm marketing performance. The literature review also identified a number of dimensions that are used to develop a conceptual framework.

The case study method including a sample of small firms in the sustainable and green industry sector was the chosen research strategy. The case study began with data collection for the first round from both pilot interviews and 34 ESCos' websites and their social media channels. The findings of the first-round data collection examined the existence of TEMP dimensions identified from the literature, while identifying emerging dimensions for expanding the TEMP model in an iterative process, using the 'data collection 1' data, which included data from participant firms A, B and C and the internet based secondary data.

Then, the revised TEMP model needed to be applied to further selected cases (participant firms D, E and F) to understand the relationships among dimensions further and to enhance its rationale and validation. Therefore, the researcher collected the second round data with semi-structured interviews (data collection 2). The findings of

the semi-structured interviews have further informed the dimensions of the TEMP model and identified a number of contributions from both academic and practical viewpoints.

1.5.2 Thesis Structure

This PhD thesis structure has six chapters (Table 1.1).

Table 1.1 Thesis Structure

Chapter No.	Titles and Contents
Chapter One	Introduction
Chapter Two	Literature Review
Chapter Three	Methodology
Chapter Four	Reported Findings of Online Non-participant Observation and ESCos Entrepreneur Interviews
Chapter Five	Discussion
Chapter Six	Conclusion

Chapter One provides an introduction for the whole thesis. This chapter provides the thesis title, research question and research objectives, a brief introduction of key concepts, including EM and TO and the methodological design. Furthermore, it explains the research rationale, background and construction of this thesis. The chapter

proposes a number of research contributions, both academic and managerial and policy implications.

Chapter Two discusses key theoretical concepts which include SMEs marketing, EM, EO, MO, Strategic Orientation (SO) and TO to identify research gaps and to develop appropriate research question. It provides the theoretical foundation for this thesis. The chapter then explains how the dimensions for the Technological Entrepreneurial Marketing Performance (TEMP) model are identified.

Chapter Three explains the methodological standpoint of the researcher and that the epistemological viewpoint is one of interpretivism and its ontological view is constructivism, while explaining that the nature of the research is qualitative. This chapter next introduces the case study as its research strategy which includes two embedded data collections with participant firms and also secondary data collection from web-based analysis of websites and social media of a wider sample of ESCos. Data collection include online non-participant observation, key participant semi-structured interviews and also card-based semi-structured interviews. The card-based method within semi-structured interviews gives the interview participants a visual cue to guide the data collection without interfering with the researcher. This chapter also describes several firms participated in interviews that consolidate the dimensions of the TEMP model.

Chapter Four discusses the main findings of the case study in two parts. The first part of this chapter focuses on the findings from the secondary data collected from online non-participant observation with the 34 selected ESCos. The sources of secondary data include website context, Facebook pages, Twitter messages and conversations, LinkedIn pages and a third-party company information check website, Company House Beta. The findings of the online non-participant observation demonstrates evidence that the UK entrepreneurial young ventures are technology-oriented that (1) use advanced technologies and introduce further technological superiority from other industries in the NPD and innovation process and, (2) also use various marketing technologies, such as the website, Facebook and LinkedIn, to access data about customer requirements and market changes, identifying opportunities for business and partnership and exploring new ideas and technical knowledge that may trigger radical innovation for NPD and innovation.

However, the findings of the online non-participant observation show limited evidence concerning the relationship between entrepreneurial characteristics and activities and use of TO. This is because it is more likely to be evidenced from dialogues with entrepreneurs. Therefore, the second part of this chapter presents further evidence from several interviews. The second part of this chapter discusses the findings from the key participant interviews and card-based semi-structured interviews. The findings from interviews generate the final version of the TEMP model (Figure 4.1, page 318) and

populate the model with young ventures for extended knowledge about energy service sector.

Chapter Five is the discussion chapter, presents the key differences and emerging dimensions from both web-based secondary data and semi-structured interviews from an earlier chapter (Chapter Four). Several major emerging dimensions including 'Search Engine optimisation', 'International Marketing', 'Market Information', 'Green Policy and Sustainable Initiatives' and 'Direct Marketing' are identified from the participant firm interview. Apart from demonstrating the dimensions that identified from the previous literature, emerging themes enrich the dimensions and increase the validation of the TEMP model. The TEMP model has been revised in terms of these new understanding to become a more general model that should be suitable for more entrepreneurs in other industries.

Chapter Six reviews the earlier seven chapters to develop conclusions for this thesis. Therein, an overview of this thesis design and findings are presented to demonstrate that entrepreneurs implicitly use TO in order to facilitate the firms' marketing performance and also use their inherent entrepreneurial characteristics and clear market oriented aims together. In addition, the development of the TEMP model has created new knowledge that extends EM from a technology perspective. Finally, recommendations for future EM research are also proposed.

1.6 Research Contributions

This thesis contributes to the development of EM theory in several ways, as follows:

- First, it affirms and extends the study of TO in relation to EM studies. The term ‘technology’ means not only productive technology used in innovation and NPD, but also digital technology, communication and other similar digital technologies. The thesis findings suggest that entrepreneurs tend to use several technologies as an integrated component of the EM process. Thus, this also explains the reason why different technologies, such as e-marketing, e-CRM, digital marketing and mobile marketing, should be considered as components of TO, rather than developing more new orientations, such as an e-marketing orientation.
- Secondly, this thesis contributes to the construction of EM theory by developing the TEMP model that examines behavioural activities in respect to EO, MO and TO that constitute the interface of EO and MO in the context of technology oriented young ventures. The TEMP model may provide a solid guidance for EM quantitative research in the future. The findings emphasise the importance of ‘networks and partnership’ and the organisational learning ability to adopt TO effectively.
- Thirdly, very little marketing research uses the ‘green’ energy industry or sustainable energy firm to investigate technology-oriented theory.

- Fourthly, there is very little qualitative research focused on the marketing activities of young ventures. This research uses a case study research approach with a mixed qualitative research methodology, which include online non-participant observation and card-based semi-structured interview to develop a thorough-understanding of the comprehensive phenomena of young ventures in the case study research context of the UK energy service industry.

Furthermore, the thesis provides further practical, managerial contributions for entrepreneurs, governments and policy-makers. By adopting a TO within the entrepreneurial marketing process, the entrepreneur is enabling the transformation of an idea into a product with the inclusion of a marketing solution and also, leveraging finance and resource from networks, while reducing the unnecessary cost of using an inappropriate marketing method. For policy makers, this thesis explains several reasons for failures of the current green and sustainable energy policies from both the market and entrepreneurs' perspectives (see Chapter Three). Additionally, the card game uses dimensions as keywords to collect enrich data about previous green policies, such as Green Deal, to help policy-makers to create a better energy efficiency policy in the future.

1.7 Conclusion

This chapter introduces this PhD research to provide an overview of all the important findings presented by the thesis. It has explained the research question and research objectives with a brief introduction of the key theoretical underpinning concepts which include EM and TO.

Next, the chapter presents the thesis rationale: few previous EM researchers have discussed digital and marketing technologies within TO studies and there has been a lack of a suitable entrepreneurial marketing and technology models to guide more qualitative and quantitative studies to examine the relationship between EM knowledge and innovative technology. Furthermore, an introduction to the research background of the thesis has proffered reasons why UK energy service sector is largely constituted by young entrepreneurial ventures and ESCOs who operate in an uncertain environment.

Subsequently, a summary of the research design and a construction of the thesis chapters has been discussed. Contributions are then proposed to emphasise the importance of this research.

Chapter Two: Literature Review

2.1 Introduction

This chapter presents the related literature used to investigate Technology Orientation (TO) and Entrepreneurial Marketing (EM) in the small-to-medium-sized enterprises (SMEs) context. By reviewing the existing literature, this chapter aims to develop further understanding of TO and EM and to propose a conceptual framework, the Technological Entrepreneurial Marketing Performance (TEMP), on the basis of evidence in the prior literature.

The chapter is organised into three parts. The first part (Sections 2.2 – 2.5) discusses EM theory, which begins with reviewing SME marketing and entrepreneurship research where past scholars agree that EM studies are to be found at the interface between marketing and entrepreneurship (Bjerke and Hultman, 2004; Hills et al., 2008).

The first part of the chapter also examines EM research from the orientation view which refers to the firm's activity and manager's behaviour involved in marketing action (Morris et al., 2002; Rowley and Jones, 2011), such as Strategic Orientation (SO), Entrepreneurial Orientation (EO) and Market Orientation (MO). By reviewing the findings of past EM scholars, the first part of this chapter recognises that entrepreneurial characteristics, such as pro-activeness, risk-taking and innovativeness, and several

orientations, including EO, MO and CO, are related to SO (Hill, 2001; Hills and Hultman, 2008; Morrish and Morrish, 2011).

The second part of this chapter continues to identify and discuss TO as another key component of SO with technology driven young ventures from the knowledge-based view (KBV) (Section 2.6). TO has been described as a cluster of productive and innovative technologies that assists in new product development and organisational decision-making since Gatignon and Xuereb (1997) defined it in two decades ago. However, there is a paucity of TO research investigated the contributions of innovative marketing technology, even though the use of innovative technologies, such as digital marketing and mobile marketing have been observed among various technology-oriented firms. This thesis seeks to explore the role of TO and to re-define what TO is. The definition given twenty years ago may now be inappropriate, because technology has developed rapidly and diversely. The second part therefore identifies research gaps by reviewing TO literature along with current EM research. The final section (Section 2.7) describes the development of the conceptual framework, TEMP model.

This research uses the knowledge-based view (KBV) to investigate EM. The resource-based view (RBV) assumes that a firm is a collection of resources and unique resources are the source of the core competitiveness for a firm (Alvarez and Barney, 2004). On the other hand, KBV researchers see a firm as a knowledge processing system, and

maintain that that the tacit knowledge which exists in human actions and which has a close connection to social environment provides a firm with more competitiveness (Eisenhardt and Santos, 2002; Hallbäck and Gabrielsson, 2013).

According to the KBV, EM is a knowledge transforming process in which tacit knowledge may be created as an entrepreneurial idea and then be transformed into new product or service by adding more explicit knowledge, such as entrepreneurial characteristics, experience and marketing technologies. Finally, knowledge will pass between the firm and its customers through identification of new opportunities. Furthermore, adopting KBV helps to overcome the drawbacks of RBV, such as ignoring external environmental changes.

The following sections discuss the relevant literature as follows:

- Section 2.2 discusses the literature relating to EM to demonstrate understanding of its development, definitions and characteristics over the past 30 years.
- Section 2.3 continues to discuss the literature that relates to SME marketing and entrepreneurship.
- Section 2.4 reviews SO with its components, EO and MO, in the context of EM related to this research. This thesis examines the orientations specifically related to EM and SME marketing and the study of technology-driven marketing.

- Section 2.5 discusses the TO literature mainly from technology driven SME research. This section also considers the more recent TO studies which relates to the EM.
- Section 2.6 identifies several dimensions from both EM and TO literature and then develops the Technology Entrepreneurial Marketing Performance (TEMP) model presenting the rationale for this model.

The structure of the literature review is shown in Table 2.1:

Table 2.1 Structure of the Literature Review

Section	Content
Entrepreneurial Marketing (EM) Theory	<ul style="list-style-type: none"> • An overview of EM • EM definitions • Differences between Traditional Marketing and EM
Theoretical Foundations of EM	Entrepreneurship <ul style="list-style-type: none"> • Entrepreneurs and SME owner-managers • An overview of entrepreneurship studies SMEs and SME marketing <ul style="list-style-type: none"> • SME marketing: characteristics and limitations

	<ul style="list-style-type: none"> Marketing methods used in SMEs: Traditional and Innovative Marketing
EM Orientation Research in the Context of SMEs	<ul style="list-style-type: none"> Entrepreneurial Orientation (EO) Market Orientation (MO) Innovative Orientation (IO) Customer/Competitor (CO) Strategic Orientation (SO)
Technological Orientation (TO)	<p>Technological Orientation (TO)</p> <ul style="list-style-type: none"> TO Definitions TO in new product development and innovation Digital marketing Rationale of TO in EM
Proposed Conceptual Framework	<ul style="list-style-type: none"> Research question, aims and objectives Conceptual Framework: Technological Entrepreneurial Marketing Performance (TEMP) model

2.2 Entrepreneurial Marketing (EM) Theory

2.2.1 An overview of EM

Entrepreneurial Marketing (EM) is a cross-discipline theory at the interface of entrepreneurship and marketing. EM theory posits that new young firms may increase their rate of survival and growth by investing in entrepreneurial actions (Gilmore, 2011; Rowley and Jones, 2011; Fillis and David Higgins, 2015). The discipline was initially described by the American Academy of Marketing (AAM) in the 1980s (Rowley and Jones, 2009; Morrish et al., 2010). EM examines entrepreneurship from a marketing perspective and is defined as a spiritual orientation that identifies and creates perceived customer value by identifying opportunity in the marketplace, resource leveraging and venture management innovation (Morris et al., 2005; Hills et al., 2008).

Rowley and Jones (2009) note that SME marketing is a key classification of EM since the launching processes of young ventures involve entrepreneurs and entrepreneurial activities which assist young firms in surviving and growth. It should be noted that EM has also been identified in the business development and marketing actions of large companies (Miles and Darroch, 2008; Gilmore, 2011). However, this research study centres on EM theory in SMEs context being that the focus of study are small young ventures.

Hills and Hultman (2011a) describes EM as a research discipline that investigates entrepreneurship knowledge from marketing perspectives. Stokes (2000) finds that the success of a new venture needs the entrepreneur to use ‘unconventional’ marketing method and entrepreneurial behaviour to help them to understand the marketplace and facilitate marketing performance. Entrepreneurs are transformative leaders who prefer to deliver their opinions as ‘commanders’ and control the behaviour of employees (Hill and Wright, 2000). The field of research has subsequently expanded to examine EO and its characteristics at firm-level (Hills and Hultman, 2011b), the similarities between entrepreneurship and marketing (Hills et al., 2008) and the use of innovation and innovative approaches to create non-traditional marketing consequences, such as time-efficient and cost-efficient, additional value and opportunity identification (Lumpkin and Dess, 2001; Miles and Darroch, 2008; O’Dwyer et al., 2009). A growing number of EM studies in the SMEs context investigate several issues, including customer identification and customer relationship management, decision-making support, factors deciding firm performance and the use of innovation and technology (Hills et al., 2008; O’Dwyer et al., 2009).

Furthermore, previous EM studies discuss entrepreneurial characteristics and confirm that entrepreneurs are business people who have certain personal traits or characteristics, including the ability to proactively recognise or create opportunity, innovativeness and take risks (Hills and Hultman, 2011a; Bjerke and Hultman, 2013). Opportunity

recognition is a critical theme in the entrepreneurship and the EM literature as well as the creation of new opportunities. Researchers maintain that successful entrepreneurs have the ability to perceive opportunities where others identify problems and they see solutions resulting in new opportunities (Hills and Hultman, 2013; Fillis and David Higgins, 2015). Furthermore, several EM researchers have recently emphasised the positive impacts of networks, entrepreneurial resources, marketing capacities and digital marketing activities (Kilenthong et al., 2016; Martin and Javalgi, 2016; O'Cass and Morrish, 2016). These researchers have investigated SMEs' marketing issues from 'the four research perspective' of the Charleston Summit report (Hansen and Eggers, 2010).

At the Charleston Summit, Hansen and Eggers (2010) summarised the marketing/entrepreneurship interface from four perspectives: the interaction between marketing and entrepreneurship; adopting a marketing framework lens to explore entrepreneurial issues; investigating marketing issues with an entrepreneurship framework; and identifying unique aspects of the interface. This research adopts the fourth perspective by seeking to identify the role of TO in the digital era and how it contributes to EM activity and behaviour in small young firms.

2.2.2 EM Definitions

EM has been defined differently according to various perspectives during past thirty years because scholars have often emphasised the importance of EM theory differently in their research fields (Jones et al., 2009; O'Cass and Morrish, 2016). The initial definition of EM is developed from 'three-factor model of entrepreneurship' to emphasise entrepreneurial activity and opportunity seeking by Miller and Friesen (1982). One widely adopted definition of EM is developed based on Miller and Friesen's definition as follows:

“The proactive identification and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to risk management, resource leveraging and value creation.”

Morris et al. (2002 p.5)

This well cited definition describes several characteristics of EM and its purpose which is opportunity seeking and profit retention. In addition, this is the first definition that emphasises use of the innovative approaches. Hills et al. (2008) have updated the definition of EM as an orientation that identifies opportunities in markets and firms' growth, so creating perceived customer value from several perspectives, including product innovation, market segmentation, and collaboration and networks. Again, the definition is expanded by Hills and Hultman (2011a, pp.6) as:

“A spirit, an effective (marketing) action or orientation ... to describe the marketing process of firm pursuing opportunities in uncertain market circumstances.”

Hills and Hultman (2011a)'s inclusion of external environmental uncertainty in their EM definition demonstrates their further understanding of SME issues and opportunities. However, what they did not include in the definition is the relationship with traditional marketing. Hills and Hultman (2013) identify attempts to distinguish EM completely from the traditional marketing in the context of SMEs and new ventures as a critical issue in current EM research. Despite EM being a standalone innovative marketing domain, EM is still related to several traditional marketing areas, such as service marketing, relationship marketing and international marketing (Hills et al., 2008; Whalen et al., 2015). Therefore, it requires a comparison of EM and traditional marketing (Section 2.2.3) to understand how EM is beneficial to young firms.

2.2.3 Differences between Traditional Marketing and EM

Hills et al. (2008) note that SME marketing is considered part of EM theory and it reflects the importance of the role of firm growth in SMEs (Stokes, 2000; Bjerke and Hultman, 2004). Thus, the characteristics of the SME marketing discipline, such as marketing being less planned and involving more intuitive marketing behaviour, with the founder-owner involved in marketing decisions, and the flexibility of marketing

activity, makes it highly relevant to EM (Franco et al., 2014). Moreover, several distinctive characteristics of EM, including pro-activeness, optimism, innovativeness, informality and unpredictable but visionary marketing behaviour, have been identified in a growing number of academic studies (Carson, 1990; Stokes, 2000; Bjerke and Hultman, 2004; Rowley and Jones, 2011).

In contrast to traditional marketing, EM focuses on the entrepreneur and their entrepreneurial actions. EM considers entrepreneurs as transformative leaders who are driven by their former entrepreneurial experience to deliver their vision as leaders, controlling the behaviour of employees (Hill and Wright, 2000; Ucbasaran et al., 2010). Consequently, the achievement of successful marketing behaviour depends on many aspects including the insights and knowledge of entrepreneurs (Bjerke and Hultman, 2004).

Stokes (2000)'s empirical study compares traditional marketing and EM (Table 2.2). Traditional marketing centres on customers and their interaction with product development and market changes, whereas EM relies on innovation and the identification of market requirements. Adoption of EM in small businesses produces close, interactive relationships between partners, the SME and its customers. Furthermore, EM may support entrepreneurs to break boundaries such as insufficient resources, lack of marketing knowledge and financial investment (Morris et al., 2002).

Table 2.2 Difference between traditional marketing and EM

	Traditional marketing	Entrepreneurial marketing
Concept	Orientation towards the customer: orientation toward the market and subsequent product development	Orientation toward innovation: orientation toward the idea and intuitive assessment of market needs
Strategy	Descending segmentation, targeting and positioning	Ascending targeting of customers and other influential groups
Methods	Marketing mix	Interactive/word-of-mouth marketing methods
Market intelligence	Formalised systems of investigation and intelligence	Informal networks and gathering information

(Source: Stokes 2000)

In using traditional marketing activities, also described by scholars as “administrative marketing”, the firm needs to collect significant information about consumers and markets to understand customer demand, and also gathering information to support product and strategy development. The firm’s strategic behaviour is made in advance of its marketing trajectory. Moreover, traditional marketing uses multiple methods to understand what happens in the market. Opportunity is hence recognised through

regular marketing analysis and financial figures are indicators of performance measures (Darroch and Mazerolle, 2013).

Conversely, EM emphasises the importance of innovation, particularly in new product and service development. Entrepreneurs may identify a new opportunity in the market or attempt to create a new market in terms of their ideas or intentions. The characteristics and personality traits of the entrepreneurs influence the marketing actions, making the entrepreneur participants in the marketing process. Therefore, the EM marketing planning and strategy are dictated by the entrepreneur's business visions, customer feedback and other influential organisations and stakeholders, such as partners, commercial consultants or customers. Entrepreneurs use word-of-mouth to acquire market opportunities as well as to commence their marketing actions. Therefore, they may pay much attention to customer satisfaction. Furthermore, entrepreneurs often establish several informal networks to collect information and perceive changes in the market (Carson et al., 2004; Jones et al., 2013b; Eggers et al., 2014; Franco et al., 2014).

The nature of EM therefore distinguishes it from traditional marketing because it is based on concepts, strategies, and methods, such as uncertainty, market size and opportunity, risk and market intelligence. EM, is an emerging innovative marketing approach that aims to reduce ineffectiveness associated with traditional marketing and allow young ventures to develop more competitive advantages (O'Cass and Morrish,

2016). Notwithstanding, EM is not completely distinct from traditional marketing. It has aspects of relationship marketing, SME marketing and B2B marketing (Whalen et al., 2015). Therefore, to understand EM and identify research gaps, the researcher has reviewed further literature on EM foundational theories that include entrepreneurship and SME marketing.

2.3 Theoretical Foundations of EM

2.3.1 Entrepreneurship

Research on classical entrepreneurship began with two famous economists, Schumpeter and Keynes and many subsequent studies about entrepreneurship acknowledge that they follow the principles of these two schools of thought (Carter and Jones-Evans, 2006). Compared to the Keynesian viewpoint, Schumpeterian entrepreneurs show optimism and fearlessness when firms are in difficulties (Estrin et al., 2006).

The Schumpeterian entrepreneurship literature suggests that the enterprise is the outcome of the creative destruction of the market and that the relationship between the government, entrepreneurs and markets give rise to entrepreneurship. The term ‘firm’, also known as ‘venture’ in this research, means a commercial organisation or platform, which both perceives the danger of the demand-and-supply imbalance on the market and creates the best opportunity for entrepreneurs (Drucker, 1993; Reisman, 2004).

The notion of creative destruction raised by Schumpeter is one that correlates to the process of innovation that demonstrates that the constraints of the free market have a negative impact, resulting decreasing mobility of surplus materials and capital (Reisman, 2004). Therefore, the ultimate mission of innovation is a reconstruction of the existing resources in the marketplace (Reisman, 2004).

With the changing needs of customer and market, modern entrepreneurship has turned its focus to the study of entrepreneurship and entrepreneurs. Consequently, there is an increase in research which contributes to the study of the behaviour and motivations of entrepreneurs, entrepreneurial processes in firms, marketing opportunities and effectuation (Shane and Venkataraman, 2000; Covin and Miles, 2007; Sarasvathy and Venkataraman, 2011; Kuratko, 2016). Kuratko (2016) suggests that it is always a great starting point to question ‘What is entrepreneurship?’ because there is not a universally accepted definition for the concept. Shane and Venkataraman (2000) describe the study of entrepreneurship as a ‘scholarly’ investigation that assists to create new products and services and, opportunities through asking questions of ‘how?’, ‘by whom?’ and ‘what determines opportunities?’ to a firm owner.

Moreover, the meaning of entrepreneurship is intertwined with the term ‘entrepreneur’ (Shane and Venkataraman, 2000; Covin and Miles, 2007). Therefore, studies about entrepreneurship mainly investigate the impact of entrepreneurs, their personal

characteristics and entrepreneurial behaviour. Therefore, there should be a discussion about who entrepreneurs are and how they act differently from other owner-managers to help understand the concept of entrepreneurship.

2.3.1.1 Entrepreneurs and SME Owner-Managers

Shane and Venkataraman (2000, pp.218) define an entrepreneur as “*a person who establishes a new organisation*”. This definition emphasises the purpose of an individual’s entrepreneurial action and, it highlights that entrepreneurs can be observed and studied by analysing the differences of their actions (Kraus et al., 2009). Additionally, Kraus et al. (2009) asserts that entrepreneurs may have different responsibilities from the founder/manager who own an organisation personally. Therefore, an owner-manager may not be as same as an entrepreneur may. It is therefore necessary to question that why some start-ups are run by entrepreneurs, instead of normal owner-managers.

Marvel and Lumpkin (2007) found that entrepreneurs adopt innovation as a powerful tool to seek and create more new opportunities to facilitate their firms’ marketing performance, whilst owner-managers spent more time and investment on productive technology and daily operational events to support a NPD process.

There is an interesting debate about how to define the identities of founders/owner-managers. Some researchers consider founders/owner-managers of SMEs to be the same as entrepreneurs because both entrepreneurs and founders/owner-managers take similar marketing actions and set up similar growth goals in marketing. However, there is a growing number of researchers in the entrepreneurial and SME marketing domains arguing that although SMEs founders/owner-managers exhibit several entrepreneurial traits and have the same decision-making role as entrepreneurs, they may and may not be entrepreneurs (O'Dwyer et al., 2009; Gilmore, 2011; Franco et al., 2014). Gilmore et al. (2006) point out that entrepreneurs, in the early stage of establishing start-ups, should be involved in several operational activities. In some extreme cases, entrepreneurs have to work alone to seek resources and funding for transferring their business plans into marketing activities (Gilmore 2011). This is often a high-risk process.

Kraus et al. (2009) lists the characteristics of owner-managers and entrepreneurs to identify the issues that link entrepreneurship to the success of their businesses (see Table 2.3). Table 2.3 shows that being an owner-manager requires a person to “be your own boss” and have a high need for achievement. Owner-managers should also be comfortable in reacting to changes and uncertainty in the marketplace. Consequently, it puts owner-managers in an uncertain environment and they need to measure the frequency of risks to support decision-making both in the short-term and incrementally

(Gill and Biger, 2012). Entrepreneurs share similar characteristics with owner-managers, such as the need for independence and internal control ability. However, entrepreneurs have several additional characteristics, which helps the growth of an organisation and the success of the business (Jin et al., 2017).

Table 2.3 Characteristics of Owner-managers and Entrepreneurs

Owner-managers' characteristics	Entrepreneurs' characteristics
Needs for independence	Opportunistic
Needs for achievement	Innovative
Internal locus of control	Self-confident
Ability to live with uncertainty	Proactive and self-motivated
Take measured risks	Visionary with fairness
	Willing to take greater risks and live with even greater uncertainty

(Sources from: Burns 2011, pp.36)

Entrepreneurs are opportunistic because they recognise as new opportunities what others view as problems. Entrepreneurs are innovators since they have abilities that transform opportunities into the innovative process (Tajeddini, 2010). Alternatively,

innovation is adopted as a robust tool to create opportunity or market (Tajeddini, 2010). Therefore, Burns (2010) believes that being innovative is the most significant distinguishing characteristic of entrepreneurs. Another entrepreneurial characteristic is pro-activeness, which encourages the entrepreneur to seek opportunity rather than to react to change. It assists entrepreneurs in learning about implementation of untraditional marketing methods (Hills and Hultman, 2011b). In addition, entrepreneurs may be willing to take greater risks in a more uncertain environment. Driven by a thirst for success and business idea achievement, the entrepreneurs are more willing to put themselves in an uncertain environment.

By underpinning the influence of entrepreneurship in firms and markets, entrepreneurs are leading actors who are under the spotlight. Scholars also define different types of entrepreneurs using a variety of terms (Jack et al., 2010; Gill and Biger, 2012). Multiple entrepreneurs (ME), for example, have the ability to manage a few new ventures (Pasanen, 2003) while a serial entrepreneur prefers applying and updating the entrepreneurial experience and knowledge in different industries (Westerlund and Svahn, 2008). Intra-preneurial involves the use of either comprehensive competition or collaboration among the subsidiaries of a large corporation (Sharma and Chrisman, 2007). Characteristics such as the goal-oriented, enthusiasm and non-linear perception of control highlight the differences between entrepreneurial behaviour and performance from managerial behaviour and performance (Shook, 2003). They also require the

involvement of the entrepreneur to deliver multiple tasks in a firm regarding budget control and a lack of employees (Stokes, 2000). Although entrepreneurs always start their businesses with clear original ambitions and motivations, as time passes, some owner-managers will change their activities in organisations for unidentified reasons (Hashi and Krasniqi, 2011). When addressing further development concerns, entrepreneurs prefer creating a new market opportunity to satisfying the demands of the existing customers (Sarasvathy, 2001).

2.3.1.2 An overview of entrepreneurship studies

Entrepreneurship scholars are often interested in either the entrepreneurial behaviour or the impact of entrepreneurship on the operations and management processes of firms. The impact always begins with an innovation process of new product development and service (Deakins and Freel, 1998). This innovativeness and opportunity-orientation results in increased job creation and also, new types of businesses taking opportunities in niches markets or new markets (Audretsch and Fritsch, 2002; Hashi and Krasniqi, 2011). Brown et al. (2007) notes that establishing a partnership or personal contact network (PCN) with other companies is a great strategy to acquire more competitiveness. Thus, the nature of these networking collaborations requires cross-organisational learning which provides advantages for entrepreneurs. It also allows for shared core competitiveness against threats from another large-scale firm (Estrin et al., 2006; Hashi and Krasniqi, 2011).

Sarasvathy (2009), alternatively, alerts us to a possible obstacle of current entrepreneurship research. She is concerned that too many researchers focus on entrepreneurs' personality traits and entrepreneurial characteristics, while there are few studies documenting the entrepreneurial process or recorded experience and reflection of the entrepreneurs in practice. Therefore, it may be a more effective approach to inform entrepreneurial studies by applying effectuation perspective (Perry et al., 2012). Sarasvathy (2009) argues that not all entrepreneurs are born but some are made. As non-entrepreneurial owner-founders they are thus offered a chance to become an entrepreneur through entrepreneurship education (Sarasvathy and Venkataraman, 2011). The author uses the metaphor of the 'lemonade principle' to illustrate that for the entrepreneur the business goal to make enough profits from a large market enough, and not aim to take the entire market (Sarasvathy, 2009; Sarasvathy et al., 2014; Melinda et al., 2015). Therefore, Sarasvathy (2009) suggests the five principles of effectuation that includes the bird-in-the-hand, affordable loss, setting up crazy quilt, lemonade and pilot-in-the plane to educate entrepreneurs on new ventures or start-ups.

Moreover, the theory of entrepreneurship effectuation also encourages owner-managers of any business to self-reflect by answering a series of questions, for example, who I am, whom I know, and what can I do (better). The fruitful outcomes of the implication of effectuation entrepreneurship are not only that innovation is highlighted in the

effectual process but also that effectuation facilitates the co-creation of value and performance in the firm.

2.3.2 SME Marketing

2.3.2.1 SME Marketing: Characteristics and Limitations

Understanding entrepreneurs and SME founders/owner-managers is the first step to exploring SME marketing. SME founders/owner-managers, specifically those who are entrepreneurial, tend to seek opportunity and collect information in the forefront of the market and transform customer needs and expectations in their production. Previous studies have acknowledged that a large number of new ventures and SMEs have failed because risks are beyond the entrepreneurs' control, but entrepreneurs are still willing to take growth opportunity with risk (Hills et al., 2010).

Entrepreneurs choose different marketing approaches in relation to which stage of the life cycle the SMEs remains (Carson et al., 2001). Entrepreneurs in start-ups emphasise the importance of product and customer engagement. Since entrepreneurs are always involved in their marketing activities, entrepreneurs gather information about the customer, evaluate whether marketing works and decide what marketing behaviour to involve (Gilmore et al., 2007; Gilmore, 2011). Moreover, Carson et al. (2001) believe

that entrepreneurs and SME owner-managers prefer adopting marketing approaches that they trust and do not switch to new approaches so often.

The characteristics of SME marketing include flexibility, rapid response to changes in market and external environment and, products and services innovation that make SMEs and micro-firms behave differently to large conventional companies (Gilmore et al., 2001; Parry et al., 2012). These characteristics also facilitate the performance of SMEs and provide multiple approaches to acquire greater profits and satisfy more customers' requirements (Westhead and Storey, 1997; Simpson et al., 2006; Parry et al., 2012).

Although the characteristics of SMEs presents advantages which strengthen the SMEs' marketing abilities to secure survival, inherent SME characteristics also create several marketing problems and issues; these include resource constraints, challenges with customer relationships, uncertainty in growth or innovation (Stokes, 2000; Quayle, 2002; MacGregor, 2004). Resource constraint refers to the limited resources available to the SME for growth, such as technology, experienced workers and capital investment (Shaw, 2004). SME research indicates that small firm have fewer resources and finance budgets than large companies had, which restricts the firm in terms of recruiting experienced employees. Finally, resource constraints lead to low competence and sometimes weaker performance in marketing (Carson, 1990).

Customer relationship issues indicate that the SMEs often have contact with a limited number of customers in a given industry or market niche, in terms of geographical location and the number of customers (O'Dwyer et al., 2009). SMEs have continually to try diverse methods to increase customers and previous research has confirmed that the smaller a firm, the less customers the firm has (Stokes, 2000). Uncertainty in firm growth mainly refers to the uncertain environment in which small firms seek to survive. SME owner-managers/entrepreneurs have to be aware of any information about changes in the market and adjust their marketing activities to react to the changes (Fillis et al., 2003).

Furthermore, uncertainty may also exist in the process of innovation. Although entrepreneurs in start-ups are willing to take more risks and invest more time and money in the innovation of new products, there is no guarantee the product innovation will meet the requirement of the customer because customer requirements are always changing (Appiah - Adu and Singh, 1998). SME owner-managers/entrepreneurs may also realise that marketing issues are barriers to growth and the promotion or selling innovative new products. Therefore, they will attempt to find appropriate marketing methods to facilitate business and marketing performance.

IT has been widely adopted as a vital marketing approach for SMEs to enhance their marketing activities. IT, such as e-marketing, helps entrepreneurs to access targeted

markets, introduce products and services, and communicate with customers (Nguyen et al., 2015). It also is applied as a cost effective method to increase sales volume and awareness of products (Carson and Gilmore 2000). Moreover, entrepreneurs can also use IT to develop credibility through the development of a professional commercial website.

However, past research show that entrepreneurs have to face lots of challenges when they are using IT application and software as the business solution (Gilmore et al., 2001; O'Dwyer et al., 2009). For new ventures and SMEs, entrepreneurs acknowledge that it is difficult to maintain or update their e-marketing methods because they do not have technical specialists (Gilmore, 2011). Gilmore et al. (2007) also pointed to customer relationship management (CRM) with low-efficient online communication results raising associated costs and causing customers to be lost. Nguyen et al. (2015) propose that SME entrepreneurs should adopt integrated e-marketing to facilitate their marketing activities from different perspectives.

2.3.2.2 Marketing Method used in SMEs: Traditional and Innovative Marketing

Three major types of marketing are used by SMEs: traditional marketing, digital marketing and networking (Gilmore et al., 2001; O'Dwyer et al., 2009). Traditional marketing, such as conferences, outdoor campaigns and word-of-mouth (WoM), are

beneficial to SMEs as they offer SME owner-managers the same marketing powers in the competition with large companies (O'Dwyer et al., 2009). Stokes (2002) finds that traditional marketing requires SME owner-managers to have a deep understanding of customer needs which involves investing lots of money and energy on market research for appropriate product positioning, customer segmentation and marketing efforts. These methods reflect the way in which SMEs should combine marketing actions and technologies. Other frequently used marketing approaches include WoM marketing. Past SME marketing scholars assert that WoM communication is the most powerful and effective method to sell products to customers. WoM marketing has a high success rate as it increases confidence and loyalty with customers and spreads at a fast rate (Román and Riquelme, 2014).

The second category is e-marketing which includes Internet and electronic versions of traditional marketing. It has been adopted widely by SMEs to create opportunities in the early stages of business (Khare, 2014). E-marketing decreases customer identification time as well as the cost of marketing and advertisement (Taiminen and Karjaluoto, 2015). Websites and the Internet provide lots of information about firms and their products and services increase customer confidence (Taiminen and Karjaluoto, 2015).

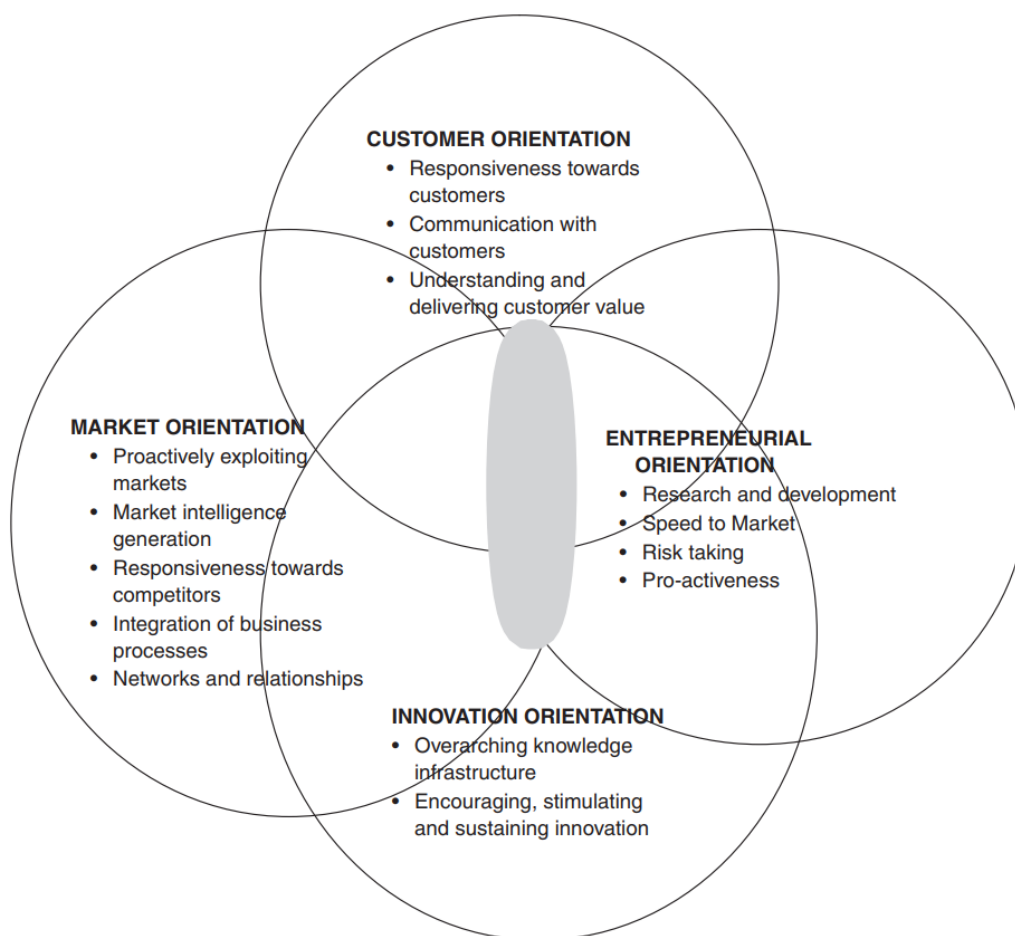
However, this marketing approach is constrained by location and number of customers. Networking is the third marketing method used by SME owner-managers to market their products and services (O'Donnell, 2004). A summary by O'Donnell (2004) shows that networking is mainly used for information collection by SME owner-managers. SMEs use both formal networks, such as networks with governments and large companies, and informal networks, including friends and employees to access market information. Additionally, Jones and Rowley (2011) develop the EMO model, which acknowledges networks for marketing actions through leveraging resource, creation of value together, and supporting making market decisions. Ionitã (2012) and Franco et al. (2014) found that networking is a fundamental concept of EM research to investigate the marketing activities and competitive capabilities of the small ventures. O'Donnell (2013) defines a network as a resource that provides extra resources, exchange information and offer financial support for NPD to the entrepreneur, while also defines networking is an interactive marketing approach to transform resource and learning the successful experience of another entrepreneur.

2.4 EM Orientation Research in the Context of SMEs

Entrepreneurial activity refers to 'orientation' as a set of entrepreneurial behaviours that involve business and marketing activities. Using this term helps researchers to develop new knowledge of the interface between entrepreneurship and marketing, from several

perspectives such as EO, MO and TO. A new venture may orientate itself as it develops and at different stages of development. By examining entrepreneurial activities, EM knowledge helps entrepreneurs facilitate firms' marketing performance effectively (Hakala and Kohtamäki, 2011). Previous studies have identified several EM orientations for instance SO, EO, MO, IO, CO, and the focus of this study TO (Lumpkin and Dess, 1996; Lumpkin and Dess, 2001; Rowley and Jones, 2011; Franco et al., 2014).

Figure 2.1 The SME Entrepreneurial Marketing Orientation (EMO) Conceptualised Model



(Source: Jones and Rowley 2011 pp.31)

In Figure 2.1, Jones and Rowley (2011)'s EMO conceptualised model emphasises that EM in SME context can be explained by examining the activities and behaviour of a firm; these being EO, MO, CO and IO. Additionally, the EMO model demonstrates that firm performance is improved by a combination of the four key orientations. Thus, EM researchers are encouraged to investigate relationships rather than differences between orientations within EM. Dimensions related to technology, such as 'sustaining innovation' under IO, 'understanding and delivering customer value' under CO and 'market intelligence' under MO, have been identified from previous TO research. This suggests the potential for an interface between EM and TO, being that EM has close relationships with the four key orientations. To investigate the relationship between EM and TO, the researcher has considered the literature on EO, MO, IO and CO.

2.4.1 Entrepreneurial Orientation (EO)

EO has been presented as a comprehensive concept and is intertwined with the process of marketing so that firms act entrepreneurially to improve the firms' operations, sales and other competencies (Morris et al., 2002). The distinction between EO and entrepreneurship is that EO discusses the major entrepreneurial processes of start-ups while entrepreneurship is a study of the content of a firm's decision (Lumpkin and Dess, 1996). This section discusses EO and its characteristics and, its technology related dimensions in sequence. It is comprised of several dimensions including autonomy, innovativeness, risk-taking, pro-activeness and competitive aggressiveness (Lumpkin and Dess, 1996).

2.4.1.1 EO and Entrepreneurial Characteristics

EO is a key component of EM and refers to the strategic process of an organisation's behaviour, structure and characteristics to increase competitive power and seek new opportunities (Lumpkin and Dess, 1996; Lechner and Gudmundsson, 2014). Zahra (2007) describe the study of entrepreneurial characteristics as being on two levels: firm-level and individual- (entrepreneur-) level. Thus, the entrepreneurship researcher can use EO theory to investigate the characteristics and behaviour that create or maintain firm competitiveness (Lumpkin and Dess 2009). Following this logic, recent EO researchers (Wales et al., 2013; Lechner and Gudmundsson, 2014) have centred on publications which describe the relationship between EO and firm performance through an understanding of various entrepreneurial characteristics. These major entrepreneurial characteristics relating to small business performance are pro-activeness, risk-taking and innovativeness (Lumpkin and Dess, 1996).

Firstly, pro-activeness refers to the firm's action and the entrepreneur's behaviour to take first-mover advantage and forecast future events (Lechner and Gudmundsson, 2014). Renko et al. (2009) identify an anticipating of the future which includes changes in market demands, opportunities and risks and uncertainties. Furthermore, the study of successful entrepreneurial firms suggests that pro-activeness is closely related to first-mover advantage (Hurley and Hult, 1998). Secondly, risk-taking is often apparent in uncertain markets and dynamic external environments (Morrish et al., 2010; Jones

et al., 2013a; Fillis and David Higgins, 2015; Miles et al., 2015). Thirdly, innovativeness refers to new products and ideas development, supporting entrepreneurs to have an insight into an organisation's creativity problems (Lechner and Gudmundsson, 2014).

Furthermore, there is a body of research which notes the positive relationship between entrepreneurial orientation (EO) and marketing orientation (MO). Various researchers highlight the fact that the owners of small firms, particularly market-sensitive firms, need to develop their entrepreneurial activity to find opportunities, understand customer demands and become more aware of the importance of innovation (Miles and Arnold, 1991; Knight and McCabe, 1997; Deacon et al., 2015). Kilenthong et al. (2016) also state that EO is a 'solid foundation' of entrepreneurship for the entrepreneurial behaviours of firms through examination of several identified characteristics of entrepreneurship such as innovativeness, pro-activeness and risk-taking. Innovativeness is described as a firm's tendency to recognise and adopt new ideas and introduce innovative processes and technology into its production (Renko et al., 2009). The finding may lead to a successful innovation emanating from a new product development process. It also helps an entrepreneurial firm to shift existing resources to new product development (Avlonitis and Salavou, 2007; Renko et al., 2009).

2.4.1.2 Technology involved dimensions in EO

Entrepreneurs use various IT tools to facilitate their network with business partners, governments and competitors. The theory of diffusion of innovation identifies Word-of-Mouth (WoM) as part of the process innovation diffusion (Godes and Mayzlin, 2004). The authors also maintain that the frequency of purchase and length of the customer lifetime value as well as the customer's influence on other consumers are three critical factors that determine the customer's value, but it should be considered both online and offline circumstances. Owner-managers have to seek another effective tool for business promotion at the SNS platform such as WOM (Zhang et al., 2012).

Conducting successful WOM-driven promotion depends upon how many people are in the 'social hub' and how many an individual is connected to. There can be a huge number of person-to-person contact networks in a particular area located in a firm's target marketplace (Kaplan and Haenlein, 2010). Goldenberg et al. (2009) likewise identify two classifications of the social hub these being the innovator (vendor or spokesperson) and the follower (customer) and the function of both sub-classifications is to accelerate the spread of messages.

Different views from earlier social media marketing studies have been examined in the literature. Both researchers and owner-managers agree that the WoM is an ideal

approach to segment and then engage more with potential customers (Austin et al., 2012; Hollenbeck and Kaikati, 2012; Haigh et al., 2013). Furthermore, WoM can be embedded inside other social media marketing activities. For example, Facebook elements such as wall posts, friend recommendations or public displays of satisfaction create a high degree of visibility between communicators and offers a 'playground' to understand and hook unknown potential customers by executing a WOM communication (Hollenbeck and Kaikati, 2012).

However, Goldenberg et al. (2009) voice concern about the unstable status existing within a social hub of a communicating network which can result in issues of trust and credit abuse. Using WoM on social media channels, such as Facebook, can strengthen the possibility of customer engagement geographically and numerically. There is increasing evidence that e-WoM approaches can assist growth or increase the financial profits of a start-up (Kraus et al., 2009; Harrigan et al., 2012b; Lang and Hyde, 2013). Moreover, previous SME marketing and EM studies acknowledged the limitations of investigations of the functionality and efficiency of e-WoM (Godes and Mayzlin, 2004). Similarly, future research also requires an understanding of a communication pattern of e-WOM via diverse social media platforms and the identification of the numerous elements involved and how extensively they are deployed (Chu and Kim, 2011; Silverman, 2011; Harrigan et al., 2012a).

Previous studies suggest that the study of EO in relation to other orientations helps makes it easier to understand other orientations such as TO and engage with alternative strategic orientations more readily (Lumpkin and Dess, 2001; Schindehutte et al., 2008; Rowley and Jones, 2011). The literature also acknowledges that EO is ‘... *akin to technological orientation*’ because EO guides an entrepreneurial firm to learn new technological knowledge and technical solutions regarding users’ latest demands (Atuahene-Gima and Ko, 2001, pp.56). Thus, EO plays a significant role that links entrepreneurs and entrepreneurial activity to the ‘innovativeness’ of product development and the technological orientation of the firm.

2.4.2 Market Orientation (MO)

Market orientation endorses a traditional marketing perspective that encourages firms either to satisfy customers' existing needs or to forecast the market's future move (Morris et al., 2005; Zhou et al., 2005). It creates an effective firm culture that stimulates the internal requirement for product innovation and even provides pivotal executive performance for the entrepreneurs (Schindehutte et al., 2008). Jaworski et al. (2000) describe market orientation as having two interpretations of the participants' behaviour: "market-driving" and "market-driven" behaviour.

The market-driving approach urges entrepreneurs to focus on radical innovation through the application of new product development, developing new channels and markets and even releasing new codes of the commercial transactions (Schindehutte et al., 2008). This approach strengthens the value of customers and their feedback (Carrillat et al., 2004). It requires firms to spend much time and energy to engage and identify the opinion leaders and then keep changing the firms' products according to customer preferences (Schindehutte et al., 2008).

In comparison, market-driven prefers the incremental or process innovation, which focuses on a proactive learning process and external competitor's movements (Schindehutte et al., 2008). It is also assumed that MO is a unique interface whereby entrepreneurial firms can identify market opportunities from the reaction of the market and their competitors, and not directly from customers (Webb et al., 2010). Rapid changes in the marketplace are not always accompanied with consumer's purchasing attitude and decision-making, while a firm's MO should stay close to the environmental changes around it (Webb et al., 2010).

In general, new ventures develop strategies or growth plans to match both market-driving and market-driven approaches simultaneously (Menguc, 2006; Schindehutte et al., 2008). Narver and Slater (1990) have developed a three-dimensional measurement to prioritise firm's performance by assessing customer orientation, competitor

orientation and inter-functional coordination. By using the three-dimensional measurement, market orientation manifests a strong connection with market performance (Voss and Voss, 2000).

Business relationships mean not only competition but also collaboration or partnership with firms, specifically in the small business sector. Collaboration with other small businesses in networks or built partnerships can then be conceptualised as an external supporting or strategic stress for firms (Mu and Di Benedetto, 2011). It is an appropriate method from a KBV to strengthen control of both tangible and intangible resources, reducing the entry barriers to industry and risks of customers' requirements (Mahadevan, 2000). Consequently, the firm can access external knowledge and resources that affect its market performance in an emerging economic climate within an alliance (Mu and Benedetto 2011; Gulati et al. 2006). The underlying concept of networking is that firms accessible to external resources or search channels are more capable of drawing new ideas from outsiders to expand the limit of marketing opportunities and the complementary network resources available to them (Mahadevan, 2000).

A firm applying networking strategy for new product development can receive sufficient resources from the other partners, which can subsequently enhance the value and probability of under-processing projects (Mu and Benedetto 2011). Network resource also means resources are embedded in a social network that can be accessed

and potentially deployed based on the location and rank of the firm in that network (Gulati et al., 2006). Network resources are only available to members of a particular network, while the quality and quantity of resources show a strong connection to the sale of new production (Mu and Benedetto 2011). Moreover, networking orientation has been manifested to have a positive impact on the new product innovation and its market performance (Mu and Benedetto 2011). Previous papers have confirmed that various networks, including personal contact networks, supply networks and social networks, helping entrepreneurs access opportunity as well as Word-of-Mouth (otherwise known as 'referral'). This approach is widely used to access the first business opportunity (Goldenberg et al., 2009; Mu and Di Benedetto, 2011; Stokes and Nelson, 2013; Franco et al., 2014).

External environmental uncertainty affects the performance of a firm's MO and marketing performance. Environmental uncertainty requires entrepreneurs to adjust to changes or make decisions with limited information about the environment and market. It is a comprehensive and multidimensional notion that interacts with the entrepreneurial firm and marketing action (Miles et al., 2015). Ashford and Hall (2011) list several external factors that may cause changes in a firm, such as policy, changes in market structure, technology updates and evolution and changes in customer needs. These changes may bring either issues or opportunities to a firm's growth (Ashford and Hall, 2011). For example, Jones and Parry (2011) found that effective government

policies and regional policies could accelerate the development of business incubators and new start-up firms.

In addition, environmental turbulence might disrupt an entrepreneurial firm's resource and capital advantages over to its competitors because they have to share the same fiscal investors and resource suppliers (Barringer and Bluedorn, 1999). The uncertainty of external environments can then be reduced or eliminated by applying continual organisational learning and structural entrepreneurial strategy (Davis et al., 1991).

However, seldom have market orientation studies tested their theories in a specific environment and, many of them require further research to explain the reason why firms' performance is different or why they vary among specific circumstances (Gao et al., 2007; Miles and Darroch, 2008; Mu and Di Benedetto, 2011). Market orientation has acknowledged a negative impact on product innovation; particularly market-led innovation (Zhou et al., 2005) and firm's performance tending to deteriorate after an economic recession (Grewal and Tansuhaj, 2001). To facilitate the MO and marketing performance of an entrepreneurial firm, Baker and Sinkula (2009) suggest an examination of both internal and external factors, including financial figures, quantities of sales, environmental uncertainty and technology.

2.4.3 Innovation Orientation (IO)

Entrepreneurs use innovation as a powerful tool to realise their entrepreneurial ideas as actions in start-ups and, in their given industry. Renko et al. (2009) present innovation as a process of new ideal implantation; thus, innovation is also considered as the outcome of a firm's knowledge, experience, skills and lessons because an entrepreneurial firm learns and grows in the process of implementation. Therefore, innovation helps entrepreneurs to develop ideas and perceive/understand customer needs intuitively (Stoke 2000).

Despite the previous innovation research highlighting advantages, including greater product development, increased strategy development and understanding of customer requirements, researchers have acknowledged that very few factors which impact the relationship between innovation and marketing performance have been discovered (Atuahene-Gima and Ko, 2001; O'Dwyer et al., 2009; Parry et al., 2012). One possible reason is that innovation can be categorised into different types.

Zhou et al. (2005) suggest that innovation has two types of studies, tech-based and market-based. Tech-based innovation emphasises the innovative technology in the product and service development which attempts to meet the needs of the existing customer, while market-based innovation focuses on creating markets or customers to generate new value for the potential customer in the future. These approaches indicate

that entrepreneur must have experience, ability and technological skill to apply the sophisticated use of innovation for business performance and for purposes of improving their business.

Rod and Paliwoda (2015) found that innovation has a close relationship with a firm's MO, decision-making, learning and firm's culture. These authors also found that innovation examines the ability of an entrepreneurial firm to implement a personal idea through entrepreneurial activity. The investigated abilities include time, resource, employee, organisational culture and (information) technology (Parry et al. 2012). SMEs' MO, for example, adopts new or emerging methods to collect information on customer's needs to reduce the tensions inherent to exploration and exploitation (Renko et al., 2009).

Furthermore, Brockman et al. (2010) highlight innovation as helping entrepreneurs to decide the types of technology to be deployed as well as the development of technological capability. Though the choice of technological capability and type are related to entrepreneurial characteristics and firm's capacity, it is mainly decided by the level of innovativeness, experience and skill in a technological oriented firm (Lewis et al. 2013). Therefore, innovation orientation indicates that the meaning of technology should be considered once again.

2.4.4 Customer Orientation (CO)

CO mainly discusses customers and competitors as well as their relationship to a firm's performance. With its foundations in SME marketing and service marketing, CO research centres on the impact of customer-centred marketing process design and value creation (Jones and Rowley 2011). Early SME marketing research shows CO to be a key component of MO (Carson et al., 2001; Orr, 2003) driving firm culture for employee learning and customer value creation in terms of firm's goal (Narver and Slater, 1990; Jones et al., 2003). It requires entrepreneurs to establish short-distance relationships with customers to seek and identify customer needs in day-to-day marketing activities (Tajeddini et al., 2013).

However, Jones et al. (2003) argue for a distinction between CO and MO and, investigate CO as the standalone concept for a greater understanding of how firms react to rapid changes in customer needs. Gil Saura et al. (2005) claim that the balance between CO and MO research highlights the importance of customer satisfaction (Tajeddini et al., 2013) and customer loyalty (Brady and Cronin Jr, 2001). Customer satisfaction allows a firm to continue to achieve organisational and commercial goals more effectively than its competitors (Yim et al., 2008). This has a positive effect on firms' performance (Tajeddini et al. 2013) because satisfied existing customers recruit potential customers, thereby increasing volume of products sold (Yim et al., 2008) and supporting firm innovativeness (Tajeddini et al. 2013).

Customer loyalty is defined as a customer's personal preference to decide and recommend to purchase products from the same firms (Homburg et al., 2012). Both the individual's decision and friend's recommendation require communication (Homburg et al., 2011). The level of customer loyalty is related to trust and the frequency of repeat purchase behaviour (Kim, 2011). Beyond these two factors, Kim (2011) emphasises that customer loyalty be directly related to customer satisfaction and, forecasting product/service quality is as important as the recommendation of others to help customers to make the purchase decision. It leads to an improvement in a firm's marketing performance.

CO also has several benefits associated with TO research. Ju Rebecca Yen and Gwinner (2003) note the benefits of online marketing/e-marketing as being confidence benefit, online communication benefit and particular treatment benefit, such as online transaction, payment and customer's purchasing intention prediction. Also, CO uses innovative technology, such as data mining (big data) to trace and understand changes in customer needs (Ju Rebecca Yen and Gwinner, 2003). In Gatignon and Xuereb (1997)'s TO research, 'customer needs' is considered as a dimension that draws links between a firm's business performance and TO adoption. Moreover, Hakala and Kohtamäki (2011) investigated the relationship between CO effects and TO performance in software firms based in Finland. The findings show that CO directly

influences firm behaviour to create technology, enhance firm culture and develop closer relationships with customers.

2.4.5 Strategic Orientation (SO)

Along with MO and EO, TO has been investigated as one of the key orientations referred to in the Strategic Orientation (SO) literature and in several EM studies (Miles and Darroch, 2008; Schindehutte et al., 2008; Baker and Sinkula, 2009). (Schindehutte et al., 2008; Lee et al., 2014b) describes strategic orientation (SO) theory as investigating the decision-making processes of entrepreneurs under irrational and uncertain environments. Supported by characteristics of technology, SO theory proposes synergies of multiple orientations that include MO, EO and CO and TO in supporting to decision-making, new product development or organisational learning (Zhou et al., 2005; Mu and Benedetto, 2011).

Firms are acknowledged to operate with several SO dimensions which create a positive synergic improvement in a firm's performance (Baker and Sinkula, 1999; Miles and Darroch, 2008). Jaworski and Kohli (1993) found that SO could guide production oriented firms to improve the quality and distribution of products and services and reduce costs to attract customers. Furthermore, Mu and Benedetto (2011) used a large-scale survey to find that SO emphasises the entrepreneurs' short-term decision-making abilities by exploring a new opportunity, increasing market knowledge and enhancing competencies.

Furthermore, TO highlights innovativeness and strategic decisions of production based on customer preferences (Zhou et al. 2005; Gatignon and Xuereb 1997). However, other researchers also argue that SO theory underestimates the role of entrepreneurs and their characteristics (Day, 1998; Miles and Darroch, 2008) and so hinders understanding of the prioritising of technologies, particularly in using electronic approaches. Thus, the researcher proposes that TO should not be subsumed under SO because TO is likely to involve key factors such as the entrepreneurial characteristics and marketing technology.

EM has close relationships with EO, MO, IO and CO in helping entrepreneurs to facilitate firm and marketing performance. It identifies how and why entrepreneurial characteristics impact on a firm's actions, seeking new markets and opportunities and enhancing understanding about customers, competitors and innovations. Furthermore, the researcher identifies TO as a distinct orientation which has been studied as an essential component of SO, emphasising the contribution of innovation and technological support involving decision-making (Hakala and Kohtamäki, 2011; Chahal et al., 2014). The topic of SO and its relationship with the various orientations, which include TO, serve as a starting point for discussing TO from various viewpoints in the next section (Section 2.5).

2.5 Technology Orientation

2.5.1 TO Definition

TO means the tendency of the firm to accept new ideas or use new technologies as technical solutions to meet consumers' new needs (Gatignon and Xuereb 1997). Salavou et al. (2004) found TO to be a key driver which encourages innovation of new ideas, new product and service development. As such, it is as important as entrepreneurship in facilitating a firm's performance (Srinivasan et al., 2002; Zhou et al., 2005; Hortinha et al., 2011). TO also leverages benefits in technological proficiency and flexibility to overcome a lack of resources and expertise in SMEs, specifically in start-ups (Hakala and Kohtamäki, 2011; Hortinha et al., 2011). An early, well-cited definition of TO is provided by Gatignon and Xuereb (1997, p. 78) and is as follows:

"... the use of sophisticated technologies in new product development, the rapidity of integration of new technologies, and proactively developing new technologies and creating new product ideas." ... "Technology orientation also means that the company can use its technical knowledge to build a new technical solution to answer and meet new needs of the users".

This definition emphasises the functionality of TO from both product innovation and marketing aspects. Product innovation emphasises the significant role of technology in information gathering and new product development. TO in sales refers to marketing tools monitoring changes in the market, identify and meet the demands of the market

(Atuahene-Gima and Ko, 2001; Hall and Rosson, 2006; Hortinha et al., 2011). Many researchers of technology have adopted or re-echoed this view. Herhausen (2016) notes that a firm needs to use TO and MO to build a solution to deal with the on-demand uncertainty of customers.

TO can also improve a start-up's capacity to seek marketing opportunities, build temporary sales tactics and provide various tools in communication and advertisements (Zhou et al. 2005; Gatignon and Xuereb 1997). Empirical evidence shows that TO within an entrepreneurial firm can deliver more benefits to existing customers and enhance the firm's capacity to respond to various market force issues. The issues for firms include demand uncertainty, competitive intensity, technology policies and identification of market opportunities (Salavou et al., 2004; Zhou et al., 2005; Hall and Rosson, 2006).

2.5.2 TO in New Product Development (NPD) and Innovation

TO has an effect on a technical firm's process of product innovation. Innovation is a much broader notion that accepts new knowledge, processes, ideas or design into new products and services (Carroll and Siguaw, 2006). It can be incremental, breakthrough or radical in terms of how fast the innovation happened and whether it is continuous (Zhou et al. 2005). Breakthrough innovation offers a tight connection with innovative commercial technology (Wind and Mahajan, 1997). Technology-led innovation

strengthens the requirements of existing markets and offers more customer value than marketing the product itself (Zhou et al. 2005). Additionally, a technology-led innovation indicates tremendous risk because developing and implementing innovative technology is expensive and requires specialists and extensive investment (Zhou et al. 2005). Subsequently, state-of-the-art technology such as e-WoM and social media shows a positive influence on breakthrough innovation during new product development (Zhou et al 2005). It also offers more advantages that enables the new venture to facilitate service or product development ahead of either competitor's capacity or customer's expectation (Slater and Narver, 1996).

Despite the increasing attention paid to technological research, researchers also acknowledge that they have very limited understanding of technologies and their adoption in a firm's marketing activities (Hunter and Perreault Jr, 2006). Lee and Grewal (2004) identify a set of digital marketing approaches, such as the Internet and websites, resource stack and instant communication software, which can build communication channels with customers and facilitate firm performance. However, they also admit that it is not clear how firms have collaborated via e-alliances (online networks).

2.5.3 Administrative Marketing in EM

Stevenson and Gumpert (1985) use the concept of administrative marketing, to distinguish the traditional marketing approaches used by entrepreneurs from others in SME marketing. Stevenson and Gumpert (1985) argue that employees and other founder-managers may evaluate the firm's marketing performance by using a traditional marketing figure, such as ROI, despite the entrepreneur acting as an opportunistic, innovator and risk-taker. Most business opportunities and consumers are identified from various administrative marketing channels related to the marketing actions of young ventures (Hills and Hultman, 2011b). Furthermore, some employees and some founder-owners may consider that cost of the entrepreneurial marketing activity is not an affordable cost (Sarasvathy et al., 2014). Therefore, entrepreneurs may use several administrative marketing approaches, such as outdoor advertising, exhibitions and meetings and conferences, to satisfy the expectations of their employees.

Additionally, administrative marketing means traditional marketing methods related to entrepreneurial marketing actions (Hills et al., 2008). Entrepreneurs are suggested not to take the existing marketing strategy, such as the marketing mix (4P's) and prints (on newspapers, magazines and leaflets) (Trusov et al., 2009) to sell products/services, but they still need to take several administrative marketing methods, such as WoM and telephone, to develop the relationship between business partners and local authorities (Collinson and Shaw, 2001; Trusov et al., 2009).

2.5.4 Digital Marketing in EM

TO can provide marketing technology, such as e-marketing and mobile application, to increase a firm's competitive advantages further (Hortinha et al., 2011; Chen et al., 2014). However, prior research investigating the impacts of technology on marketing performance, such as website, Facebook, e-CRM or Search Engine Optimisation (SEO), has shown negative effects on TO (Gilmore et al., 2006; Chaffey, 2009; O'Dwyer et al., 2009; Hortinha et al., 2011). As a further development of e-marketing, digital marketing explores all data-driven marketing technologies (Chaffey and Ellis-Chadwick, 2012). Therefore, this section will discuss three major digital marketing aspects: e-marketing, social media marketing and mobile marketing.

2.5.4.1 E-marketing

Electronic marketing (e-marketing) refers to the proactive marketing actions on Internet-based platforms (Chaffey, 2009). Gilmore and Morrish (2011) define e-marketing as a useful marketing activity involving technology that helps entrepreneurs to advertise widely, reduce marketing costs and increase awareness of products in specific markets. E-marketing methods include the Internet, website, emails and real-time communication (Gilmore et al., 2007). Website displays centring on information recommendation and introduction are the simplest but most efficient approach to online users.

Email, nowadays, still shows its unique advantage as a budget promotion channel (Bazeley and Jackson, 2013). Notwithstanding junk mail and hacking attacks, email continues to be the primary choice to segment or encourage the online merchant (Merisavo and Raulas, 2004). The establishment of a digital marketing channel for electronic commerce (E-commerce) offers a multi-dimensional platform to access global opportunities for small business sectors (Kian Chong et al., 2010). Digital marketing reduces financial cost and accumulates business partners and customers in a short period (Franco et al., 2014; Holliman and Rowley, 2014). Moreover, convenient online payment and financial transaction systems support the development of e-marketing approaches in SMEs (Kolesar and Wayne Galbraith, 2000).

Chaffey (2009) broadly defined e-marketing as “the use of digital interactive technologies” to complete commercial actions. Breaking through barriers of commercial hours and geographic limitations (Gilmore, 2011; Collinson and Shaw, 2001), e-marketing allows entrepreneurs to develop websites with professional business descriptions and attractive images to give customers more confidence and credibility (Gilmore 2011). For increased SME performance, e-marketing can improve efficiency in product and firm information provision and new opportunities (Nguyen and Barrett, 2006). Use of e-marketing is beneficial to SMEs by adding online advertisement and real-time communication with consumers (Taylor and Strutton, 2010). Indeed, Tiago and Veríssimo (2014) point out that e-marketing is an effective

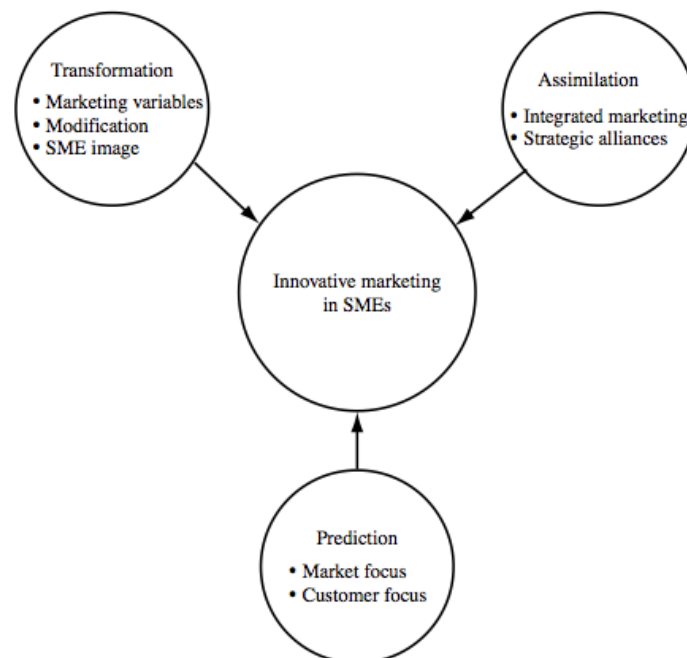
way into the product/service marketing mix and to extend into global marketing. Development of a seamless communication channel between the customer and service provider reduces the cost and energy of information exchange and also enhancing the frequency of user participation (Matook and Vessey, 2008; Barnes et al., 2012).

Electronic Customer Relationship Management (e-CRM) is customer management focused method of e-marketing (Li and Calantone, 1998). Joshi and Sharma (2004) find that CRM is frequently used as the most valuable communication method to interact and engage with customers. In turn, Harrigan and Hulbert (2011) identify that SMEs use e-CRM for several purposes: to decrease the risk of competitors, seek new opportunities and markets and for networking. E-CRM ensures entrepreneurs focus on marketing performance and develop a long-term relationship with potential customers (Zineldin, 2000). Moreover, this method has begun to replace advertisements to deliver information about products immediately (Zineldin, 2000). However, Harrigan et al. (2012b) have acknowledged that use of e-CRM requires entrepreneurs to master knowledge and skill of the Internet-Based technologies (IBTs). Day and Hubbard (2003) have found that most owner-managers were concerned about how to use e-CRM as a complete system.

The adoption of e-marketing by SMEs is initially driven by market competition and technology evolution (McCole and Ramsey, 2005). O'Dwyer et al. (2009) have verified

a series of hypothesis through the Transformation, Assimilation, Prediction and Exceptionally (TAPE) framework (**Figure 2.2**) into the innovative marketing study. The model highlights the marketing behaviour that closely links with the firm's characteristics, including transformation, assimilation and prediction.

Figure 2.2 TAPE Framework



(Source: O'Dwyer et al., 2009; pp.512)

2.5.4.2 Social media marketing

Several social media approaches are noted for offering interactive information-exchanging functions such as tagging, web forum and customer ratings and evaluation

systems (Xiang and Gretzel, 2010). The concept of social media refers to all online communication-based information systems that apply web 2.0 technologies and allow customers to create and share their knowledge and experience (Kaplan and Haenlein, 2010). The purpose of social media is to achieve diverse commercial aspects, such as information exchange, and relationship engagement, and to invite users to get involved in the role of value co-creators and collaborators (Harrigan et al., 2012a).

Two categories of social media marketing are noted: customer engagement and digital information processes (Holm, 2006). Customer engagement means that an interactive result-oriented representation of interest towards a firm or its brand (van Doorn et al., 2010). The value of customer engagement from the management perspective is to develop permanent and stable credit and retention with loyal customers (Nguyen and Mutum, 2012). Information processes can be broken down into several steps that include information reciprocity, information capture, information integration, information access and information use (Kumar et al., 2010). Moreover, Wong et al. (2005) have suggested an effective information diffusion model with six 'R' perspectives: readiness, recklessness, reliance, reciprocity and response.

Zheng et al. (2013) have tested the five top-ranking social media (LinkedIn, Facebook, YouTube, Twitter and Blog) for commercial efficiencies. Outcomes from the research suggest that social functions, 'likes' and comments visualising the information and

logic in inclusive dialogue (Chan and Guillet, 2011), while most users are price-sensitive customers preferring micropayment as the significant transaction approach (Ahmed et al., 2001). Moreover, a suitable strategy can target communication objectives for successful marketing implementation (Haigh et al., 2013).

Conversely, researchers have suggested disadvantages and so offered guidance. The huge pressure on firms to use technology-driven marketing and significant financial expense are considered unnecessary for firms, specifically SMEs (Debatin et al., 2009). The privacy of personal conversations is also at risks, and receiving and handling negative comments on a process of the service review, such as sharing photos or friends' video on public (Houghton et al., 2013). Ultimately, both managers and customers complain how much time is dedicated to handling irrelevant information or messages on a regular basis.

2.5.4.3 Mobile Marketing

Almost half of UK residents own at least one smart mobile device (Ofcom, 2012) and the trend looks to continue to increase. More than 50 percent of interviewees admitted that they prefer viewing, ordering and making a payment on their mobile screens (Ofcom, 2012). Varshney and Vetter (2002) defined M-marketing in general as all the commercial electronic behaviour happening on wireless devices. (Daniel and Wilson,

2002) also, portray it as a new e-business purchasing platform that allows customers to order and undertake bank transfers anytime anywhere via a wireless device.

Relying on the development of mobile transportation technology, M-marketing introduces a fruitful marketing philosophy to owner-managers (Aksoy et al., 2013). It realises the two-way or even multiple communication that strengthens the implementation of marketing, particularly in international business by offering a solution to restrictions time and location (Shankar and Balasubramanian, 2009). Subsequently, advertising on mobile telecommunication allows firms to provide custom contents to a specific consumer cluster, or encourage sharing and transmitting between customers and their friends (Scharl et al., 2005). Moreover, M-marketing offers plenty of payment options to customers through credit cards, text messages or even prepay telephone credits, which raises the success rate of the impulsive expenditure and customer behaviour control (Scharl et al., 2005).

The existing M-marketing literature proposed considering M-marketing as a perception approach to trace changes in customer purchasing and decision-making behaviour while exploring social networking opportunities in real-life (Shankar and Balasubramanian, 2009). Additionally, the advantage of telecommunication technology helps owner-managers to overcome the limits of entry to a specific market (Bauer et al., 2005). Furthermore, San Martín et al. (2012) supplement this argument

by stating that the success of M-marketing requires both innovative technology adoption, organisational and environmental factors control. San Martín et al. (2012) also suggest that the owner-manager should focus on the degree of customer value earned in communication instead of how frequently the product information is delivered to the customer.

The issue of most concern to researchers so far is the protection of private data and information sharing policy. Here, Unni and Harmon (2007) found that three-quarters of UK citizens expressed concerns about the location of data stored in the commercial companies. Interestingly, the customer who has shared his location data and other personal information on any social media platform, has a more open attitude and is less concerned about how his data is used for business promotion activities (Dennis et al., 2009).

2.5.5 Rationale of TO in EM

Gatignon and Xuereb (1997) warn that TO should not be considered as a concept in traditional marketing because it also leads to many advantages in the management perspective. However, EM is a relevant new cross-disciplinary knowledge domain that provides advantages of either a management or marketing firm. Moreover, it is an area of growing interest to SO and TO studies and there are calls to explore the factors, relationships and constraints between the technological capacity and firm performance

(Zhou et al., 2005; Kim et al., 2013; Brouters et al., 2015; Ozkaya et al., 2015). The relationship between marketing activities and IT and its importance to SME firm performance should also be investigated. Therefore, it is important and necessary to discuss the function of TO in EM theory.

According to the Knowledge-Based View (KBV), IT is about the process or processing of meaningful information. Therefore it is a kind of knowledge and an ‘intangible’ resource (Bollinger and Smith 2001). Previous scholars have proven that the adoption of TO in SMEs increase their capacity in production and new product innovation while decreases operational and administrative costs to acquire more renewable competences (Salavou et al., 2004; Alpkan et al., 2007).

Furthermore, the boundaries between technologies are blurring because information communication technologies are adopted in the process of product development, operations and administration. Simultaneously, a growing number of productive technologies are transformed and applied to a firm’s marketing activities (Chaffey and Ellis-Chadwick, 2012). Therefore, this PhD researcher argues that the TO concept currently espoused should be extended to include a broader vision of TO which will encapsulate e-marketing, E-CRM, digital marketing and social media. The need is also recognised to examine the interface between TO and EM, for example how

entrepreneurial firms seeking new opportunity or access to consumer's demands use technology.

One challenge is to understand TO as be a term derived from industry. Srinivasan et al. (2002) explain that technology-oriented firms own at least one mature and unique technology in products and service and viewing other firms to have the same or similar technology as their rivals (Neumann and Von Hirschhausen, 2015). Most of these technology-oriented firms have a clear vision in production, whereas they may not be aware of the demands of their customers and opportunities in the market. Trainor et al. (2011) explain that the firms' IT capability is a critical factor to success, and their case studies suggest that firms may acquire superior expertise and customer understanding by adopting appropriate e-marketing methods.

However, some scholars find that standalone marketing technology, such as e-marketing and social media, shows negative efficiency about young ventures' marketing performance. Alternatively, an approach including several information technologies is advised (Glazer, 1991; Atuahene-Gima and Ko, 2001; Harrigan and Hulbert, 2011). Srinivasan et al. (2002) found that there are always some businesses which fail because they either fail to adopt radical technologies or use inappropriate ones. However, it is not clear which information technologies should be included.

This PhD research thus proposes that technology-related marketing in TO should appear as a continuum, from productive technology to communication technology, thereby offering greater flexibility and more superior technological competence. This researcher therefore argues that the concept of TO incorporating marketing communication technology may facilitate further understanding of customer's demands and co-creation potential, so capturing further technology-driven opportunities in the market.

2.6 Proposed Conceptual Framework

2.6.1 Research Question and aims

This research develops research question is to investigate the interface between TO and EM orientations in the context of new ventures in the energy service industry. The research question is:

What is the role of TO and EM in new ventures within the energy service industry?

The rationale is that new ventures face many barriers to success because the characteristics of SMEs. Furthermore, new ventures addressed in the energy service industry have extra challenges to overcome because they run businesses in an uncertain environment. This research therefore investigates a sample of the firm within this industry.

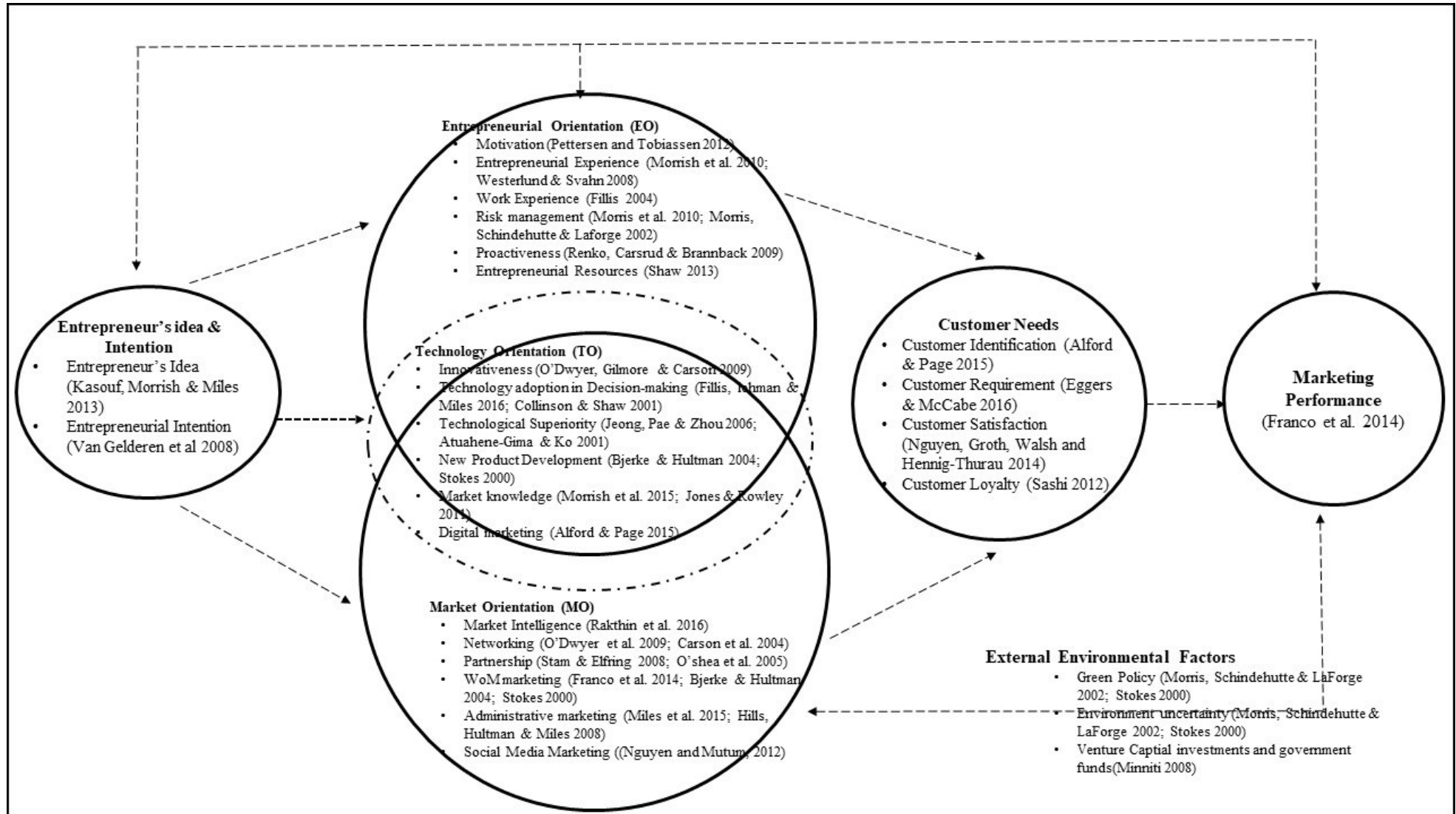
The literature review has identified numerous aspects to support the investigation of TO and relevant aspects of EMO. Hence, this research presents a conceptual model based on the existing literature, the Technological Entrepreneurial Marketing Performance (TEMP) model. Applications of the model are intended to address the overarching research aim: to examine how Entrepreneurial Orientation (EO), Market Orientation (MO) and TO (inclusive of digitally enhanced marketing activities) may contribute towards firm's EM performance.

2.6.2 Conceptual Framework Development: Technological Entrepreneurial Marketing Performance (TEMP) model

Inspired by the Jones and Rowley's (2011) EMO conceptual model and Whalen et al. (2015)'s entrepreneurial marketing contingency framework, a conceptual model TEMP (Figure 2.3) has been developed to structure the research aims mentioned above and to identify the several research propositions to be investigated. Jones and Rowley's EMO framework has been broadly accepted within EM research, while Whalen et al. (2015) also proposed a contingency framework which describes the value co-creating process of marketing processes in entrepreneurial firms which can facilitate further competitive advantages.

This framework acknowledges the role of market opportunity and reflects on the opportunities and the operating decisions of an entrepreneurial firm. The capacity of operant resources, production knowledge and environmental turbulence are identified. Here, the authors suggest that if the firm has the capability to use EM behaviour then they will be able to acquire further temporary competitive advantages. The framework outlines the process of how an entrepreneurial firm conducts its marketing by using both traditional marketing approaches and EM. Taking this further, the researcher considers that using a study of EM and relevant SOs in a technology industry context will allow for further study of how EM related orientations can facilitate competitive advantages and produce increased sales performance in entrepreneurial firms. A new conceptual model TEMP is thus proposed.

Figure 2.3 The Technological Entrepreneurial Marketing Performance (TEMP) model



The TEMP model (Figure 2.3) represents a summary of dimensions related to new venture marketing performance improvement from past literature of EM, TO and SME marketing. The dimensions refer to literature evidence that is identified from prior literature about entrepreneurship, TO and EM. Entrepreneur's idea (and intention) has been identified in prior research as the source of a firm's entrepreneurial activity in the small business sector (Kasouf et al., 2015). Most entrepreneurial ideas and intentions are about specific products or services that entrepreneurs have already familiar with in their previous working or life experience, while few entrepreneurs claim that their entrepreneurial ideas and intentions are enlightened by new knowledge and understanding about the potential business opportunities (Van Gelderen et al., 2008; Kasouf et al., 2015).

Kasouf et al. (2015) point out that, though most entrepreneurial ideas and intentions may be changed by entrepreneurs to in line with the firm's growth during the development of SMEs, entrepreneurial ideas (and intentions) help entrepreneurs to demonstrate their entrepreneurial characteristics in firm operations, NPD and proactive in marketing activity (Van Gelderen et al., 2008). These evidence help to draw lines from 'entrepreneur's idea and intention' to 'EO', from 'entrepreneur's idea and intention' to 'MO'. Furthermore, Garud and Giuliani (2013) discover that existing '(entrepreneurial) ideas' leads entrepreneurs to develop new product and innovation and identifies marketing opportunities. Van Gelderen et al. (2008) also found dimension 'entrepreneur's intention' is the other start point of an entrepreneurial process by transforming innovative ideas into innovation and NPD, setting up a new business and identifying business opportunities for the entrepreneurs. Therefore, this

research uses the dimensions ‘entrepreneurial ideas’ and ‘entrepreneur’s intentions’ as the start point of the TEMP development.

The initial relationship between ‘entrepreneur’s idea and intention’ to ‘EO’ is that most entrepreneurial ideas and intentions formed in past ‘work experience’ and few are generated in ‘entrepreneurial experience’. In EO, Fillis et al. (2003) found that work experience hold by a person who became entrepreneur later might differ from other worker and, the work experience is in relation to several entrepreneurial characteristics, such as proactiveness and innovativeness. Dimension ‘entrepreneurial experience’ is a different way that allows entrepreneurs to transform their ideas into entrepreneurial activities by implementing new knowledge in firm running and NPD (Morrish et al., 2010). Several previous researchers use the dimensions ‘work experience’ (Clausen and Korneliussen, 2012; Fatoki, 2014) and ‘entrepreneurial experience’ (Morrish et al., 2010) to develop an understanding of the entrepreneurial characteristics that are associated with market opportunity identification. Therefore, ‘work experience’ and ‘entrepreneurial experience’ are two underpinning dimensions of EO.

Additionally, previous literature (Morrish and Deacon, 2009; Renko et al., 2009; Pettersen and Tobiassen, 2012) discussed the impacts of entrepreneurial characteristics, such as risk-taking, proactiveness and innovativeness, on MO and the understanding of customer needs. Morrish et al. (2010) identified a small-sized firm’s marketing activities and its attitudes towards customer needs, on the most level, are decided by the entrepreneur’s personal motivation (Pettersen and Tobiassen, 2012) and how many activated entrepreneurial characteristics they owned (Morris et al. 2002). Followed

Jones and Rowley (2011)'s research logics of the development of the EMO framework, the dimensions about entrepreneurial characteristics 'risk-taking', 'proactiveness' and 'innovativeness' address under EO. Also, Shaw (2013) represents that various marketing activities, such as attending an entrepreneurship competition, development of networks and collaboration with potential business partners, create or accumulate 'entrepreneurial resources'. Shaw (2013) believes 'entrepreneurial resources' is a dimension under EO since it has close relationships with risk-taking, past work experience and proactiveness.

In previous MO literature (Matsuno et al., 2002; O'Dwyer et al., 2009; Franco et al., 2014; Miles et al., 2015), the evidence centre at market information and various marketing activities and the impacts of these activities on firms' marketing performance. Kumar et al. (2011) and Rakthin et al. (2016) highlight the importance of 'market intelligence/knowledge' that helps the entrepreneur to create or identify new opportunities and changes in customer needs. Insights into the market intelligence and understanding market knowledge are foundational marketing activities that assist entrepreneurs to use different marketing approaches (Rakthin et al. 2016). With the help of market intelligence/knowledge, entrepreneurs are confidence to develop 'networking' (O'Dwyer et al. 2009) and 'partnership' (Stam and Elfring, 2008) with other entrepreneurs or business owner-managers. Additionally, previous MO literature also discusses various marketing activities (approaches) including, WoM marketing (Franco et al. 2014), social media marketing (Nguyen and Mutum, 2012), digital marketing (Alford and Page 2015) and administrative marketing (Miles et al., 2015). Suggested by the EMO framework (Jones and Rowley 2011) these dimensions mentioned above are addressed under MO.

In the Venn diagram, TO and its dimensions are drawn in a dotted line circle and are seating on the interface between EO and MO since some dimensions of TO are sharing with EO and MO. Previous literature (Hakala and Kohtamäki, 2011; Malhotra et al., 2012) suggest that TO plays a mediating role in their marketing performance research with several software-development young ventures. Zhang et al. (2015) claim that TO, as the mediator between EO and MO, helps SMEs to absorb changes in customer needs and market into NPD and innovative activities. Therefore, TO should address on the interface between EO and MO.

TO has sharing dimension 'innovativeness' with EO and several dimensions with MO, such as 'market knowledge', 'digital marketing' regarding the TO definition given by Gatignon and Xuereb (1997). Gatignon and Xuereb's empirical study (1997) highlights that TO strongly impacts on radical product innovation in an entrepreneurial start-up. While technological superiority (Mu and Di Benedetto, 2011) can offer a unique competitive advantage that is difficult to be imitated by a firm's early competitors and, technology also offers long-term effects on marketing decision-making and firm performance (Schindehutte et al., 2008). Meanwhile, previous literature demonstrate evidence that TO has its unique dimension, such as 'Technology adoption in Decision-making' (Fillis et al., 2014), 'Technology Superiority' (Jeong et al., 2006) and 'NPD' (Stoke 2000), enhance the performance of entrepreneurial actions from the marketing perspective.

Next, previous literature (Alford and Page 2015; Morgan 2015) also evidence that isolated NPD and innovation and ignoring of changes of customer needs are two of

major reasons lead to the failure of young ventures in several industries. Nguyen et al. (2014) suggest 'customer needs' should include four dimensions that are 'customer identification', 'customer requirement', 'customer satisfaction' and 'customer loyalty' to improve a young venture's competition power from the psychological perspective. Hakala and Kohtamaki (2011) emphasizes that a combination of EO, TO and MO has a positive relationship with a firm's marketing performance.

Previous literature (Kilenthong et al. 2015; Franco et al. 2014) also discuss the important relationship between EM activity and marketing performance. There is not clear how to measure marketing performance for a young entrepreneurial venture, though many previous researchers have proposed marketing performance measurements. Carson's (1990) six exploratory models for SMEs' performance measure and Jones and Rowley's (2011) EMO framework have been adopted by a growing number of qualitative researchers in entrepreneurship and EM studies. Therefore, this research will employ several pilot case study to collaborative with some senior entrepreneurs to identify how they measure the firms' marketing performance in reality.

Finally, Morris et al. (2013) and Morrish and Deacon (2009) listed several external factors that may affect the performance of an entrepreneurial firm, that includes environmental uncertainty and competition. Environmental uncertainty, which includes market turbulence, competition, and external environments, and information, have frequently been discussed in marketing performance studies (Gatignon and Xuereb, 1997; Hill and Wright, 2000). Matsuno et al. (2002)'s research also evidenced that EO

strengthens innovation in new-to-the-market product development process; with market mistakes often being caused by either the entrepreneurs' inappropriate perceptions of the market or, rapid changes of external environments and consumers' demands in terms of insufficient support in technology (Atuahene-Gima and Ko, 2001; Sultan and Wong, 2011). Julian and Ahmed (2005) found that government policy has a significant positive impact on a firm's performance.

2.7 Chapter Summary

To summarise, there is a strongly held agreement that EM is an emergent theory different from traditional marketing theories and strategies. EM theory centres on studies of informal, unpredictable but visionary marketing activities often in high-risk and high-uncertain circumstances. Furthermore, entrepreneurship, SME and EM scholars are beginning to acknowledge that technology plays an important role in market-driving practices and innovative marketing techniques. Currently, research of TO and innovative marketing technology, such as digital marketing, social media marketing and mobile marketing, is being researched in small firms and requires further investigation. Thus, this research project attempts to investigate the relationship between EO and TO from an EM perspective in relation to marketing performance.

This chapter highlights the inter-relationships between existing theories, which includes strategic orientation, the role of the entrepreneur, and the meaning of technology orientation in start-up SMEs. More specifically, this PhD researcher proposes a conceptual model, TEMP, which argues for all marketing approaches, such as network,

e-marketing, WoM and mobile applications, to be investigated together in terms of all other key aspects of the business and marketing of the firm. The TEMP model also highlights the potential significance of the additional profits that a small business can acquire, through an understanding of how an entrepreneur can interact effectively with the technological marketing approaches it has selected.

Chapter Three: Methodology

3.1 Introduction

This chapter discusses the research methodology and different research methods used for addressing the research question. Bryman and Bell (2009) suggest that research design and development of methodology for business research have four fundamental steps. These steps include: (1) a research philosophy that demonstrates the philosophical stance and theory of knowledge; (2) a research strategy that provides research logic and criteria to select methods for data collection; (3) a data collection method that refers to the approach or tool used to collect data related to a particular research question; and (4) a data analysis method simplifying the technique and tool used to analyse data, such as triangulation (Bryman and Bell 2009).

This chapter is organised into four parts. The first part aims to demonstrate an understanding of both an ontological research stance and the epistemological approach deployed. In the second part, the researcher explains the adoption of a qualitative research approach using a mixed methodology. The third part describes a suitable research strategy, a single case study involving multiple participant firms in one industry. Finally, the different research methods adopted within the case study are outlined and discussed. These include online non-participant observation and semi-structured interviews, for data collection and triangulation for data analysis.

This research determines a qualitative research approach with the single case study to interpret the research process based on the proposed research question. A single case

study is a flexible phenomenon targeted research strategy that has been widely used for marketing and entrepreneurship studies (Yin 2009). Furthermore, development of the data collection methods within case study depends on the chosen philosophical stance to collaborate and populate the proposed conceptual framework, TEMP model, to identify the relationship between entrepreneurial orientation, technology orientation and market orientation in conjunction to improving the marketing performance of young ventures. The researcher also uses a triangulation method to analyse all the empirical data collected from various approaches to enhance the validation of the proposed conceptual framework.

This chapter is organised as follows:

- Section 3.2 introduces the nature of philosophical foundations: Interpretivism is the epistemological stance deployed in this research while constructivism is elected as the ontological stance, both help to identify case study as the research strategy for this PhD project.
- Section 3.3 presents the two dominant research approaches: qualitative and quantitative and the reason why the researcher has chosen a qualitative research approach for this research.
- Section 3.4 describes the research context which includes details on the development of the UK energy service industry related to ESCOs since 1972. Moreover, this section also develops a review of the UK sustainable and green energy policies to demonstrate the comprehensive structure of the UK energy service industry. By understanding the fostering of relationships between UK government green energy policies and young ventures in UK ESCOs, this

chapter sets out the case study as an appropriate research strategy for the research.

- Section 3.5 introduces the case study research design. This research uses the energy service industry as a single case in relation to Yin's single case study development. It explains the nature and characteristics of the case studies used in the study. The researcher then describes the case design and criteria for selection before a description of the participating young ventures. Additionally, the research ethics involved in the case study are discussed.
- Section 3.6 describes two major approaches for data collection that are the Internet-based online observation and card-based semi-structured interviews. The Internet-based online observation assists the researcher to collect secondary data from the 34 selected ESCOs, while the researcher uses the card-based semi-structured interviews to collect primary data with the founder-owners of the energy service young ventures.
- Section 3.7 discusses the data analysis methods that enable verification of multiple resources of evidence in the construction of the entrepreneur's technology knowledge. The data is analysed independently from each source and will then be analysed cross-sectionally from multiple sources.
- Section 3.8 discusses all possible research issues and ethics concerns in the beginning. It also offers a set of solutions to prevent or protect all the participants involved in this research.

3.2 Research Philosophy

Philosophy is a logical concept that deals with concerns about human understanding or a fruitful outcome of thinking in reality (Crossan, 2003). Regarding the research philosophy, it is understood as the foundation of both scientific and social research domains that justifies the developments of research proposition and methodology (Saunders et al., 2009; Babbie, 2015). Hales (2016) and Saunders et al. (2009) point out that any contemporary research, particularly in the social science field, demands an involvement of research philosophy to understand the structure of knowledge and justification of knowledge.

A research philosophy hence provides answers for two major questions that are which methodology should be adopted and why the selected methodology is rational and valid (Bryman, 2012). The research question explains what methodological method ought to be adopted straightforwardly, while the second aspect requires a sophisticated understanding of multiple philosophical natures that includes ontology, epistemology and research ethics and the methodology selected (Crossan, 2003; Saunders, 2011).

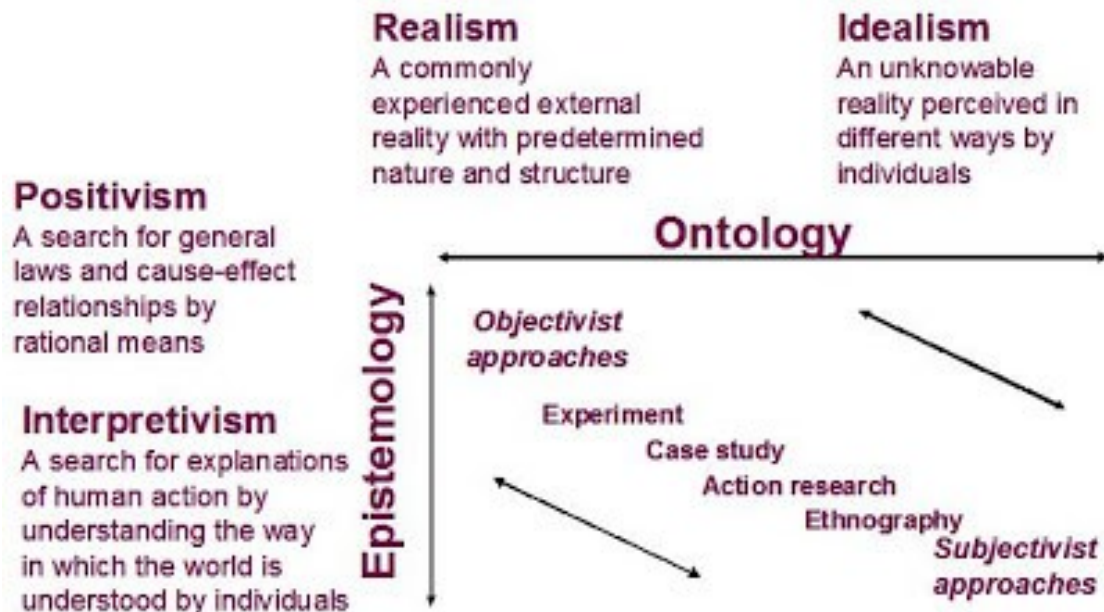
3.2.1 Epistemological Stance

Epistemology is defined as the study of knowledge, belief and justification (Creswell, 2013). The nature of epistemology is to identify and access the value of knowledge and validation (Hales, 2016). Carter and Little (2007) believe that knowledge means a form of justified true belief (JTB) where a traditional tripartite schema ‘*S* knows that *p*’ has been used to make a judgement of whether the knowledge obtained is truth or not by

philosophers over two thousand years. The tripartite scheme is seen as a perfect approach until it comes across the Gettier case (Williamson, 2013). The Gettier cases have successfully proven that the reliability ought to be added as the fourth condition into the scheme and, it is critical to have a process of knowledge justification (Carter and Little, 2007; Williamson, 2013). Furthermore, the knowledge justification process emphasises an understanding of the structures and sources of knowledge, which alerts researchers to choose differently to conduct studies on various subjects (Carter and Little, 2007). Bryman (2012) lists the set of major classifications of the epistemology such as interpretivism, positivism and critical realism.

Interpretivism is described as a robust and effective epistemology adopted that adopted in a wide range of management and marketing fields. Its characteristics include content discourse, logic and situation analysis and its capacity to address complexity (Carson et al., 2001; Black, 2006) have been benefited to this research. As one fruitful outcome of the development of German Hermeneutics and Phenomenology in the social science, interpretivism highlights a range of sources of knowledge that include subjective and relevant events, participative relationships and observations and interpretations (Seymour, 2006; Bryman and Bell, 2011). Many qualitative studies adopt interpretivism, positivism or critical realism as their epistemological philosophical foundations (Figure 3.1) (Bryman and Bell, 2011; Bryman, 2012). Therefore, this research has decided to use interpretivism as its research methodology.

Figure 3.1 Research Epistemology influences on Qualitative Research



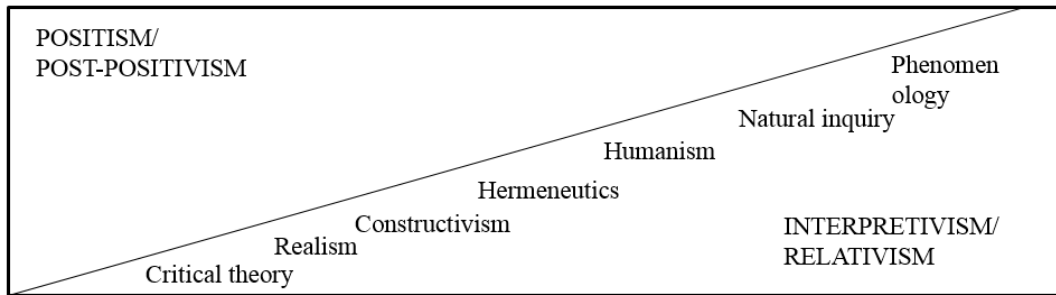
(Source: Sexton 2002)

Positivism offers a powerful philosophical position that encourages adoption of scientific and other well-structured research approaches to improve the accuracy and rationality of research (Carson et al., 2001; Hanson and Grimmer, 2007; Saunders et al., 2009). Therefore, it has been widely adopted in quantitative studies to justify the knowledge such as neutral observation and universal laws of science (Keat, 1971; Johnson et al., 2006; Saunders et al., 2009). Alternatively, a British philosopher, Bhaskar et al. (2002) proposed critical realism to justify the outcomes of positivism in the early 1970s. Other scholars have suggested using critical realism that means a movement in philosophy by introducing scientific research methods, such as experiment, into social science subject areas (Collier, 1994).

Bhaskar et al. (2002) believe that the essence of philosophy is critique and justification. Thus, truth cannot, in reality, be accessible until a researcher has completed a process of recognition and justification (Collier, 1994). One reason why critical realism is unsuitable for this research is because it is an 'in-depth' justification of knowledge construction and, it has been used in several mixed methodological or quantitative research in business areas, such as Mole and Mole (2010), Gruber and Henkel (2006) and Hunt and Morgan (1996).

With interpretivism, the nature of research requires an understanding of various relationships among human, knowledge and social phenomenon. It thus justifies knowledge through the way that the subject represents, interprets and presents attitudes towards the selected research object (Hudson and Ozanne, 1988; Ochieng et al., 2016). Interpretivists consider that selected research constitutes comprehensive unjustified knowledge, while the ontology of interpretivism thinks that it is not possible to access knowledge directly; consequently, it may rephrase the structure of knowledge only to identify the justified knowledge (Hume, 1793; Saunders et al., 2009; Luan, 2010). Furthermore, regarding the different research interests and propositions, prior researchers that with the epistemology suggest a further classification which includes objectivism, social constructivism and subjectivism (Nicholls, 2009; Saunders et al., 2009; Leitch et al., 2010).

Figure 3.2 Continuum of Research Philosophy



Source: Carson et al. (2001) *Qualitative Marketing Research*, Pg.8.

Additionally, Carson et al. (2001) suggest an understanding of the research philosophical position within a continuum (Figure 3.2). The continuum displays several epistemological positions that are on a continuum towards either positivism or interpretivism, so researchers can decide the most appropriate position to seat and start research (Carson et al., 2001). The continuum suggests the pure objectivism and subjectivism can be understood by scientific approaches such as critical theory and realism and, by thoroughly interpreting approach such as phenomenology. Therefore, an interpretivist, on the ontological level, can implement an observation from both inside and outside of the reality while positivism centres on the principles internally. Otherwise, positivism prefers to collecting, and then analysing data through more logically, and scientifically oriented methods, while the interpretivist prefers to use a natural approach.

Regarding other more comprehensive research approaches, the continuum proposes the adoption of post-positivism based mixed philosophies, such as Hermeneutics and

Natural. Inquiry, because these philosophies bring advantages from both discursive communication and scientific investigation (Carson et al., 2001; Johnson et al., 2007; Bryman, 2012).

3.2.2 Ontological Stance

Ontology is believed to be one essential dimension of the nature of research philosophical and it is the study of being or to be (Welty, 2003). Ontology deals with reality as actual existence (Welty, 2003) or “*claims and assumptions that are made about the nature of social reality*” (Carter and Little, 2007; Mack 2010, pp.5). Furthermore, adopting ontology in social science research means that the research reality selected can be understood from the perspective, at a particular given point, of a set of relevant sociological factors, such as those taken from society, the political environment, culture and economy (Hudson and Ozanne, 1988; Saunders, 2011). Therefore, the ontology of interpretivism prefers to studying both the processes and outcome of a social phenomenon based study rather than focusing only its result (Holden and Lynch, 2004).

Saunders et al. (2009) describe ontology as a specific philosophical consideration of a conception that discusses the essence of the thing and its relationships to the account of existence. Thus, in the study of EM, the researcher can describe the ontology of research by understanding a set of dimensions, such as entrepreneurial characteristics, partnership and marketing technology. Furthermore, several research methodological researchers discuss ontology from the viewpoints of objectivism and subjectivism,

however, other method authors argue it is incorrect to distinguish objectivism from subjectivism (Carson et al., 2001; Bryman, 2012).

Furthermore, discussions of social ontology also refer to two research positions objectivism and constructionism (Bryman and Bell, 2015). Objectivism implies that research objects and phenomena, as well as their meanings are existences. It allows the social researcher to develop a standardised process to research because objectivism has rules and regulations (Bryman and Bell, 2015). Constructionism, also known as constructivism, considers social phenomena as associated with social actors' actions and, the interaction of social actors gives the social phenomena and their meanings. Palia and Mak (2014), for example, suggest that (moderate) constructionism would be a better ontological stance to guide social phenomenon involving research. Therefore, this PhD research has decided to use constructivism as its ontological stance.

This PhD project aims to understand multiple relationships among the demands of entrepreneurial energy young venture, market opportunities and the functions of Technology Orientation (TO) in a dynamic governing policy that cover all circumstances. Gronroos (2006) has defined the term 'relationship' as a long-term and interactive engagement between humans. In other words, a relationship is a type of knowledge that based on the interpretation of human subjects.

Therefore, social research that focuses on relationships should use the objectivism as their ontological foundations. Moreover, this research also investigates how young

entrepreneurial ventures, ESCos, construct their understandings on the adopting technologies in their daily marketing and entrepreneurial activities. Therefore, the research logic of this PhD research is mainly subjective because it requires a good-understanding of the characteristics, motivations and behaviour of entrepreneurs.

3.2.3 Constructivism in Technology Research

3.2.3.1 Constructivism

Constructivism theory is a relevant new cross-disciplinary theory developed based on initiation of Piaget's construction theory (Wadsworth, 1996). Constructivists believe that the 'justified knowledge' about reality and society exists differently in people's minds. Hence, it is not necessary to identify knowledge by using the power of particular scientific tools and methods (Stayer, 1998). Therefore, the constructivist user replaces the term 'truth' with 'knowledge' and identifies reality existing independently. Hence, it can only be discovered rather than created by using the set of research and educating approaches together (Wadsworth, 1996; Stayer, 1998). Different from objectivism, constructivist researchers believe that knowledge learning is a discovery process of transforming to exchange, replicate and regurgitate but always acquire information and experience from external environments (Wood, 1995; Nosaka, 2011).

Previous researchers have suggested that constructivist perspectives involve three categories: early constructivism (also known as trivial constructivism), personal constructivism and social constructivism regarding influencing and applying knowledge transformation (Ernest, 1994; Cunningham and Duffy, 1996; Duffy and

Jonassen, 2013). Like Von Glasersfeld (1991), constructivists claim that knowledge is a reflection or subjective perception of the external environment. The emergence of personal constructivism highlights the impact and experience of individual participants in a learning process; it thus encourages educators to extend constructivism theory according to other aspects (Carter and Little, 2007; Duffy and Jonassen, 2013).

To highlight the influence of individual experience in knowledge, constructivists use approaches such as in-depth interviews and focus groups on studies and teaching (Doolittle and Camp, 1999). Therefore, knowledge also requires a construction of the subjective part through using previous social experience, communication or interaction with other individuals (Hacky 1998). Constructivism has been cognitively developed in the set of sub-types such as social constructivism, learning constructivism, and radical constructivism and psychological constructivism (Perkins, 1999; Boghossian, 2006).

3.2.3.2 Importance of Constructivism

The previous literature on entrepreneurship and EM shows that the growing numbers of the phenomenon-orientated research tend to use interpretivism to understand knowledge such as entrepreneurs' actions, identifications and classifications of entrepreneurial organisations, as well as innovations and technologies in the dynamic environment (Patel and Irani, 1999; Chell and Allman, 2003). However, interpretivism has been criticised for acquiring individual information and benefiting individual cases but failing to generalise those benefits on a social level (Chell and Allman, 2003).

Therefore, Chell and Allman (2003) have argued that the interpretivist can adopt constructivism as a special ontological stance to access dynamic knowledge from many perspectives. The reasons for adopting constructivism in this PhD research are multifaceted.

First, interpretivists can use constructivism to explore or verify EM knowledge by cooperating with entrepreneurs. Interpretivists have published a growing number of studies on entrepreneurship and EM to identify entrepreneurial demands and opportunities and explore the nature of entrepreneurial behaviour (Chell, 2007; Wood and McKinley, 2010), while they have acknowledged limitations to understanding entrepreneurial activity from the technological aspect. One possible reason is that past literature had not discovered the functions of technology by considering entrepreneurs' opinions and their experience of technology in the EM and energy service domains.

Other qualitative researchers have also attempted to access more information about technology from the young venture owner-managers. However, most research has narrowly defined technology as productive technology and few of them have attempted to extend the meaning of technology. Using constructivism, interpretivists have designed the interactive process with owner-managers and entrepreneurs naturally to explore the full meaning of technology in the UK ESCos by 'discussing' and 'exchanging' information on technology.

Secondly, constructivism helps both researchers and entrepreneurs to address problems inside organisations to construct a better understanding of the entrepreneurial actions by exchanging knowledge between academic researchers, entrepreneurs and employees. The entrepreneurs and other owner-managers may use the research process to build systemic stories of their companies or reflect unnoticed problems (Barge, 2004). Bouchikhi (1993) argues that an entrepreneurial process means a triadic model of the entrepreneur, environment and opportunity via constructing six independent case studies. The participants have also acknowledged several existing problems except having a better understanding of entrepreneurship (Bouchikhi, 1993).

Finally, there is a growing interest in adopting constructivism to build or verify the theoretical frameworks in studies of both technology and entrepreneurship. Duffy and Jonassen et al. (1995) have discussed a technology-oriented theory that proved entrepreneurs can achieve their original business goals by understanding the in-depth meaning of user data properly. Furthermore, Aalto et al. (2014) have proposed a new framework that combines existing energy security frames and environmental frames to guide the growth and sales of Russian energy companies. Constructivists have developed and evaluated a triadic analytical framework constructing Russian's energy policy development, the behaviour of entrepreneurs and the external environment by using multiple cases of the Russian's energy companies (Aalto et al., 2014). This research project aims to develop a theoretical framework of technology in the EM and so uses the UK energy industry and energy firms as research contents to seek a pattern. Therefore, constructivism is the best research approach for this research.

3.2.3.3 Constructivism Adoption in Technology Research

As mentioned earlier in the previous literature review chapter, studies of technology have three major classifications: the realm of technology, historian and sociology. A positive and synthetic relationship of technology and sociology studies have been described in several prior studies (Schot, 1992; Bijker et al., 2012; Hutchby, 2013). Bijker et al. (2012) have noted that studies of either sociology or technology and other science have been started receiving significant benefits from working together and “a new wave of social constructivist case studies” has been applied encouragingly in technological research.

Despite several technology studies using social constructivism in technology studies, many scholars have argued that using social constructivism may ignore the voices of founder-owners of micro businesses that only have one person (Lindgren and Packendorff, 2009). Since social constructivism needs different evidence resources for verification (Lindgren and Packendorff, 2009), while its impacts on society and culture are overemphasised (Doolittle and Camp, 1999) and ignore the values of the participant’s emotions (Ross, 2006). Therefore, the research uses constructivism as its ontological stance to understand EM knowledge from a TO aspect.

This PhD research project uses constructivism as its philosophical stance because constructivism allows the researcher to construct (demonstrate) the understanding of young venture’s EM activity and performance with both literature evidence and entrepreneur’s interpretation (research findings). Instead of theory development independent, constructivism assists the researcher to share knowledge and experience

with entrepreneur by identifying what marketing activity and technology are compulsory and how.

Furthermore, using constructivism helps this research project to verify the proposed theoretical TEMP framework. Both knowledge of EM and TO are mainly resourced from the interpretations of subjective judgement. Therefore, one goal of this research is to develop a good-understanding of TO content by discussing the meaning, function and impact of TO with entrepreneurs. EM, demands not a simply subjective interpretation of the relationship between the Technological Orientation (TO) and young ESCos, but a comprehensive explanation about the interactive behaviour among the entrepreneurs, technological products and the marketing and marketing performance of the young firms. Moreover, EM studies need an understanding of the entrepreneurs and their firms with social environments in several aspects, such as entrepreneurial experience, the business networks of firms, product innovation, and adopted technologies. Therefore, this research uses constructivism to guide the research process and theory building.

3.3 Research Approach: Qualitative or Quantitative

As one of the emerging notion of the research methodology field, the term ‘approach’ is used as an integrated cluster to enhance the inner connections of Kuhn's scientific research design (Bryman and Bell, 2011). Bryman (1985) defined a research approach as:

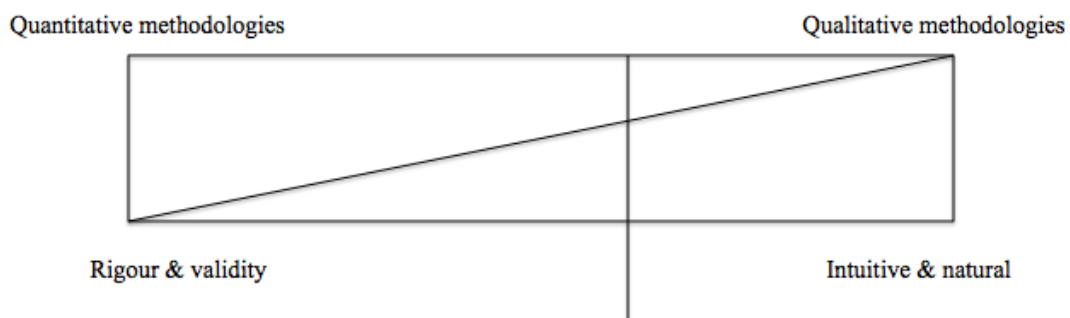
"a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, ... , how results should be interpreted ..."

Research approach sets up some real assumptions that describe the underlying functions and usages of descriptive or scientific research in the business and management area (Bryman and Bell, 2011). Several social science methodological studies divide research approach as two types: the qualitative and quantitative approach (Saunders et al., 2009; Bryman, 2012; Bernard, 2017). Business and marketing researcher tends to adopt a qualitative approach with the relationships or phenomena based research in the social science domains, while the quantitative approach is seen to excel in the numerical involved studies and it has a broad adoption in scientific domains (Saunders et al., 2009). Furthermore, methodologists propose a range of solutions to use the mixed research approach to receive more benefits from both qualitative and quantitative research (Bryman, 2012; Creswell, 2013; Babbie, 2015).

A continuum between qualitative and quantitative approaches are proposed to satisfy the fundamental requirements of the research methodology and design process (Carson et al., 2001). It includes what the underlying criteria are to develop, how to distinguish the compelling evidence to collect from all "useful information" (Polkinghorne, 2005), and likewise how a data analysis approach is decided. The continuum encourages placing a multifaceted design that leverages the advantages received on both aspects, while the advantages allow implementing the "in-depth" investigation continually to research object (Carson et al., 2001; Bryman, 2012).

To improve reliability and validity in business research, scholars also suggest that the qualitative oriented research can employ statistical approaches such as meta-analysis or comparative group experiment (Figure 3.3) (Bryman and Bell, 2011; Carson et al. 2001). Moreover, the previous entrepreneurial marketing and entrepreneurship literature indicate that the contributions of qualitative methods highlighted in their phenomenon-oriented researches are made by applying continuum or mixed research designs (Bjerke and Hultman, 2004; Sullivan Mort et al., 2006; Jones et al., 2011). Therefore, considering the research approach as an integrated continuum helps to understand its essence and enhances understanding of research design.

Figure 3.3 Qualitative and Quantitative Continuum



Source: Carson et al. (2001) *Qualitative Marketing Research*. SAGE Publications Ltd., P.53.

With a focus on the scope of marketing study, EM researchers endorse a qualitative approach to have more general use than the quantitative approach, since it provides more precise discursive details on entrepreneurial behaviour, a decision-making model

and consumer behaviour (Romer, 1994; O'Regan and Ghobadian, 2004). Nonetheless, the quantitative approach also contributes to eliminating the measurable error of research design, verify the reliability of qualitative evidence and build up a mixed data analysis system (Hodgkinson et al., 1991; Amaratunga et al., 2002; Will M. Bertrand and Fransoo, 2002; Song et al., 2009). Therefore, this research adopted the qualitative approach has benefited from not only qualitative research methods, such as interview and observation but also quantitative methods, such as survey (Amaratunga et al., 2002; Hanson and Grimmer, 2007).

As discussed in the previous literature review, the research question of this PhD research centres on that how the entrepreneurs (mainly owner-managers) with the Energy Service Companies (ESCOs) can understand the demands of the market and capture the opportunities by highlighting the relevant technologies and their functionalities from multiple aspects. The researcher decided to use the qualitative approach because nature is a phenomenon based research in the social science domain. Collaborating with the UK primary energy efficiency policy, Green Deal, the growths and performance of ESCOs as social phenomena have raised several research interests in the management and marketing domains (Hannon et al., 2013).

The researcher developed philosophical stances (Table 3.1) that adopts interpretivism as the epistemological stance and, constructivism which relies on interpretivism as an ontological stance. The research philosophy of this study is that of interpretivistic philosophy and inductive research enquiry as there is very little research on new technology-driven firms or entrepreneurial marketing and TO.

Table 3.1 Research Philosophical Stances

	Research Philosophical Stance
Epistemology	Interpretivism
Ontology	Constructivism

This PhD study is mainly subjective research because it requires a thorough understanding of an entrepreneur's traits, thoughts and behaviour. It is also an inductive study that was initially carried out by developing the research background context, the literature and with visits to exhibitions and exploratory interviews (phases 1 and 2). The researcher decided to adopt constructivism from an interpretivist's viewpoint because the critical research goal is to investigate the relationship between EM knowledge, TO and a firm's marketing performance.

The ontological view suggests that constructivism is the best view to access knowledge of what lies between EM and technology relationships (Carson et al., 2001; Crotty et al., 2010; Bryman and Bell, 2015). This approach requests a better understanding of the multiple relationships among the government policy, firms in the energy industry and their marketing in ahead. Therefore, this research decided to use the qualitative as the research approach.

3.4 UK Energy Service Industry and Green Energy Policy

This section aims to discuss the development of UK energy service industry and ESCOs and their links to UK green energy policy. The UK is considered the frontier of energy efficiency implementation. The UK government has accumulated substantial experience in environmental pollution control and has been skilled in developing Acts and policies to reduce CO₂ emissions. The Department of Energy and Climate Change (DECC) are responsible for the creation of green energy legislation and policies such as Green Deal. The UK energy service industry is acknowledged as a developing market because of the flexibility of ESCOs and uncertainty on the market (DECC 2010). Thus, key issues and the impacts of Green Deal on UK energy service industry will be discussed.

3.4.1 UK Green Energy Policy and Energy Efficiency Programmes

There have been several green energy efficiency programmes in the UK since the early 1970s (Boardman, 2004). Green energy policy in the UK refers to an energy efficiency programme that involves government funding or financial reimbursement of large utility companies (DECC 2010). Table 3.2 illustrates the expenditure of the UK government on energy efficiency programmes between 2003 and 2006. A significant increase of about £1 billion over a three-year period is observed (Mitchell and Connor, 2004).

Large utility companies include British Gas, E.On, EDF Energy, Npower, SSE and Scottish Power, all of which supply electricity and gas to British residents (HECA,

2013). It is a mandatory obligation for the large utility companies to fund small energy efficiency firms to provide energy efficiency services to British residents. Additionally, the UK government supports the creation of small energy service firms to provide more innovative products and services directly to residential customers.

Table 3.2 Expenditure of the UK Government on the Energy Efficiency Programs

DTI	Offshore wind capital grants	102
	Bio-energy (combustion) capital grants	33
	Bio-energy (pyrolysis) capital grants	5
	Bio-energy (heat) capital grants	27.7
	PV capital grants	20
	Clear skies (community and household) capital grants	10
	DTI New and Renewable Energy Programme R&D indirect spend	52
	DTI New and Renewable Energy Programme R&D direct spend	4.5
	Wave and tidal	5
	Embedded generation (metering, storage and control demos)	4
	Planning facilitation	2.5
	Unallocated SR2002	35
	Unallocated White Paper	32
Defra	Bioenergy Infrastructure Scheme	3.5
	Energy Crop Scheme	29
Research Councils	TSEC	28
	SuperGen	25
	Tyndall Centre	10
	Carbon Vision	14
Other	Carbon Trust	15
Devolved Admin	Scottish Community and Householder Initiative	4.7
	Scottish Intermediate Technology Institute	45
	Promotion of RE by Scottish Executive	3
	Raise awareness of renewable energy (NI Assembly)	4.5
TOTAL		514.4
ROC expenditure	Based on Hansard figures above	1200
EU Framework 6	Estimate	60
Overall total: 2002–2005		£1780 million

(Sources: Mitchell and Connor 2004 pp.1941)

These policies and programmes encourage UK residents to understand the significance of energy efficiency programs and then change their daily behaviour thereby improving energy efficiency proactively on the consumer side. The UK government has offered a direct but cheap long-term solution to reduce the overreliance on fossil energy including oil and coal (Ritchie and McDougall, 2008). Consequently, the UK government has

raised three major initiatives for deduction of carbon emission at the industry level and education for the consumer on the importance of energy efficiency.

Table 3.3 provides a chronological list of energy efficiency initiatives. McAlinden (2011) has claimed that the schemes and technology aimed at reducing consumption are still in its infancy. Although it was the beginning of the energy conservation programme, the three initiatives helped scholars to identify the postulated barriers and major reasons caused by climate change (McAlinden, 2011). Consequently, the central government that defined the responsibilities and rights of local governments to fight against climate change in 1995, subsequently published the 2013 Home Energy Conservation Act. Moreover, the Act claims that the reduction of the CO₂ and another greenhouse gas is the top priority goal to achieving this (“Home Energy Conservation Act 1995, further report March” 2013; (Butler and Neuhoff, 2008). A further stage commenced in 2005 with the launch of a certificated test which highlighted renewable energy technology as being part of the government’s energy efficiency improvement programme. These programme listed below are seen as the foundations of the Green Deal policy.

Table 3.3 UK Energy Efficiency Initiatives

Energy Efficiency Initiatives	Dates	Aims and Achievements

Community Energy Saving Programme (CESP)	2009 – 2012	A cooperative programme between the government, local authority and energy supplier; Aims to improve energy efficiency for low-income residents and properties.
The Home Energy Conservation Act	1995	Enhanced local authorities and the abilities of local governments and councils to use their identities to improve the energy efficiency of all residents in their locality.
Home Energy Assistance Target	1998 – 2011	The first environmental initiative; Efficient products ought to be frequently updated; Highlighted personal benefits of every participant; Successfully achieved as 87% of UK people realised the importance of environmental improvement; Operated in Scotland only.
Feed-in-Tariff (FIT)	2007 – 2013	To build 1 million new greenhouses to save 25% use of electricity and 10% CO2 emission; Known as clean energy cashback; To encourage British residents to create or customise their green electricity;

<p>Renewable Heat Premium Payment (RHPP)</p>	<p>2011 - 2013</p>	<p>A government-funded scheme provides money to purchase sustainable energy products, services and technology;</p> <p>Mainly focused on high technology products, such as solar panels, heat pumps, biomass and air source heat pumps;</p> <p>Offers an approach to reduce residents' utility bill by changing their purchasing habits and lifestyles.</p>
<p>Warm Front Scheme</p>	<p>2001 – 2013</p>	<p>A government-funded scheme improves the heat and energy efficiency, while the scheme is up to £3500 per property</p> <p>Funding is mainly used for property improvement;</p> <p>Operates in England and Wales (The scheme was called Nest in Wales and provided by British Gas).</p>
<p>Warm Zones</p>	<p>2007 – 2009</p>	<p>Design to share energy efficiency with responsibility lying with the energy supplier company, local authority and ESCos;</p> <p>Defining the best temperature for indoor (22 degrees) and outdoor (18 degrees);</p> <p>Increased use of sustainable energy products.</p>

Renewable Heat Incentive (RHI)	2011 – 2018	A step scheme of the Feed-in-Tariff for sustainable energy technologies, such as solar panels and boilers; Designed to return up-to 12% heat energy to user; First incentivising sustainable tariff.
Green Deal	2012 – 2016	A government-funded, finance repayment scheme for energy efficiency improvements; Aims to be the first affordable programme for all British residents.

To illustrate the main schemes in the last thirty years (Table 3.3), the researcher compiled the table above. The UK government targets for energy conservation and carbon reduction is twofold. The first target is short-term, developed from the Kyoto protocol commitments in 2008. As a pioneer of the energy efficiency and sustainable implementer in the European Union, the UK government has agreed to reduce its domestic carbon emissions by 12.5% by the end of 2012 (DECC, 2013).

According to a report from the DECC in 2013, the UK has released 604.5 MT (million tonnes) of carbon emissions annually and 2,981.7 MT in total, which means the UK has successfully exceeded its target, reducing carbon emissions by 18%. The second target is long-term energy efficiency and sustainability goal. The UK government undertook to take serious action aimed at carbon reduction and become the first country to use

legislation to control the emissions of the six major components of greenhouse gas (Department of Energy & Climate Change, 2012).

This legislation is well known as the Climate Change Act of 2008. It contains the two aims of carbon use improvement and greater responsibilities for reducing carbon emissions and increasing the use of sustainable energy globally (Kern et al., 2014). By the standards of the carbon emission in 1990, the Act uses a ‘carbon budget’ to monitor and manage the volume of emission every five-years (Kern et al., 2014). The legislation outlines a plan to reduce emissions by 50% by 2025 and 80% by 2050 for the UK and the other EU countries.

3.4.2 Energy Service Companies (ESCos)

Energy Service Companies (ESCos) are energy saving companies which are defined as commercial organisations or businesses that offer a broad range of energy efficient products and services to reduce utility cost of the residents (Boait, 2009). ESCos also include a unique group of small businesses, as most of them are funded entrepreneurs, namely Green Deal assessors and installers, after the green deal policy was launched. Therefore, the owner-managers of ESCo facilitate direct communication with potential customers and this suggests more market opportunities with domestic residents to receive small business benefits. However, ESCos are also likely to face risks and resource constraints similar to those of other small or micro businesses.

According to the online database “Green Deal Approved” (<http://gdorb.decc.gov.uk/find-a-green-deal-supplier/>) in the official UK ESCos

database developed by the DECC, there are, in total, over 1400 ESCOs registered under the Green Deal scheme. Most of these ESCOs only provide one or two types of products and services. The products include boilers and heat pumps, solid and cavity wall reinforcements, loft insulations, solar panels, LED lighting, remote control software and energy efficient windows and, the services are biomass measurement, housing energy consumption assessment, Green Deal, ECO planning and implementation.

3.4.2.1 ESCOs and their Business Models

An energy service company is defined as:

“A company that offers energy services which should include implementing energy-efficiency projects (or other sustainable energy projects). Many ESCOs work on a turn-key basis.”

(Bertoldi et al., 2014)

The primary responsibilities of ESCOs may be summarised as including performance guarantees, financial consumption and assistance in the implementation of energy efficiency saving guarantees (Bertoldi et al., 2014). Performance guarantees require ESCOs to understand the customer requirement and the building’s status completely and, to guarantee the regular payment of the cost and bill by the customer (Bertoldi et al. 2014). ESCOs need to demonstrate the performance of their products and service in several years later to give more confidences to house occupiers (Marino et al., 2011). Financial consumption is the payback that allows the ESCOs to receive financial remuneration from the energy providers. The amount of remuneration is

straightforward and attached to the complete level of energy efficiency measurement (Hannon et al., 2013). Furthermore, ESCos are critical players, assisting the sustainable energy programme through the implementation of specific works including assessment, consultation, and implementation.

3.4.2.2 UK ESCos Industry

The first UK energy service firm was founded by the National Coal Board as one of its subsidiaries to develop more 'value added' to its formal products as well as services in 1966 (Fawkes, 2007). Moreover, it was also developed to outsource the services that the National Coal Board deemed irrelevant (Fawkes 2007). During this early stage of development of the UK energy service industry, the major energy service providers are sizeable international construction corporations and large UK energy suppliers, such as British Gas and SSE (Bertoldi et al. 2014). As a fruitful consequence of the EPC market founded in the UK in the middle of 1980s, many large corporations decided to set up ESCos as their subsidiaries to assist the operational and commercial activities of mother companies in the energy industry (Bertoldi et al. 2014).

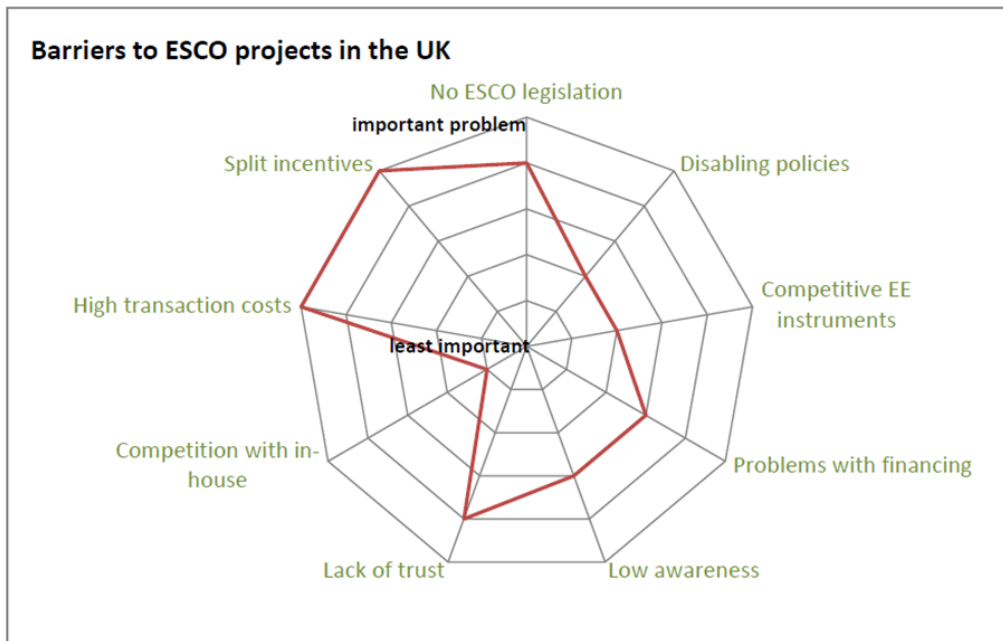
Since 2000, there have been an increasing number of ESCos set up by individual owner-founders and family businesses in the private sector during the restructuring of the UK electric power industry (Bertoldi et al. 2014). Scholars (Bertoldi et al., 2007; Boait, 2009; Marino et al., 2011) have pointed out several reasons for this phenomenon, such as the adoption of the Kyoto Protocol since 1995, development of the European Climate Change Plans (ECCP) 2000 and the demise of the CHP 2004 and, the increasing of

energy awareness on the consumer side. Furthermore, the growing of customer requirement to energy awareness tagger the growth of the energy service industry and the young ventures of the UK ESCos (Rodrigues et al., 2016). However, the actual number of the current ESCos is not clear and, the status of the UK ESCos market is acknowledged to be in a development stage (Wikler, 2000). The market share has not been evaluated since 2010 (Bertoldi et al. 2014).

Bertoldi et al. (2014) have also summarised several critical factors that are monitoring the market performance of ESCos including awareness and trust, financial indicators and barriers. Firstly, awareness and confidence have meant a lack of information for the customer and failed to explain the confusion about the notion of energy efficiency and key products. Additionally, limits in awareness and trust have led to more barriers in the finance of ESCos. Secondly, the national grant is declining and, rising competition in the market is making ESCos more sensitive to financial changes. Therefore, the ESCO Market Report (2013) suggests using a financial feature such as turnover to evaluate the potential power of ESCo's growth.

Finally, ESCos may face more barriers in its growth than expected. ESCos suffer the same regulatory barriers as other SMEs such as resource limitations, low-credibility and lack of support in employee skill and technologies. However, UK ESCos also face more unique obstacles shown in Figure 3.4 below.

Figure 3.4 Barriers to the UK ESCOs Growth



(Source: Bertoldi et al., 2014 pp.171)

Dealing with high transaction costs and split incentives are the two top priorities for ESCOs in the UK. Increases in the transaction costs caused by the increasing number of EPCs and standardisation of ESCOs are also lacking. As the former flagship of energy efficiency execution in the EU, the UK energy service industry has shown several characteristics indifference. Different from other successful energy efficiency executors, such as Germany and Finland, the UK energy service industry is dealing with more challenges. The challenges include the fact that ‘large manufacturers are the taxpayers, but also the polluters’ (Watterson, 1999 pp.242), alongside little regulatory and legal guidance that focuses on this industry (Boait, 2009) and the fact that some ESCOs are subsidiaries of large energy suppliers and international construction corporations who may be the sources of energy waste. Moreover, Hannon et al. (2013)

have found that the UK energy service industry is still in the developing stage since the variability and flexibility of UK ESCOs are high.

One observed negative consequence of the variability is that ESCOs take benefits from the government's green policy. However, they have failed to comply with their obligations to the customers who have submitted house energy saving applications. For example, a Cardiff-based energy service company was exposed as a scam firm by BBC television programme in 2013 because the firm never installed the bio-boilers promised after collecting money from three local property-owners and a government reimbursement from the Welsh government fund (Department of Energy & Climate Change, 2014). There are nonetheless several successful cases of UK energy service industry and ESCOs despite several issues being identified during the development of UK energy service industry. A list of issues caused by quick-change green energy policy is summarised as evidence for external environmental uncertainty (Appendix A).

3.4.3 Green Energy Solutions: Green Deal vs Energy Company Obligation (ECO)

This section compares two existing green energy service solutions, the green deal and the ECO.

3.4.3.1 Concept and Nature of the Green Deal

Since global warming has become a serious worldwide public concern, policy-makers in different countries have placed energy efficiency solutions, such as critical domestic

strategies in their political proposals. The British economy has been successful in its major industrial restructuring from dependency on large manufactory industries to an innovative- (tech-) oriented product and consumer-oriented services over three decades (Boardman, 2004; Elliott et al., 2008).

A major consequence of this movement is that the UK's environment and climate have achieved significant improvement. However, the low participation rate and increasing consumer complaints concerning energy efficiency programmes both indicate that both private energy firms and home users are losing their interest and patience in joining in. Additionally, the global economic recession such as the US Subprime Crisis 2007-2009, raises costs and risk-taking for both large energy supplying cooperation and small energy service firms in an uncertain environment. Green and sustainable energy policies may not provide or react to economic crisis rapidly and so fail to protect small businesses in energy service industries. It is understood that the UK energy conservation programme requires new guidelines that can either create more benefits to participants or achieve its environmental aim by 2020. The Green Deal is the latest policy although it reportedly failed in early 2015, as this research project recognises (Department of Energy & Climate Change, 2016).

Published by the DECC in early 2012, the Green Deal was designed as an integrated solution for climate improvement and a national economic stimulus plan. It is also the first policy that adopts many of the advantages of other EU countries' green policies. The Green Deal policy has an instant/short-term climate improvement aim to reduce

greenhouse gas emissions and home energy costs by cooperating with or creating more “green” firms.

Green Deal consists of a financial compensation scheme, a green job creation plan and market and, a government co-led practical framework. This policy covers 45 areas in the UK to improve the quality and energy efficiency of the individual residents’ housing properties through assessing and installing energy saving products and offering energy efficiency consultations. Described as the “Golden Rule” (Department of Energy & Climate Change, 2012), the UK government sets a high expectation for this pioneer to assist in the DECC’s long-term energy consumption programmes in the future (Department of Energy & Climate Change, 2012).

3.4.3.2 Essence of the Green Deal

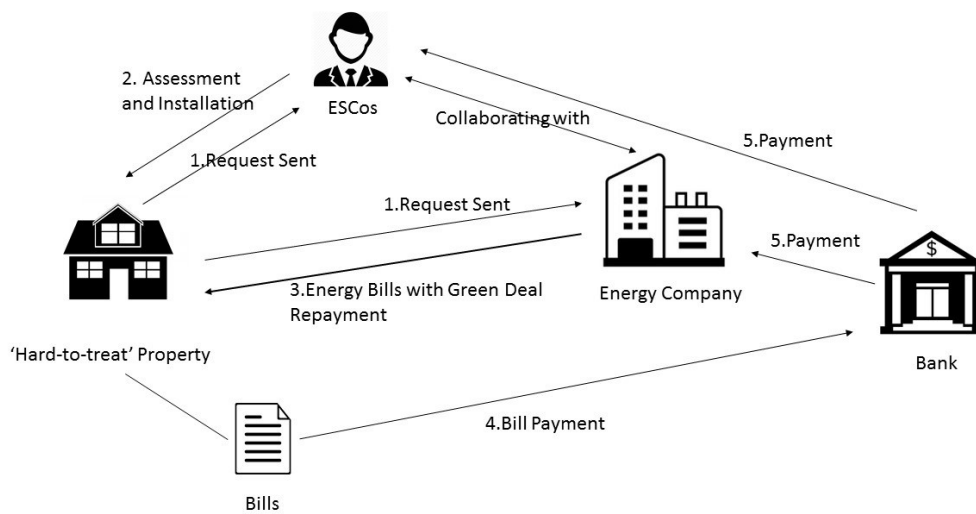
The Green Deal Home Improvement Fund (GDHIF) is the Green Deal’s financial compensation scheme. It offered an incentive to householders in England and Wales during October 2012 and July 2014. The scheme encouraged householders to assess their properties and further encouraged those who qualified to improve their energy conservation by offering incentives. It provides four core offerings to deliver at least £7,600 cash back to householders. The household report published by DECC in 2016 shows that the Green Deal Group received 21,041 different applications and more than 3,000 cases have been given funding amounting to £13.6 million in total. The most frequent application is for cavity wall insulation (75%), followed by boiler applications

(25%). Moreover, the Green Deal policy provides upfront energy efficient equipment, the cost of which is then attached to monthly utility payments.

3.4.3.3 Green Deal Context: An explanation

Figure 3.5 below has been compiled by the researcher to illustrate the main stages of the Green Deal. The figure illustrates the UK Green Deal scheme process. Firstly, the energy saving requirement of a 'hard-to-treat' house is identified and sent to either an ESCo or an energy supplying company. The ESCos or a subsidiary of an energy company then sends technical people to assess and install one or more energy efficient product(s) included in the Green Deal package in the house. The property owner does not need to pay for the installation at this moment. It is expected that this should significantly reduce the energy consumption of that house, resulting in a reduction in the energy bill, particularly electricity. Money from the reduced energy bill will be sent to a bank that will then transfer the money to the energy company for the energy use and to ESCos for the Green Deal device repayment on a monthly basis.

Figure 3.5 an explanation of the Green Deal process

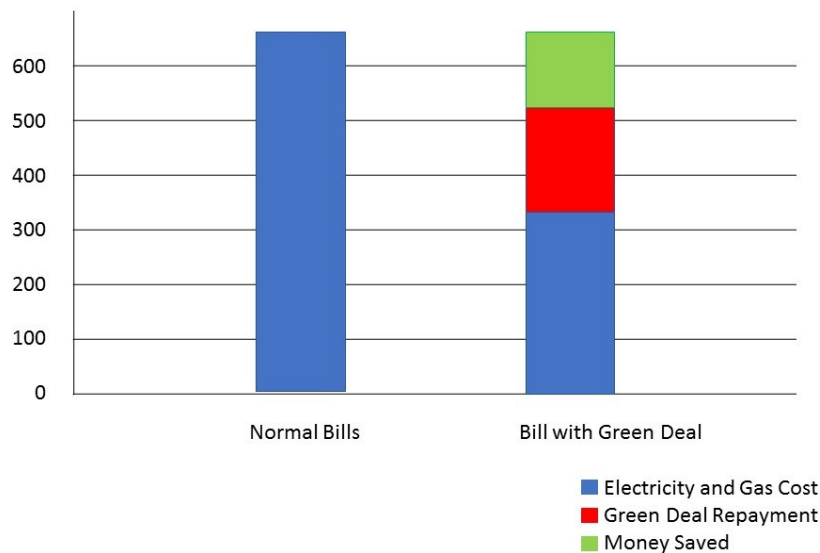


(Developed by the researcher)

The development of this Green Deal process aims to provide maximum protection of the property owner's rights and reduce risk to customers. However, it presents difficulties for the ESCOs and even energy companies on how to understand and execute on three points. Firstly, the design of the Green Deal process is complicated and non-linear, thus, the registered Green Deal implementers (ESCOs and energy company subsidiaries) may develop very different Green Deal solutions for their benefit. Secondly, the relationship between ESCOs and energy companies is blurry resulting in competition as opposed to collaborations with each other inhibiting the development of the Green Deal initiative. Finally, with the Green Deal repayment scheme, ESCOs need to wait a longer period to get the money of installed energy efficient products back and this may cause a financial crisis for the firms. This may be one significant reason for the failure of some ESCOs.

The Green Deal financial scheme also demonstrates how Green Deal users can save money on energy bills (Figure 3.6). Figure 3.6 below has been developed by the researcher to demonstrate how the GDHIF scheme reduces the energy cost for house occupiers. Figure 3.4 shows that the energy consumption of a property which is over £600 monthly drops to £500 with the Green Deal package. The £500 bill is comprised of two parts: the first part is the £350 for energy consumption cost and, the other is £150 represents the repayment costs for the installed Green Deal product(s). Consequently, the property owner prevents wastage of in-home energy and saves money on the new equipment repayment loan at 0% interest.

Figure 3.6 Consistency of the Energy Bills with Green Deal Financial Scheme



(Developed by the researcher)

Also, apart from the GDHIF, the Green Deal policy provides a long-term financial cashback scheme, whereby householders can earn money on a monthly basis back from their energy efficiency equipment and energy consumption (Department of Energy & Climate Change, 2014). Householders may submit a house reconstruction application to the green deal group within local authorities initially to reduce the upfront cost of energy efficient products requested by applicants. Subsequently, householders need to familiar with energy efficiency package identification and selection from the given “core offer” lists such as solar panels, smart meter, or general boiler or blind (Ritchie and McDougall, 2008). The energy providers then charge the green deal householder a lower cost fee while allowing them to claim cashback proactively as a bonus.

Green Deal also proposes to create more “green” job opportunities that either fill the requirement of the service provider or reduce unemployment. In a further green deal report, entitled “*A Green New Deal: Joined-up policies to solve the triple crunch of the credit crisis, climate change and high oil prices*”, the authors recommended that the policy ought to introduce more job positions to enable the reconstruction of the low-carbon industry (Simms, 2008). The Green Deal certificate test system offers a classification of service providers including the Green Deal assessor, Green Deal consultant and Green Deal installer. The assessor is responsible for checking whether a residential property is qualified under the scheme whereas the consultant and installer focus on the development of energy conservation offer and installation.

3.4.4 Energy Company Obligation (ECO)

ECO gives large British utility companies a legal obligation to provide energy efficient products, green energy service solutions and sustainable products to both industry and individual customers (DECC 2013).

Table 3.4 An Outline Description of ECO.

ECO	Description
Aims	<ul style="list-style-type: none">• The only existing energy efficiency programme• Designed to replace Community Energy Saving Program (CESP)
Start Date	January 2013
Implementer	<ul style="list-style-type: none">• Large utility companies• Small or medium energy service providers contracted with large companies
Content	<ul style="list-style-type: none">• Carbon emissions reduction obligation• Carbon saving community obligation• Home heating cost reduction obligation
Relationship with Green Deal	<ul style="list-style-type: none">• Similar bill payment scheme• Work with Green Deal together• Extra support for energy efficiency in low-income areas in the UK

Compiled by the researcher, Table 3.4 demonstrates that ECO is the sole existing energy efficiency programme in the UK, while the nature of the Green Deal is a green scheme. Implementers are mainly large utility companies who own about 95% of the British energy market as well as small and medium energy service young firms who work for the large utility companies. The construction of ECO creates several advantages based on a past energy efficiency programme, the Community Energy Saving Programme (CESP), to provide energy efficiency solutions (obligations) for either domestic and non-domestic consumers. The energy efficiency solutions are the carbon emissions reduction obligation, the carbon-saving community obligation and the home-heating cost reduction obligation.

Firstly, the carbon emissions reduction obligation centres on private residents, particularly for low-income UK residents. Installation of solid wall and cavity wall insulation is the main target of this obligation. The second obligation, the carbon saving community obligation, focuses on heat insulation products and services. This obligation has a sub-target that improves each rural community by at least 15%. Thirdly, the home heating cost reduction obligation provides maintenance and replacement of heating products, such as heat pump and biomass oven to UK households.

There are similarities and differences between the Green Deal and ECO. Both Green Deal and ECO are developed and implemented by the UK government to reduce carbon emissions and increase adoption of energy service technologies. Furthermore, neither of them require any upfront cost. The customer can install or maintain the home energy produces with money funded by the government and then pay back the loan through

their monthly electricity bills. However, the first difference between Green Deal and ECO is that the Green Deal is a voluntary scheme while the ECO is a compulsory initiative targeting large British utility companies. Finally, the Green Deal targets all British residents as potential customers, while the ECO prefers to improve in-house energy efficiency in low-income regions.

3.4.5 Reflection on the UK Energy Service Industry Development and relevant Green Energy Policy

Using the UK energy industry as the context requires the researcher to understand how the entrepreneurs interpret and use the green energy policy in their marketing activities. It also requires an understanding of how the ESCOs develop systems and processes to deliver the Green Deal programme to their customers. Furthermore, it allows comparisons to be made between UK ESCOs and other European countries, such as Finland and Germany.

The UK, as a pioneer in the EU, has released a number of the low-carbon and energy-saving policies and, organised several kinds of campaigns. These policies have created a new market and demand for green and sustainable products and have provided plenty of opportunities for large energy suppliers and independent ESCOs. Furthermore, previous green energy policy, such as the Warm Front and Low-Carbon Building Programme, has helped the government accumulate relevant experience and explore issues which have fed into the development of the latest policy, the Green Deal.

The Green Deal policy includes two categories a financial reimbursement and in-house facility improvement. The Green Deal Home Improvement Funds (GDHIF) were released with Green Deal to encourage residential consumers to refurbish their houses. However, the time limit of the GDHIF application has forced consumers to choose before understanding what the Green Deal is, while the slow cashback procedure and fraud have discouraged some residential customers. Apart from the financial reimbursement, Green Deal has also developed a user-protection scheme that has provided for the cost of house energy efficiency to be paid monthly. However, Green Deal has failed to distinguish itself from other energy-saving programmes that are provided by large energy suppliers. Therefore, Green Deal did not attract enough residential users as it failed to communicate its unique benefits. Although Green Deal was not a comprehensive green policy, it has still created market opportunities for UK ESCos.

UK ESCos include all kinds of firms that provides energy products and services to improve home energy efficiency, including installers, assessors, consultants, and financial advisors. Most ESCos are registered with the UK government to become Green Deal providers. Meanwhile, there are several ESCos have also provided large energy suppliers' energy-saving programmes. It may be that ESCos may need to merge their Green Deal services with others to survive.

This chapter has also compared two major business models of the UK ESCos the EPC and the ESC. Although the ESC is recognised as a better energy solution for residential and private homes sector, most UK ESCos still provide EPC to refurbish houses. This

may be because the ESCOs may not have enough capacity, skills and experience to provide ESC in the early stage of their businesses. Finally, the chapter considers the failure of ESCOs in the secondary data sample, following the collapse of the GD initiative. Although there are obviously many reasons for failure of the GD initiative reported in the national press, it is critical to this thesis that the small firm failures recorded in this sample also highlight a lack of marketing skill and knowledge, along with a lack of digital marketing expertise.

3.5 The Case Study Approach

3.5.1 Case Studies

The case study is defined as “*a serious research strategy ... to investigate a contemporary phenomenon within its real-life context when boundaries between phenomenon and context are not clearly evident* (Yin, 2015, p23). A research strategy means an adoption of various research methods to explore a specific social phenomenon-based issue (Bryman and Bell 2009). Carson (2001) claims that a qualitative research strategy helps researcher to develop an in-depth understanding of the potential relationship of the research objective and a specific social-based phenomenon by using multiple methods to analyse multiple sources of evidence.

Compared to other methodological strategies such as surveys and experiments, case study research observes and records what happens in real-life and case-based researchers are not allow to manipulate the phenomenon (Scapens, 2004). Advantages include collecting data from multiple sources and, a rich interpretation of the phenomenon in question, while embracing multiple research methodologies (Morgan

and Smircich, 1980; Scapens, 2004). The ontology of the case study approach considers that reality is a real-life construction which has concrete structure, phenomenon oriented rich content and human imagination and perception (Morgan and Smircich, 1980). Furthermore, case study research, particularly involving single case study, prefer to embrace multiple research methods of either qualitative method or quantitative, which extends knowledge of the interpretations while also increasing the accuracy of collected evidence (Yin, 1994; Scapens, 2004).

Yin (2009) also emphasised that data collection and analysis must “*rely on multiple sources of evidence*” while it is possible to embed “*all-encompassing methods*” as its methodology such as survey questionnaires, group interviews and observation (Eisenhardt, 1989; Yin, 2009). For instance, Kristal et al. (2005) divide 160,000 questionnaire respondents into a control-case group and an experimental group to discuss the efficiency of conducting a questionnaire study in the fast food industry. The case study is significantly adopted in the qualitative study to answer “*why*” and “*how*” form questions explore or explain the inner relationship and structure between the research objective and context (Ellet, 2007; Yin, 2010; Bryman and Bell, 2015). Yin (1994) believes that the case study allows a researcher to 1). explain simple or complex relationships in real-life; 2). discuss the phenomenon-based concern in real-life 3). describe the real-life intervention and 4). explore those situations that have not been clearly discussed before.

Research strategies using case studies have two categories: simple and multiple (complex) (Eckstein, 2000). In Yin’s (1993; 2009) view, the case study is a descriptive

method that uses either qualitative data or quantitative to understand the stand-alone phenomenon, thus it may be a longitudinal research process that allows other researchers to replicate the logic and theory. Yin (2003) believes that each case owns its unique characteristics using the simple case study that highlights the purpose and research gap in advance. The simple case study focuses on the individual research problem and represents the case, data and presentation in time-based sequence. Therefore, it naturally discusses the outcome and theory to illustrate the rationale (underlying logic) or uncover the theoretical relationship between theory and phenomenon (Adelman et al., 1976; Eisenhardt, 1989). However, it may be unsubstantial in theory building (Eisenhardt, 1989).

Prior scholars suggested that new theory can be built and verified via three approaches: armchair theorising (Gioia and Pitre, 1990; Alvesson and Kärreman, 2007), mathematical modelling (Kathleen and Melissa, 2007) and the inductive analysis of case study (Eisenhardt and Graebner, 2007). Theory building via case studies relies on the logic and rationale of induction and uses cases as an independent “experiment” to explore data and to identify a repeatable pattern in most of the cases selected (Yin, 1994; Kathleen and Melissa, 2007). Therefore, it would be difficult and controversial that using simple case study.

Alternatively, Eisenhardt (1989) stands for adopting multiple case studies in a theory building research by explaining that case study enables the researcher to extract and collect multiple types of data from several individual cases, before generalising the same pattern from multiple cases to offer an accurate and verifiable theory. Moreover,

case studies set up criteria to measure all the concepts involved in the research and hierarchical analysis of data (Simons, 1996). Case-based studies by Renko et al. (2009) suggested that the technological orientation of SMEs provides technological capacity, technological superiority to have an impact upon the market.

The overarching aim of this PhD research is to redefine technology in the EM theory and propose a new frame that explains the relationship between entrepreneurs, technology and marketing performance to ESCOs in the UK energy industry. Subsequently, its propositions attempt to discuss “how synergetic business model facilitates ESCo’s performance” and “how e-marketing tools can affect entrepreneur’s behaviour”, and “why entrepreneurship can break through the limit of SMEs to success” in terms of recording and representing the selected cases. Furthermore, compared with armchair theorising and mathematical modelling, the research decides to adopt the multiple case study to verify theory building.

Several reasons support this choice: Firstly, the research question focuses on the dilemma of technology in the existing EM theory and, attempts to restructure the meaning and scope of technology in EM. Secondly, its philosophical stance has discussed how this research explores several ESCOs which in different or similar situations; seek a pattern of using technology in marketing activities.

Although this research uses the UK energy service industry as a single case to verify the TEMP model, it requires using several UK ESCOs as multiple cases to validate the

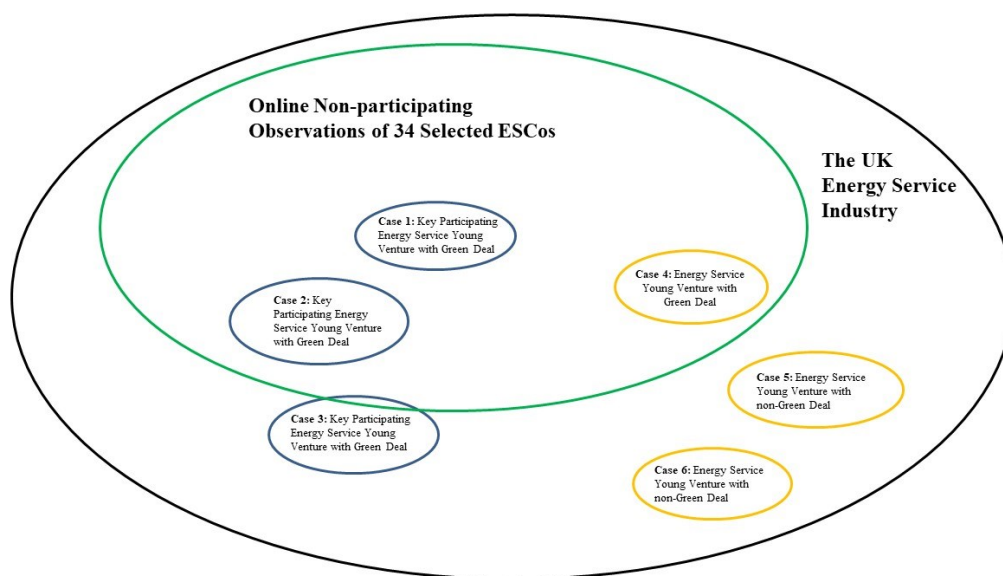
multiple technologies that adopted by different ESCOs in their different growth stages. Technology includes productive technology, communication technology and marketing (sales) technology. Finally, the proposed TEMP framework needs to uncover several relationships that including entrepreneurs and technologies, entrepreneurs themselves, technology adoption and government energy efficiency policies and, technologies and marketing performance. It also needs to be identified from two or more cases and then be verified later. Therefore, this research uses the multiple case study as its research strategy.

Validation of the case study strategy begins with constructing concrete a research question and proposition (Morgan and Smircich, 1980). Scapens (2004) reminds researchers to reflect on whether the nature of reality is suitable for construction and participated outcome is interpretative. Centring on the reliability and validity of this PhD research, the author of this thesis develops an iterative process for data collection that observes and notes the marketing technology of each participating ESCo, while primary data is recorded by using the voice recorder, digital camera. Then, transcriptions of collected data are prepared by computer-based software, while native-speaking researchers are invited to have peer check to improve the quality of data. Moreover, the validity of findings can be proved by data from multiple sources with a triangulation analysis.

3.5.2 Case Study Research Design

This research uses the UK energy service industry as a standalone case for case study development and embeds multiple ESCOs (six cases) to understand the impacts of TO and verify the dimensions of TEMP model (Figure 3.7).

Figure 3.7 Case Study Design for this Research



(Developed by the researcher)

The case study design figure (Figure 3.7) illustrates the steps of the case study in different circles where the area inside the black circle means that the case for this research is the UK energy service industry and the green circle means the selected 34 energy young ventures with the guidance of Green Policy for online non-participant observation. The selected ESCo young ventures must meet two criteria technology-oriented and Green Deal policy involvement in the green circle. For this step, the case study aims to collect various secondary data, such as web pages, Facebook and Twitter

dialogues and financial figures from all ESCo young ventures meet the criteria. Furthermore, several small circles marked as blue and yellow represent the interviews with entrepreneurs for the second step.

Although these interviews use the same question lists and follow the same case study protocol used by the online non-participant observation to collect same data, the key participating observations marked in blue emphasise value of the key participants and identification of emerging dimensions. Meanwhile, the semi-structured interviews in yellow highlight the findings of the literature identifying and emerging dimensions of TEMP model. Additionally, the case study design figure also demonstrates that the case study aims to collect evidence from case young venture A – D that are four of the 34 selected GD involved ESCo young ventures in demonstrating the TEMP model.

The evidence of case firms E and F populate the TEMP model with more non-GD ESCo young ventures in the energy service sector. Therefore, this case study design will demonstrate the contributions of TEMP model for not only a green and sustainable policy involved young ventures but also other non-green policy involved young ventures in the UK energy service sector. Yin (1994) set out the structure of the case study to be in five steps: (1). Developing case study protocol in terms of the research question, (2). Identifying the units of analysis and selecting cases, (3) Data Collection (4). Analysing data and (5). Development of a case study report (findings). Following Yin's (1994) case study design process, to achieve all these goals of the case study, the first challenge is the development of a case study protocol.

3.5.3 Developing the Case Study Protocol

Case study protocols have flexible forms to be developed for different business research since the research purposes are various (Bryman and Bell 2009). However, the development of case study protocol should concern all the case-selecting criteria and a coding book. Purposive sampling are used in this research project since the key factors that measure sales performance have not been recommended in previous studies (Shaw, 1999b). Furthermore, Patton (1987) has developed a case study protocol wherein each participant must own a firm of less than three-years-old or less, be a small or medium-sized firm, and use at least one type of marketing technology, such as a website, social media platform, E-transaction system or CRM. Additionally, the criterion specifies that the participants of interviews must be the key participants, either the entrepreneur (owner-manager) or the marketing manager. Furthermore, purposive sampling determines the size of participating case firms (Shaw 1999).

3.5.3.1 Developing the case selection criteria

Yin (2009) emphasises the importance of developing a proper case study protocol for qualitative research that is a roadmap. It helps to identify proper case study participants and keep focusing on the information related to research question. Development of this criteria can give the researcher insight into the core of the research, focus on proper participants and increase the reliability and credibility of the theoretical model effectively (Eisenhardt, 1989; Yin, 2010; Bryman and Bell, 2015). The criteria for the case selection is listed below (Table 3.5):

Table 3.5 Criteria for Case Selection

Criteria	Content in Research
Scope of the Core Concept	Entrepreneurial Marketing Green Deal policy Energy Service Companies (ESCos) Marketing Technology Methods
Firm Age	Less than Six Years
Geographical Location	England and Wales
Unit of Analysis (Case)	ESCos
Potential Participants	Owner-managers (Entrepreneurs) Marketing managers

Firstly, the criteria defined the scope of this research as EM, Green Deal policy, ESCos and technology. EM is a relevant new cross-disciplinary discipline that explores entrepreneurship from a marketing perspective. It is defined as a spiritual orientation that identifies and creates perceived customer value by identifying opportunity on the marketplace, resource leveraging and venture management innovation (Hills et al., 2008; Morris et al., 2005). Hence, EM studies are concerned with entrepreneurs and their firms' marketing activities. As its primary energy efficiency policy, the Green Deal was released by the UK government in late 2012, and the researcher should

perceive the research content and background by explaining the reason for the increase in the number of the UK ESCos (Dowson et al., 2012).

In addition, the Green Deal scheme also increases the opportunities and reduces the risks for entrepreneurs and founders to start their businesses in the energy industry (Dowson et al., 2012; Hannon et al., 2013). Young ventures founded by entrepreneurs are known as ESCos. According to the ESCos in European report by Ofcom (Panev et al., 2013) and GOV.UK (2015), the numbers of registered UK ESCos was 24 in 2009, while the figure rose to 2,500 in 2014 with most of them being small and medium-sized start-ups. Furthermore, ESCos shows the set of SMEs attributes such as quick response to change, founder (entrepreneur) involved in the frontline mission and, insufficient finance and resources, since being that ESCos are natural SMEs (Dongyan, 2009).

Technology inclusives in TO is twofold: productive technology in NPD and innovation and innovative marketing technology (Chaffey and Ellis-Chadwick, 2012; Panev et al., 2013). Panev et al. (2013) believe that technology is important relate to EM knowledge. Therefore, this PhD research has decided to use the UK energy industry and ESCos to study the EM by constructing a proper 'marketing-technology-firm-policy' relationship to extend knowledge of the EM. As discussed in previous literature review the sociological and historian types of technology views argue that effects of technology be multifaceted and much important in social science studies (Bijker et al., 2012).

Secondly, the criterion limits age of the participating firms should less than six years since this PhD project decides to focus on start-ups and young ventures of ESCos (European Union, 2014). Multiple previous entrepreneurship and entrepreneurial-studies have selected start-ups as participants to validate theories (Shapero and Sokol, 1982; Gilmore and Carson, 1999; Stokes, 2000; Witt, 2007). One reasonable explanation is that start-ups share several attributes with EM, such as risk-taking, environmental uncertainty and opportunity seeking (Shapero and Sokol, 1982).

Moreover, young ventures and start-ups grow in a dynamic business environment and lack financial investment; thus, ventures prefer adopting technology as competitive advantages and giving fast response to opportunities on the market (Hansen and Eggers, 2010). Therefore, according to the description of SMEs in the European Union (2014), the research has decided to select those young ESCos under four years. The other reason is that the total number of ESCos is not clear in each member state of the European Union (Bertoldi et al., 2007).

Alternatively, Bertoldi et al. (2007) suggest that research on ESCos may use the firm age or annual profit as standard to divide ESCos into the different stage. Since there is no pattern for the annual profits of the UK ESCos, the research has decided to use the firm's age as a criterion. Furthermore, the author of this thesis has found that several ESCos are transmitted from other industries such as financial firms, high-tech software companies, family businesses or even international commercial companies. However, these transmissions all happened in 2012, the year that the Green Deal policy was released. Therefore, the criterion decided to use the year 2012 as a starting point.

Thirdly, Hannon et al. (2013) have suggested that the location of a participating company is one crucial criteria to select a case study firm, so this research sets criteria to only select ESCos in the UK that includes England, Wales, Scotland and North Ireland. Prior researchers found that the development of UK ESCos is different from the most EU countries despite the fact they are a Union. As have been seen in previous studies, these differences include focusing on residents, providing CHP and solar terminals as major products and establishing networks and partnerships with each other (Hill and Wright, 2000; Zhou et al., 2005). UK ESCos should adopt the most cited theory from Germany or Italy because there is a lack of a general theory for the UK energy industry (Bertoldi et al. 2009).

ESCos in England and Wales are driven by communities or about the sustainability of the public sector, such as the RE:FIT programme in London, while Scottish ESCos and received financial and political supports on B2C marketing (GOV.UK 2014; Bertoldi et al. 2009). Moreover, North Ireland has completed the electricity market liberalisation and supplies sufficient low-price electricity since 2005 and industries have shown a growing interesting on CHP. Therefore, ESCos mainly supply the CHP to multiple industries while also taking part in various industrial processes in North Ireland (Bertoldi et al. 2009). Therefore, it requires conducting multiple case studies to access the attitudes and understandings from entrepreneurs' perspectives.

Fourthly, the term Energy Service Companies (ESCos) is a collective concept that involves the set of different business types, such as energy product installers, Green Deal assessors, energy solution consultants and even sustainable service providers.

Their personal opinions and experience are important in constructing the knowledge of EM in my PhD research project. Yin (2013) advised that qualitative researcher with case study can use an organisation as a unit of analysis to study the social phenomenon based problem. Rather than only using owners or other employees in firms, adopting ESCos as units of analysis enables the researcher to understand how technologies constructed differently in different firms.

Finally, the primary data is collected by interviewing founders or other employees in the sampling ESCos. Since the PhD project uses constructivism as a research philosophical foundation, it has also defined the research units as ESCos. Human participants, such as owner-managers, marketing managers and other employees, has been interviewed to collect personal cognition and experience that helps to construct the real effects of technologies on ESCos. Furthermore, the interviewer has requested the secondary data of the ESCos such as the operational reports, financial reports, product and project brochures or even the copy of conference records at the end of the interview. The secondary data from non-participant observation is also used to inform the case studies and therefore selected firms are required to use at least one digital marketing resource. This data provides vital information on each ESCo on the way they marketed using digital technology and, supports holistic approach to collecting data for the case study (Yin 2009; Saunders et al., 2006).

3.5.3.2 Developing the coding scheme and coding book

The coding book (Table 3.6) shows dimensions and sub-dimensions in sequence. This research has developed a multidimensional coding book for the case study. The coding book contains several major dimensions, including ‘entrepreneur’s idea and intention’, EO, TO, ‘customer needs’, ‘marketing performance’ and ‘environmental factors’. Each dimension also contains multiple sub-dimensions that provide specific factors aiding data collection and analysis. Sub-dimensions hence refer to dimensions that lead the researcher to collect and classify the secondary data.

Table 3.6 Coding book for Case Study

Major Theme Name	Subtheme	Definitions
Entrepreneur’s idea and intention – The original idea that entrepreneurs have before they establish the ESCos	Entrepreneurial idea	The original/rough idea that drives the entrepreneur to start a business or develop a new product (Kasouf et al., 2015)
	Entrepreneurs’ intention	Personal attitudes, wishes and desires that influence one man’s choice of entrepreneurship as well as entrepreneurial behaviour (Van Gelderen et al., 2008).

<p>Entrepreneurial Orientation (EO) – Studies of how the entrepreneurs,</p>	<p>Motivation</p>	<p>Entrepreneurs’ ideas, expectations or intentions (Pettersen and Tobiassen, 2012)</p>
<p>their entrepreneurial characteristics and, experience impact on the firm’s marketing</p>	<p>Entrepreneurial Experience</p>	<p>The founder of firm's own entrepreneurial experience in founding or participating in the founding of another firm. (Westerlund and Svahn, 2008; Morrish et al., 2010)</p>
<p>activities.</p>	<p>Work Experience</p>	<p>The founder's previous work experience (Fillis et al., 2003)</p>
	<p>Entrepreneurial Characteristics – Risk-taking</p>	<p>Either positive or negative marketing performance may encourage the entrepreneur to take more risks to change the current status of a firm (Morrish et al., 2010)</p>
	<p>Entrepreneurial Characteristics – Pro-activeness</p>	<p>The entrepreneurial firms' attempt to develop new products, restructure operating or marketing processes and learn new marketing methods from other firms (Renko et al., 2009)</p>

Entrepreneurial Resources	Identifying several entrepreneurial capitals, including financial resources such as government funds and VC investment and non-financial capital such as operational, human, technological, social and symbolic capitals (Huang and Wang, 2013).
Networking	Term includes the networks developed with local authorities, large energy companies, other ESCOs business partners or even competitors. The development of networks helps an ESCo to acquire/create new business opportunities (Carson et al., 2004; O'Dwyer et al., 2009)
Partnership	A closer partnership with authority or industry, assists a firm to access greater levels of commercialisation (Stam and Elfring, 2008)
Marketing Knowledge	An investigation about how much marketing knowledge an entrepreneur has in terms of knowledge of target market, firm age and size, customers

		and, how a firm finds the first business opportunity (Moriarty et al., 2008; Morrish and Morrish, 2011; Rowley and Jones, 2011).
Technological Orientation (TO) - the use of sophisticated technologies in	Innovativeness	The productive technologies used in product development and how they differ from that of competitors (O'Dwyer et al., 2009).
NPD, the proactive development of new technologies and the creation of new product ideas. It also refers to the use of an ESCos' technical	Technological Superiority	Technological superiority helps a firm differentiate in NPD, and maybe a source of competitive advantage for an ESCos, facilitating technological leadership in the market (Atuahene-Gima and Ko, 2001; Jeong et al., 2006)
knowledge to build new technical solutions to answer and meet new needs of the users	Word-of-Mouth (WoM) Marketing	Referrals of products/services by existing customers to potential customers. This is seen as an effective way to acquire a first business opportunity for ESCos (Stokes, 2000; Franco et al., 2014).

New Product Development	This refers to the type of product/service provided by an entrepreneurial firm and how many. It also refers to what technology is used to develop and sell new products (Stokes, 2000; Bjerke and Hultman, 2004).
Technology Adoption in Decision-Making	It focuses on entrepreneurs' technology adoption in decision-making, that is, what technology should be used for NPD, operational, management and marketing (Collinson and Shaw, 2001; Fillis et al., 2017)
Administrative marketing	Traditional marketing methods adopted by ESCOs, such as conferences and exhibitions, newspaper advertisement, radio, and direct marketing (Hills and Hultman, 2008; Miles et al., 2015).
Digital Marketing	An understanding of all marketing activities involving the Internet or the digital environment (Alford and Page,

		2015). For example, web, Facebook, Twitter, mobile phone and tablet or e-CRM.
Customer Needs – an understanding about customer/market needs by seeking and communicating with various customers to transform products into business opportunity	Customer Identification	An investigation into how an entrepreneurial firm finds and engages new/potential customers (Alford and Page 2015)
	Needs Finding	Understanding what motivations customers hold, thereby helping the entrepreneur identify proper products as well as marketing approaches (Eggers and McCabe, 2016).
	Customer Satisfaction	Allows customers to leave their comments; positive comments may bring more business opportunities while negative ones may have an adverse effect (Ramanathan et al., 2017)
	Customer Loyalty	Customers post or retweet products and services information via social media or re-buy products and services

		or recommend brands to their friends (Franco et al., 2014)
Marketing Performance	Marketing Performance	A critical factor that measures the performance of the ESCos' marketing activities and provides information that supports entrepreneurial decision-making (Moriarty et al., 2008).
Environmental Factors – external environmental factors that affect ESCos' marketing methods and actions	Green Policy	Provides information and understanding about the Green Deal finance policy (Stokes, 2000; Morris et al., 2002)
	Environmental Uncertainty	Unexpected changes which happen to ESCos, such as an economic recession and changes within their industry (Stokes, 2000; Morris et al., 2002)
	Venture Capital Investments/ government funds	An investigation into the role VC and authorities play in the ESCos' marketing activities (Minniti and Lévesque, 2010)

First and foremost, the coding book explores the original idea that the entrepreneurs had on establishing their ESCOs and the entrepreneurial intention that influenced said entrepreneur to start a business or develop the product/service. Entrepreneurs' intentions include personal attitudes, desires and wishes that influence one man's choice of entrepreneurship as well as his entrepreneurial action (Van Gelderen et al., 2008). Secondly, the Entrepreneurial Orientation (EO) identifies the characteristics of both entrepreneurs and firms, including motivation, previous work and entrepreneurial experience and personal expectation for marketing performance, to check whether marketing performance improvement is driven by owner-manager's entrepreneurial knowledge as well as the firm's high expectations. Furthermore, the researcher has also investigated the firms' products and services information. Networks and partnerships are visible in this sector and, involve various aspects including working with local councils, large energy suppliers and other ESCOs.

Thirdly, development of deeper knowledge of TO begins with the understanding of the level of innovation in the firm. Thus, TO can require creative skills to decide what and how much information to display online (Chaffey and Ellis-Chadwick, 2012). The necessary information on digital marketing channels helps managers to deliver their messages, build trust and engage with customers (Chaffey and Ellis-Chadwick, 2012). Moreover, it improves the competence of the digital marketing method for a firm that can be analysed by monitoring search engine rankings and hyperlinks to websites and social media.

Fourthly, the coding book evaluates the performance from the customers' perspective by checking customer satisfaction and customer loyalty. Customer satisfaction can be analysed from customer's comments on the websites and social media. Customer loyalty refers to previous customers who may re-purchase products or services or introduce a firm to their friends. Their re-tweeting behaviour is considered as an effective approach to calculating customer loyalty.

Finally, the coding book also includes several external environmental factors: policy, and attempts to understand how entrepreneurs understand, interpret and use green policies, particularly the Green Deal policy, in their firms' marketing actions. This research also considers new ventures search for government funding or Venture Capital (VC) investment to leverage advantages for ESCos.

The researcher thus proposes that an exploration of the relationships between multiple sources of information, such as online news, online case studies and newsletters, and marketing performance helps the researcher determine whether the content supports effective marketing opportunity or not. There is a paucity of studies which discuss functions of free knowledge, such as the tutorials provided by websites and information on Green Deal policies. However, early indications of the research and evidence from three key participating interviews (Case B) indicate that providing useful information as free content helps attract customers.

3.5.3.3 Demonstrating the TEMP model Dimensions

Use of the research strategy case study can improve the consolidation and validity of the TEMP model development. First, literature evidence of EM and TO identifies dimensions of the TEMP model and six energy service young ventures and their entrepreneurs are investigated to collect rich data from different perspectives. Later, the collected data is used for demonstrating existing dimensions, identifying emerging dimensions and developing underpinning descriptors. Inspired by Jones and Rowley (2009)'s procedure to develop descriptors for the EMICO framework, this research develops descriptors which combine descriptions from prior literature and interpretations given by the participant entrepreneurs to enhance consolidation of the TEMP model.

Moreover, the validity, particularly internal validity, are enhanced by the participant entrepreneurs' own words known as 'en vivo' statements. Using semi-structured interviews participant entrepreneurs were requested to explain each dimension using their own interpretation and words. Following the research logic suggested by Jones and Rowley (2009), the researcher showed the cards to each participant (entrepreneurs from Firms D, E and F) with dimensions at random and the participants were requested to explain the reason if there was self-contradictory interpretations of some dimensions. This provided additional validity and 'member checking' by referring back to the participants to re-clarify points made (Carson et al., 2001).

3.5.4 Brief Description of the Case Study Firms

According to the UK official Green Deal database (gdorb.decc.gov.uk), 2,176 firms have registered with the Department of Energy and Climate Change (DECC) (Table 3.7). The database (Table 3.7) shows that 141 ESCos provide their products and services for businesses and residents in England, while the other 166 ESCos cover Wales and 1869 ESCos are delivering services in Scotland and North Ireland. Despite the ESCos located in both England and Wales being only 14.1%, they contribute 0.63% of the domestic industry GDP to the national economy and provide approximately 73,5000 jobs (eFuture ESCO Annual Report, 2014, p.10-12).

Table 3.7 A Summary of UK ESCOs

Location	England	Wales	Scotland	North Ireland	Total
No. of Firm	141	166	1,830	39	2,176

(Source: gdorb.decc.gov.uk; 22-July-2015)

UK government energy policy such as Green Deal encourages the increase of ESCOs in England and Wales. Regarding the BBC and Guardian's news reports, the latest sustainable and green energy policy, Green Deal, has increased the setup number of the UK young energy service ventures since October 2012. However, the intrinsic drawbacks of SMEs, commercial fraud and improper selling method has reduced the number of ESCOs in their early four years. For example, there is a list of sixteen energy service start-ups that participant in an academic research project of the University of Nottingham in 2011. However, the same list cannot be used again for other similar

ESCo-involved research because one-third new ventures on the list have since been shut down. One new venture that in Cardiff has been reported to be involved in several cases of fraud; one new venture has changed its business and turned into the mobile industry and, another three start-ups are shut down with one possible reason being continued bad marketing performance since 2012.

Table 3.8 Criteria for Selecting GD involved ESCo young ventures

Criteria	Requirement
Industry	Energy Service Industry
Sources	UK Government Database (online): http://gdorb.decc.gov.uk/find-a-green-deal-supplier/
Firm Age	Five years or less
Firm Size	Micro (0 - 10), Small (11 -50), Medium (51 - 250)
Firm Status	Independent
Business Scope	England and Wales
Interview participants	Founder-owners of the energy service young ventures
Policy involved	Green Deal, ECO or other energy efficiency policy, e.g. CHP and EU climate and energy package 2030.
Marketing Approach	Traditional marketing Own websites* for business purpose at least

Note: Website* means the website, Facebook and LinkedIn page and Blog that are developed and used for commercial purposes.

Shown in Table 3.8, this research uses the UK government online database (The Green Deal Approved) to list 149 energy service companies (ESCos) that are registered and provided Green Deal services. Moreover, 34 new ventures that were founded in England and Wales area since 2012 have adopted at least one e-marketing method in their daily marketing activities. Geographically, ESCo young ventures source from the East coast and Southwest coast of England, London Greater and the East and West Midlands areas. Furthermore, four selected ESCos locate at North and South Wales. Moreover, the data shows the 29 start-ups that have less than 50 employees and belong to the small business sector, while the firm size of other five select new ventures are medium employing up-to 270 people. Therefore, the select samples are valid to represent the ESCos in England and Wales. For qualitative content analysis, secondary data has been suggested for collection from multiple sources and run a comparable cross-category check to a preliminary theme (Forman and Damschroder, 2008). Since the overarching aim of this research is to understand how information technology helps the entrepreneurs to find more opportunities and facilitate marketing performance, the author of this thesis has decided to collect data from the Internet (see Appendix B).

It (Appendix B) describes the secondary data collected from eleven sources including commercial websites, Facebook, Twitter, Google+, LinkedIn, YouTube, iPad application, online news and case study, financial reports and firms' brochure and leaflet. The website is an essential tool that provides information about the firm, product

and case study and, also embeds several social media to facilitate communications with customers. Subsequently, some selected ESCos have developed videos and posted on YouTube to introduce the vision of their ventures or advertise the new features of new products and services. Two ESCos have also developed the iPad applications to collect customer feedbacks and simplify the purchasing process. Furthermore, ESCos' documents, such as financial documents, product brochures and annual reports for the government, are downloadable from their official websites and third-party company information check websites, such as GOV.UK, DueDli, Endole and UK company credit check.

Earlier, the first phase of the research project involved a pilot interview with a key participant and expert in the field of sustainable energy ESCos, including research carried out at a large energy industry exhibition at the National Exhibition Centre (NEC, Birmingham) where potential sample firms were identified. Earlier, Blythe (1999) has manifested the difference of expectations between exhibitors and visitors by using UK commercial exhibitions as research contents, while filling a gap in the otherwise insufficient existing marketing research into the UK trade exhibition. Furthermore, another value of the exhibition study is to discuss the possibility and guidance to implement qualitative research with exhibitors, such as interviews, survey questionnaires and observation (Jung, 2005; Jin and Weber, 2013).

Collection data on conferences and exhibitions is hence beneficial to the case study, although the qualitative researcher may notice that it is easy to find key participants to communicate, increase the success rate to obtain answers or even implement a

comparable study among several firms (Blythe, 1999, 2009; Jin and Weber, 2013). Apart from meeting new participants on exhibition, this approach has also located more participants by email and communicating via telephone.

3.5.5 Research Ethics Concerns

The fundamental connection between all relationships in the social world is personal interests and benefits (Brenkert, 2008). Participants may reject, subconsciously, an invitation to participate in unknown research to avoid all potentially dangerous risks and loss of interests (Brenkert, 2008). Therefore, it is the full responsibility of researchers to forecast all possible harms and demonstrate to the participants, such as entrepreneurs, other employees and policymakers.

The first concern is to protect the participant's privacy and autonomy. The University of Birmingham provides a specific research ethics code that helps the researcher to collect data legally and protect the rights of the participants. Reviewed by the supervisor and then approved by the university's ethical department, the questions and activities of all materials have been discussed before contacting potential participants that include entrepreneurs and other employees. Secondly, full information about the research processing has been informed to all participants in the head and left enough time to the entrepreneur to decide whether participating or not. Although the author of this project uses the semi-structured interviews to ask laddering questions, it should never ask the details in energy consumption; interviewee's sensitive personal information or social contact methods.

Thirdly, research must maintain the confidentiality of participants' empirical data carefully even if this research completed since it still may be misused. There are many threats which may cause the data to leak or be lost such as a laptop missing, inappropriate data storage, fire and another disaster. Therefore, the taped records of the interview conversions and collected secondary data are maintained in an encrypted exclusive hard drive. Finally, it is seen as harm-free research behaviour to the participant since the entrepreneurs and marketing managers are not involved in any physical experiment and, they are informed that have the right to terminate the collaboration when they feel any uncomfortable.

Before the research data collection, the researcher emailed the entrepreneur (owner-manager) of the firms to explain the purpose of the research and ask to obtain the necessary permission. The letter explained who the researcher is and the supervisory team members, so providing contact details. Furthermore, it has also described the main process of interview and the rights of the research participants, including not answering certain questions, or pausing or stopping the interview at any time and withdrawing from the research. The letter has also explained the potential benefits for the company.

Entrepreneurs and marketing managers always have the right to terminate an interview if they felt uncomfortable. They are contacted again for feedback after reading their interview to ensure content validity. Participant ESCOs' information and collected data are hence used anonymously in all publications and reports. The letter of introduction has explained their right to withdraw at the outset while the authors of this thesis have repeated the information before each interview along with all other ethical

considerations. Moreover, the interview participants are informed that they have rights to withdraw in one month after their participation.

Another critical concern in the research ethic is the confidentiality of data. All identifying data about research participants and the organisations they represent are anonymised and provided with identifiers i.e. Company A, Owner-Manager, Company B Marketing Manager etc. A personal agreement informs the participant that their names are replaced by their current job title, such as owner-manager A,B,C; marketing manager A,B,C etc. Furthermore, the companies involved in the research also use aliases such as Firm A, B and so on. The research does not use any obvious description of the characters and traits that might reveal the identity of the participants.

3.6 Data Collection

The data collection process includes the following approaches: online non-participant observation and semi-structured interviews. Data is analysed using clerical analysis and also NVivo software for both secondary data and interview data analysis.

3.6.1 Method One: Online Non-participant Observations

Non-participant observation has been widely used to understand incidents happened in virtual communities, customer traffic and preference of a website and interactive communication between entrepreneur and potential customer (web user) (Bíró, Botzenhardt and Ferdinand, 2014). This research uses non-participant observations to collect various data from 34 ESCo young ventures' websites, social media channels,

financial figures and company reports published on the third-party company information website, CompanyChecker.com, and ranking on the search engines. In this research, non-participant observation was used to gain a fundamental understanding of the level of technology used to carry out marketing activities in the UK ESCos, a recommended approach for gathering data for case study research of small firms (Carson et al., 2001). Comprehensive data collection from a variety of sources and viewpoints were used to increase content validity (Carson et al., 2001; Yin, 2009; Saunders et al., 2006). This data collection was useful to gain critical insights as to how firms in the sample marketed using digital marketing. This included the following: websites, Facebook pages, Twitter conversations between entrepreneurs and their customers and marketing performance reports from the third-party company information agencies, the Companycheck.com. This data is used to help the researcher to corroborate the dimensions identified from previous literature, to choose the participant firms for the case study and, to inform each case study in the chosen sample as discussed in section 3.5.3.1.

The selected 34 UK energy service young ventures provide rich data on their websites to give browsers more confidence by demonstrating the ventures' histories, background stories and advantages of the products and display their networks and partnerships with large energy suppliers and other ESCos. Therefore, the data collected on the web pages 'company history', 'our team' or 'about us' contains rich information about entrepreneur's motivation, several entrepreneurial characteristics, technology superiority and marketing method identification on 34 young ventures' websites.

In addition, ESCo young ventures prefer demonstrating their partnerships, such as Scottish Power, British Gas, other UK ESCos and local counties, to describe their business/marketing activities. NPD and innovation data are collected from most young ventures of the selected ESCos (32/34) while this data demonstrates what technology is used and, whether or not information explored by new market opportunity and customer requirement has contributed to NPD. Furthermore, most young ventures' websites (27/34) contain data about green and renewable energy policy, such as Green Deal and ECO. Collecting data about green and renewable energy develop an in-depth understanding of how does external environmental factor impact on the UK ESCo young ventures' marketing activity and performance. However, websites provide limited data about customer needs and the relationship between entrepreneurs and customers. This research has thus decided to collect further data on social media channels, including Facebook, Twitter and LinkedIn.

Data collected on the social media channels can be used as evidence to understand the selected ESCo young ventures' marketing activities since the posts, users' comments and dialogues between entrepreneurs and customers have time-stamps that show when these activities happen and in what sequence (Peng et al., 2012). Most links of the young ventures' social media, such as Facebook, Twitter and LinkedIn, are found on their websites, while the social media channels of some selected ESCo young ventures that are not listed on their websites but identified on the Google search engine by searching for young ventures' names as keywords. This research uses data collection tools as follows with each of the 34 selected case firms:

- Octoparse - this is web page capture software which collects data from websites. To collect this data, the researcher applied the URL of each firm website into the software and completed analysis of each website. For example, this software helps the researcher to classify the information on the website into categories regarding the data formats, such as texts, images, audios and video clips.
- NCapture - this tool is used as a web browser plug-in to collect data from social media sources, including Facebook, LinkedIn and Twitter. This allowed the researcher to collect the conversation data between the entrepreneurs and customers from the start of their first marketing activities (timeline).
- Crazyegg - this mobile marketing software allows for the collection of customers' digital footprints from companies globally. The researcher used this software to collect data consisting of marketing activities (traffic and frequency) of each mobile application used. This research was carried out in each company as all of them used social media.

The captured data was coded and captured in several formats, for example, word, pdf, jpg and html web pages. A summary of the current status of digital technologies used for each case firm is provided at Appendix B.

The collected data, including young venture annual reports, abbreviation financial report, stakeholder and company status reports, has also been collected from a third-party company information website, CompanyChecker. Ranking the 34 ESCo young ventures on two mainstream search engines, Google and Yahoo!, are observed to understand how entrepreneurs identify customer needs and how, conversely, customer

identify the ESCo young ventures as well as their advanced technology involved in new products.

3.6.2 Method Two: Data Collection with Interviews

Interviews are seen as a typical interpretivist research method, which develops a conversation-based questionnaire to query the participant's subjective views of phenomena (Ryan et al., 2002). Cooperating with other methodologies, it allows the qualitative researchers to adopt flexible the method interview in multiple forms (Saunders et al. 2006). Semi-structured and in-depth interview excel in the theoretical frame and models verifications (Luan, 2010; Bryman, 2012), whereas the structured interview is commonly adopted in either quantitative research such as statistical surveys or qualitative study such as focus groups (Whiting, 2008).

The semi-structured interview method provides a more flexible way to lead the participant to sharing stories on several selected topics and extend understanding level of the underlying concerns of reality (Bryman 2012; Whiting, 2008). Compared with the structured interview the preparation of a fixed question list is not required but a set of the relevant research themes (Saunders et al. 2006). Constructivists prefer to adopt the semi-structured interview as research tools in social-phenomena based research because it has the responsibility of recognising multiple perspectives of the research objective (Ritchie et al., 2013). Furthermore, constructivists believe that the outcomes of the semi-structured or in-depth interviews are educable and transformative (Ritchie et al., 2013). Yin (1994) has discussed the qualitative interview with case study as “a key material for gathering information”.

Using skills such as laddering questioning during the interview process, the researcher of this PhD project leads the participants to share stories on their firms' growth, technology adoptions, and marketing activities and performance since the ESCos founded. The participants construct their knowledge and verify the validation of the selected case on multiple aspects by sharing their narratives, such as identifying whether their ESCos with the Green Deal programme or not. Using semi-structured interviews also allow the researcher to focus on the relevant information straightforward (Saunders et al. 2006). Entrepreneurs may share their stories equally, so it is the interviewer's responsibility to lead them to share more stories on, such as, their entrepreneurial experience, technologies in NPD and marketing, and problems and challenges and their solutions. Furthermore, semi-structured interviews naturally allows for asking further questions in order to re-clarify (Carson et al., 2001).

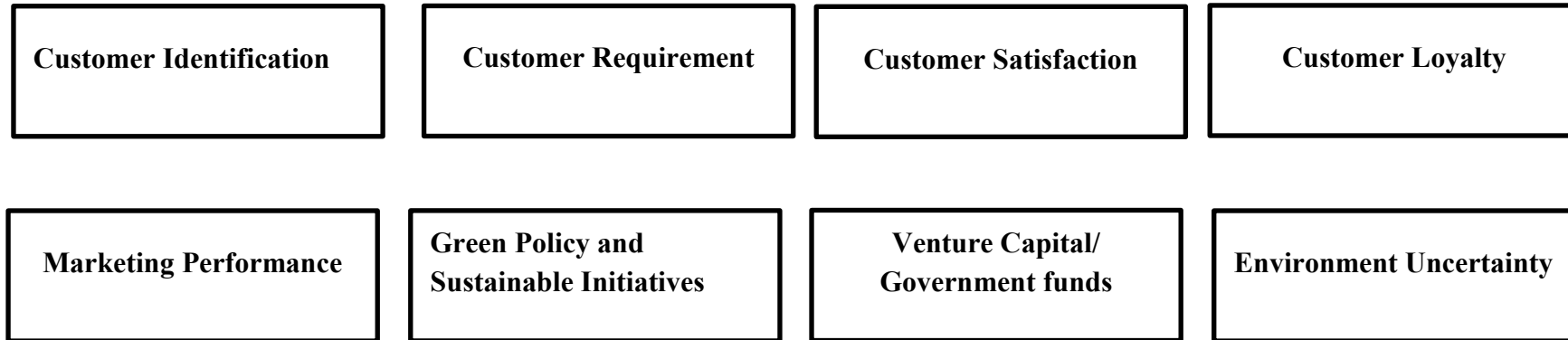
During the interview stage, the research found that entrepreneurs were reluctant to share their views on the associated challenges and issues for their firms (ESCos), in particular, information about their customers and partnerships. However, the semi-structured interview technique allowed the researcher to probe more deeply and to try to access this data (Bryman 2012). The research was guided also by prior scholars who advised the researcher to type the interview or take more notes during the interview to strengthen its external validity (Bryman 2012; Saunders et al. 2006; Yin 2009; 2003).

Figure 3.9 demonstrates the cards with dimensions used in semi-structured interviews to give a visual cue and help the participant to provide relevant answers during the interview dialogue. The dimensions are keywords and terms identified from previous

literature and non-participant observation. The researcher picked up one card each time randomly and put the card in front of the participant. Meanwhile, the researcher asked the relevant interview question for the participant. Then the participant provided answers in relevant to the dimension on that card. The researcher would choose another card to start a new topic until all the cards were finished.

Figure 3.9 The Cards with Dimensions used in the Interviews

Entrepreneurial Idea	Entrepreneur's Intention	Motivation	Entrepreneurial Experience
Work Experience	Proactiveness	Risk Management	Entrepreneurial Resources
Innovativeness	Technology adoption in Decision-making	Technological Superiority	New Product Development (NPD)
Networking & Partnership	Digital Marketing	Search Engine Optimising (SEO)	Partnership
WoM Marketing	Administrative marketing	Marketing Information	New Product Development
Technology supports Decision-making	International Marketing	Direct Marketing	Search Engine Advertising



(Developed by the researcher)

Using the Card Game Method in Semi-Structured Interviews

Semi-structured interviews using the card-based method to guide purposive interview participants to provide more information in terms of content on cards. Muethel and Saunders (2008) believe that the essence of the card-based method is a simultaneous-based mixed data collection method. Cards are created with key concepts, terms or images to encourage interview participant to share more relevant information by offering a visual cue for information (Rowley et al., 2012). Therefore, the card-based method is seen to contribute to the development of rich and highly relevant research insights (Rowley et al., 2012).

This research applies semi-structured interview with a purposive sample of UK ESCOs using the card-based methodology to understand entrepreneurs' opinions about the relationship between EM and TO. It also validates TEMP model's dimensions that have identified and discovered possible emerging themes in the previous online non-participant observation.

An interview question list (see Appendix I) has been developed with the suggestions given by the key participants. Card terms are the dimension terms on the TEMP model and used in semi-structured interviews in a sample of case study firms. The cards guide participants during interviews. Using this system helps to determine, and in some cases exclude, dimensions on the TEMP model. Moreover, the card-based methodology facilitates the data analysis because the interview data is collected regarding the same coding scheme that is developed for online non-participant observation. Using the cards also allows research participants to discuss each dimension freely without research bias

and is recommended for inductive research using the 'en vivo' statements of research participants.

The interview questions included questions about the participant, for example, job roles, ages and education, and firm questions including the year business started and number of employee (full-time and part-time) and whether a firm has an important stakeholder. Other questions include the identification of industry in which the firm operated. Also, whether the firm had specialist marketing resource including a separate marketing/sales team.

Then the cards with dimensions on them (Figure 3.9) show in the randomised way one card a time. Participants were asked the following:

Is this term [dimension i.e. entrepreneurial idea] of relevance to you and your firm?

(if yes) What does this term [entrepreneurial idea] mean to you personally?

What does this term [entrepreneurial idea] mean from your firm perspective?

In summary:

To enhance the internal validity of TEMP model's dimensions, the researcher has developed a rigorous process as follows:

- Identifying the dimension terms: the TEMP model dimensions and emerging themes are identified from the literature review of past EM research and the

dimensions are demonstrated with key participants in three exploratory interviews as well as secondary data from the online non-participant observation.

- Implementing the card-based method in semi-structured interviews: during a semi-structured interview, participants are shown in each dimension card at random. Participants are then able to provide personal viewpoints and explain what the term meant to their firms in their own opinion. Rowley et al. (2013) found that implementation of the card-based method provides the researcher with useful insights when collecting primary data about participants' attitude, experience and behaviour. Furthermore, it also provides useful insights for validating a theoretical model, such as the TEMP model.
- Gathering participants' feedback on the suitability of dimensions: interview participants are requested to reflect on the dimensions they just went through to propose whether dimensions are significantly relevant to their marketing activities or not. Alternatively, participants are also requested to contribute to dimensions on the cards by proposing emerging dimensions regarding their marketing activities and experience.
- Rearrangement of dimensions: participants are also requested to re-order cards to decide which dimensions are most important and which are less important for ESCos' marketing activities at the end of the semi-structured interviews. Each rearranged pattern is recorded by photographing and analysing the importance of each dimension of TEMP model.
- Analysis of the semi-structured interview transcripts in terms of the card dimensions to demonstrate the TEMP model.

3.7 Data Analysis

This research uses data analysis triangulation originating from ethnography and aims to improve the credibility and invalidity of research result to analyse the various data collected from online non-participant observation, document analysis and interview transcripts.

3.7.1 Data Analysis of Secondary Data from Online Non-participant Observations

Saunders et al. (2006) suggest the adoption of software, such as NVivo, in the data analysis process for the secondary data of non-participant observation since data size can be huge and the data types are various. The literature was used to inform and develop the opening nodes. Here, 26 nodes were used to code the data, these are the dimensions of TEMP conceptual model. The researcher developed seven categories for axial coding. These are 'Entrepreneurial Idea and Intention', 'EO', 'MO', 'TO', 'Customer Needs', 'Marketing Performance' and 'External Environment Factors'.

As mentioned in the previous methodology chapter (Chapter 3), code, in qualitative research, means textual word, phrase or short sentence that summarises a single meaning or evocative attribute of a selected semantic data (Bryman 2012). Neuendorf (2016) believes that the success of online non-participant observation relies on the development of the coding process. It might be a comprehensive process because multiple forms of the secondary data are collected, such as policy documents, interview transcripts, photos, website contents, email and social media conversations and video (Bryman 2012). Most qualitative content analyses are inductive, designed to develop

new theory by investigating themes (Wildemuth, 2016). Yin (2009) suggests that qualitative content analyst can adopt a developed coding process as opposed to developing one from scratch. This research hence uses the three-step coding process, including open coding, axial coding and system coding, since it is widely adopted by qualitative researchers (Jeffres et al., 2002; Kohlbacher, 2006; Bryman and Bell, 2011).

During the first stage of the coding process, the researcher managed the collected secondary data to sentence level, labelling each sentence and categorising sentence that has the same labels, in groups. Secondary data was manually analysed from company websites, Facebook, Twitter and mobile applications, and financial data gathered for the previous four years (2012 - 2016). Data were analysed and categorised to identify and corroborate dimensions of the TEMP model and, to identify any emergent themes to aid the development of the TEMP model. Secondly, identified dimensions are combined and then categorised into seven themes (categories), including 'entrepreneur's idea and intention', 'EO', 'MO', 'TO', 'Customer Needs', 'Marketing Performance' and 'External Environment Factors'.

Finally, the potential relationships among dimensions are developed shown as 'dotted line' on the TEMP model, using system coding. The outcome of the second stage of this process demonstrated the existence of 26 dimensions identified in previous EM literature and helped the researcher to ascertain the dimensions and positioning of the theoretical concepts and terms within the TEMP model.

As stated earlier, this research investigates various types of online data such as websites, social media ways and images together to understand how entrepreneurs can facilitate firms' marketing performance. Neuendorf (2002) advises that all collected data should be transformed into a textual format in preparation. This research therefore uses website content, Facebook and Twitter dialogues, Emails and key participant interview transcripts. Table 3.9 shows the digital evidence collected from the web, three mainstream social media channels: Facebook, Twitter and Google+ and the third-party company information provider. Then, 24 sets of data were collected from other channels, including entrepreneurs' LinkedIn profiles, blog articles and news reports.

The number of ESCOs are the same as the website numbers as this research required that all the sampling firms must have websites. However, the information provided on three mainstream social media channels are quite different: a 4-year old ESCOs prefers publishing information and communication via Twitter, while a year 3 ESCOs uses Facebook and Google+. Furthermore, both firms also publish information and use other digital marketing channels.

Table 3.9 A Summary of Secondary Data Sources

Data Sources	Website	Facebook	Twitter	Google +	Company	Others
Age of Firm	Check.com					
1	2	2	0	1	1	2
2	6	1	3	1	6	5
3	12	7	5	8	7	8

4	14	4	12	6	12	9
Total	34	14	20	16	26	24

(Source: Developed by the researcher)

The researcher transcribed the preliminary interviews which were double-checked by a one UK home PhD student in the management department, as English is not the researcher's first language and, recording by another improves content validity (Carson et al., 2001). In preparing the data, information about the entrepreneurs (owner-managers) and their marketing activities was selected as it represents the core focus of the research question. All labelled sentences were classified to develop a hierarchical structure of themes.

Coding category and scheme development should reflect the research philosophy and pattern. The category and scheme for this research are developed based on wider relevant literature, such as limited empirical studies and developed theory on the TO and EM topic. Data from the initial two key participating ESCos was used to understand the energy service industry and enhance the efficiency and accuracy of the coding category and scheme. This is seen as the best approach to increase the consistency of the coding process (Jeffres et al., 2002).

Each theme is broken down into several subthemes regarding previous literature. For example, the theme “market information” has been broken down into market information, firm age and size, marketing knowledge, innovative marketing method,

traditional marketing method and first sales opportunity. Dimension and sub-dimensions are defined by previous theory and the findings of the secondary data analysis. If the level of consistency is relatively low, then coding dimensions or sub-dimensions are re-labelled and the coding category revised.

When presenting the findings of the online non-participant observation, the researcher should find a balance between description and interpretation (Neuendorf, 2016). Moreover, the findings should also support the development of new theory. This step therefore involves the researcher's interpretation of the meanings and trends derived from the data. It also involves reporting unexpected phenomenon within the data.

3.7.2 Analysing Secondary Data of Young Ventures' Documents

Document analysis is described as a particular data analysis method that uncovers the meaning and relationship in the context specifically. It uses the meaningful sentence as its unit of analysis to understand and predict the hidden meanings within a selected context and even build a pattern for support, thus it is seen as the most important and frequent method in social science (Krippendorff, 1989). Neuendorf (2016) claims and extends the definition as a summarising, semi-quantitative based analysis of literary materials to make valid inferences from a particular text.

Development of the method of online non-participant observation offers two opinions that are qualitative content analysis inductively and quantitative in a deductive for researchers (Mouton and Babbie, 2001; Elo and Kyngas, 2008). Lauri and Kyngas (2005) advise the qualitative content analysis devoted to the phenomenon based study

has less or zero previous knowledge. Furthermore, it also excels in the organisation of fragmental knowledge regarding different research questions. Alternatively, the quantitative content analysis is derived from the classical one that provides a transformed and systematic analysis to show statistical results (Bryman 2012). The nature of this PhD research is a study of EM and EM is a relevant young research field that has less prior knowledge and demands more studies based on the set of phenomena. Hence, it adopts the qualitative content analysis to interpret records of the UK energy industry.

Qualitative content analysis is first concerned with a qualitative approach to representing the direct meaning of human communication and imply (Titscher, 2000).

It is defined as:

“An approach to documents that emphasises the role of the investigator in the construction of the meaning of and in texts. There is an emphasis on allowing categories to emerge out of data and on recognising the significance for understanding the meaning of the context in which an item being analysed appeared.”

(Bryman 2012, pp.542)

This form of analysis derives all characteristics from the classical content analysis such as the unit of analysis, coding and category system and also shows the unique characteristics (Kohlbacher, 2006). Levin (1999) has noted four kinds of texts that only qualitative content analysis can represent: text components as the “latent structure of

sense”, the integrated meaning of each case in its specific circumstance and, “things that do not write in the text”.

Therefore, the qualitative content analysis is adopted in many studies in marketing, particularly in EM. For example, Gilmore and Coviello (1999) manifested content analysis is an effective research approach to explore issues at the interface of entrepreneurship-marketing from 352 journal papers analysis. Barringer et al. (2005) have also discussed the relationship between entrepreneurial characteristics and rapid-growth firms by analysing 50 case contents narratively. Different from the most existing marketing theories, EM has been manifested by using a range of qualitative evidence that including surveys, case studies, observations of operations in companies and reports on magazines. Moreover, Rotchanakitumnuai and Speece (2003) have adopted the qualitative content analysis to uncover the limitations of Internet banking successfully through interpreting the interview records.

Elo and Kyngas (2008) have proposed a process for the qualitative content analysis with several steps that include preparation phase, open coding, creating categories and abstraction. In its preparation, content analysis demands a judgement of the unit of analysis in terms of the research question. Bryman (2012) suggests the length of each unit of analysis must be the same and meaningful. Thus, the unit could be a word, sentence, or paragraph in the text. Once the whole selected text is marked, the process next strives to break down and re-organise the units of analysis to understand the semantic meaning of the text through implementing an open coding (Bryman, 2012). Subsequently, the researcher acquired the set of coding labels and, the creating

categories helped to merge similar coding labels and to reduce the number of labels (Elo and Kyngas, 2008). Finally, the researcher needed to structure description of the created categories with research topic together (Elo and Kyngas, 2008). The proposed outcome of qualitative content analysis is a report that presents the systematic, theory-guided new knowledge or manifests the validation of the proposed theoretical framework.

Subsequently, the research attempts to establish an evidence chain by implementing a triangulation analysis of both primary and secondary data (Yin 2009). Triangulation means the use of multiple data collected from different sources while collecting methods within one research to verify data and to establish an evidence chain (Yin, 1994; Saunders et al., 2009; Bryman, 2012). It raises the rationality of research by testing the reliability and validity of the giving data (Yin 1994). Furthermore, it demands a multifaceted understanding of the term “triangulation” that not only means multiple research methodological approaches, but also refers to the multiple identities of participants, sources of data and, theories and knowledge of multiple academic disciplinary are adopted in the research (Yin, 1994; Yin, 2009; Bryman, 2012).

This PhD research determined the semi-structured interview and secondary data collection to be the two research methods that have satisfied the preliminary requirement of using a triangulation analysis. Secondly, evidence collected by this research also comes from multiple sources. In its preparation stage, the preliminary data mainly comes from observations on the commercial websites and social media, such as

Facebook, Twitter, Google Plus and Pinterest. The data collected was recorded as observed notes and then was analysed together with the interview information.

Moreover, the mainly primary data was collected by conducting face-to-face interviews, while the documentary data such as firm's documents, government policies and contents of similar case studies of ESCos published in newspapers and magazines were collected from either participants or the Internet. Thirdly, participants are of the triangulation type because the primary interview evidence was collected from the owner-managers, marketing managers or other employees. Finally, triangulation also means multiple resources of theories in the research. Mentioned in the literature review chapter earlier, the proposed new theory embraces the knowledge of multiple theories, including entrepreneurship, EM as a relevant new cross-disciplinary theory, TO with the Technology adoption and diffusion, and radical NPD. Bazeley and Jackson (2013) suggest that using the computer-based software NVivo ensures the validation and reliability of the findings.

Furthermore, observation, specific non-participant observation, is used for the web content based study to understand how the Internet-based does or involved marketing performs. Brejla and Gilbert (2014) have developed a pattern for the cruise ship tourism, while Parsons (2013) has used 30 million pieces of data on Facebook to understand users' attitudes to the different brand and discussed the establishment of the e-brand on social media. The web-based content analysis requires diverse computer technologies and software to track the users' online activities (Kim and Kuljis, 2010).

Therefore, the researcher carried out the data analysis process of the secondary data in three steps, open coding, axial coding and selective coding, in terms of the coding rounds, as follows:

- Open coding – in this stage, the researcher imported all secondary data from 34 ESCos into NVivo and started to analyse each transcript individually sentence by sentence to identify the keyword or phrase from the answers of each participant. At this stage within NVivo, the researcher searched for keywords and terms to develop codes and establish the semantic meaning from the participants. In exceed of 50 codes were identified and during the later process, some codes were merged or eliminated. Open coding examples include: “**The government Eco flagship scheme, Green Deal** was launched in January 2013.” (Firm 20) and the code identified from this sentence is ‘**Policy**’.
- Axial coding – the researcher read through secondary data across selected firms within NVivo to identify the similar meaning between some codes and classified them into categories. For example, “**Firm 28 is the company I recommend** for Park Homes, there are too many crooks out there at the moment” (Firm 28) and its open coding is ‘**recommendation**’. While it has been included into the category ‘**Customer Satisfaction**’ because recommendation is a consequent behaviour after the customer felt satisfaction.
- Selective coding – the researcher identified the meaning of the categories with codes (from dimensions of the TEMP model) identified from the previous literature. For example, “**AG-energy works with several leading European heat pump manufacturers** including, Danfoss, De Longhi, Dimplex and Nibe, to ensure that the customer has access to the ideal solution for all types of project.” (Firm 02) and the code is ‘**Partnership**’. “Offering Green Deal finance

for all measures, CarbonLow aims to provide one-stop-shop access to the Green Deal and ECO via its **network of assessors and installers.**” (Firm 07) and the code is ‘**Networks**’. The researcher at this stage included them into the ‘MO’ because these aspects are considered to be two types of marketing activities (Jones and Rowley 2011). Also, the researcher developed emerging themes based on new categories which were identified by the researcher as not matching any existing codes/dimensions.

3.7.3 Interview Transcript Analysis

The transcribed interview data was transformed transcripts to start the data analysis by coding. Many previous scholars emphasise that data analysis of interview should start as early as possible because the analysing process may help the researcher to review the interview dialogue and develop further questions for future interviews (Carson et al., 2001; Saunders et al., 2009; Bryman, 2012; Yin, 2013). Expected outcomes of the interview data analysis include narrative summaries and causal links of codes and pattern of the logic that relates to theories in previous literature (Neuhofer et al., 2014). The analysis goals of this PhD project are to seek commonality in the multiple ESCos cases in support or against the research propositions designed in previous chapters (see Chapter.2 Literature Review). It may be that a pattern of technology adoption to help entrepreneurs to locate more marketing opportunities either. Furthermore, findings and outcomes may have multiple presenting methods such as matrices, frequency counts and relationship network (Bryman, 2012).

Carson et al. (2001) suggest qualitative researchers develop codes (themes) iteratively in three rounds: open coding, axial coding and selective coding. Open coding mainly deals with original data from the interview transcriptions summarising and label key meanings of sentences as codes. Apart from the pre-setting code on the label, the researcher allows summarising the key theme in any word or phrase, because codes are revised again later (Saunders et al. 2006). Carson et al. (2001) present open coding as a 'funnel in' metaphor which enables collapsing and eliminating of some codes.

The second round is axial coding demanding that the researcher develops the existing codes again to identify the relationship among them (Carson et al. 2001). Carson et al. (2001) list several possible relationships of codes that include causal relationships, temporal relations, semantic meaning and implication, similarity and difference, syntagmatic relationship, functional and strategic relationships. It requires that the researcher build a unique association between two codes regarding the in-depth analysis (Carson et al. 2001). The in-depth analysis refers to the motivations and intentions of the entrepreneurs, therefore, it requires the researcher to have a deep understanding of the meaning of their narrative.

Selective coding is the third stage and, it is the process to classify the codes in category systematically (Carson et al., 2001). Targeting on the axial codes, the researcher needs to review and summarise the relationships among associations and establish a theoretical pattern that explains all the relationships among codes logically to extend the proposed theory.

Therefore, the researcher carried out data analysis process in three steps in terms of the coding rounds, as follows:

- Open coding – in this stage, the researcher imported all interview transcripts into NVivo and started to analyse each transcript individually sentence by sentence to identify the keyword or phrase from the answers of each participant. At this stage within NVivo, the researcher searched for keywords and terms to develop codes and establish the semantic meaning from the participants. In exceed of 50 codes were identified and during the later process, some codes were merged or eliminated. Open coding examples include: “We do like a **customer** review **satisfaction** survey, or thoughts about the product.” (Firm E) and the code identified from this sentence is ‘customer satisfaction’.
- Axial coding – the researcher read through all the interview transcripts across cases within NVivo to identify the similar meaning between some codes and classified them into categories. For example, “We have carried out thousands of installations via our **nationwide network of contractors** in all the ECO funding sectors and have streamlined our processes over the years to ensure excellent compliance standards and faster payments.” (Firm B) and the open coding is ‘network of contractors’. “It’s a **European-wide network**. I’m using our existing contacts through people I’ve met there.” (Firm E) and the open coding is ‘international network’. The researcher collapsed them into one category ‘Networks’ because they are different types of networks.
- Selective coding – the researcher identified the meaning of the categories with codes in terms of the dimensions (of the TEMP model) identified from previous literature. For example, “If a customer is not paying or getting in trouble -- **difficulty** paying or there's been a change of customer, **we don't always receive**

the right flows or a customer wasn't built correctly, we get involved in that.”

(Firm A) and the code is '**Risk-taking**'. “The Green Deal is a dynamic **initiative** that is **adapting and growing** all the time. The same can be said for us and we are **leading this industry**” (Firm D) and the code is '**Proactiveness**'. The researcher at this stage included them into the category 'EO' because they are two types of entrepreneurial characteristics. Also, the researcher developed emerging themes based on other categories and codes which are not match any existing dimensions.

Saunders et al. (2006) suggest that the transcripts can be coded either manually or through the aid of software such as Atlas and NVivo. It is of growing interests to qualitative researchers a growing interest of qualitative researchers to analyse their transcriptions by using computer-assisted software (Shaw, 1999a; Houghton et al., 2013) and, the PhD research also uses the software NVivo for assistance.

Several advantages have been uncovered when this choice made: First, the software such as NVivo provides a platform that allows the researcher to organise multiple forms of data together (Hutchison et al., 2010). Required by the nature of triangulation, the original data has been collected in several forms with the database that include typed voice records, firm documents, photos and charts and the website and social media. NVivo can assist in labelling codes and establishing relationships among the multimedia forms. Secondly, the software also simplifies the process of theory building and construction to reduce the research time and cost (Bryman 2012).

Once codes have been developed, the researcher enables to use NVivo to link them together and uncover the strength between the codes. Moreover, the report generalisation function would produce the relationship (a pattern) automatically. It also enhances the validity of this case study's logic because machine algorithms generate the theoretical pattern, there is no way to interfering by human action (Neuhofer et al., 2014). It also presents effective solution to avoid the typing-error and generate customised reports regarding the paper requirement in variety (Miles and Huberman, 1994). Finally, the software also gives flexibility and different possibilities to query potential relationships between the themes. The expected outcomes have proved the feasibility of the theoretical framework and to clarify how many and what elements are fed into the model.

3.8 Conclusion

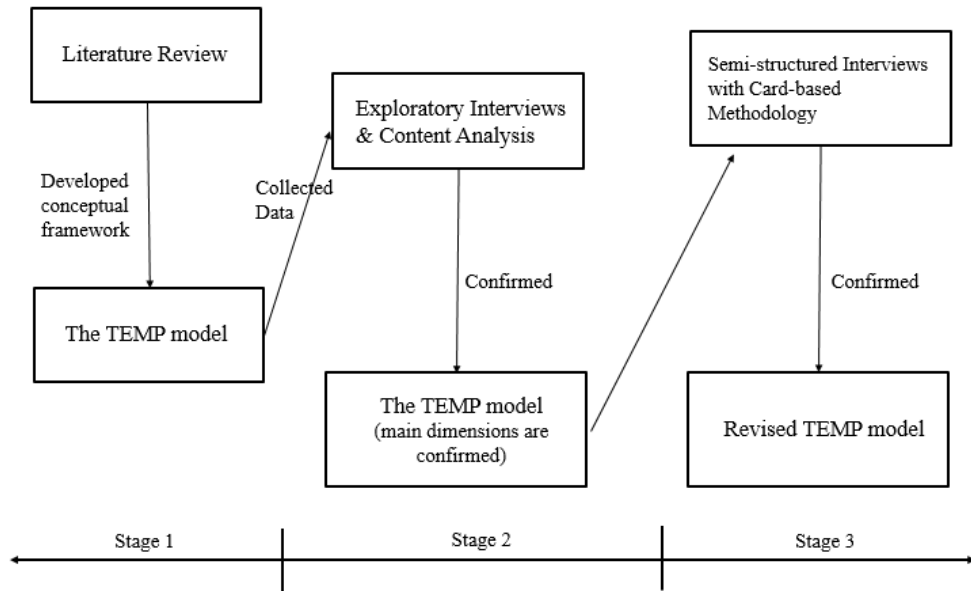
This chapter has provided an overview of methodology into this PhD research project. It was divided into four major sections. The first part discussed the philosophical foundation that this research is mainly subjective and adopts interpretivism with constructivism as its research philosophical stance to investigate the relationship of EM and TO. Second, it includes firm profiles of the participating ESCos. The third section presented the selected research strategy case study via the embrace of two methodological approaches that are the card-based semi-structured interview and document analysis. It also adopts the third approach that is the discourse analysis of similar case studies on publications to build and extend the proposed TEMP framework in general. Finally, the chapter also covered the research ethics concern because there are human participants in this project.

Developing research proposition and PhD project from a philosophical origin is critical because research philosophy is the fundamental base to lead research on the right track. Comparison of various research epistemologies, including interpretivism, positivism and critical realism, help the researcher to choose the interpretivism because a primary purpose of this research project is to understand the relationship of EM and technology in a social environment. Its ontological view suggests that constructivism is the best view to access EM knowledge and its relationship with TO. Furthermore, the researcher determines the qualitative research approach that can demonstrate the dimensions of TEMP model and further understand entrepreneurs' interpretations is more suitable for this research.

The research has also developed a research strategy that uses the UK energy service industry as a single case that includes several ESCos (six to eight) as multiple cases for EM knowledge extension and TEMP model dimensions' affirmation. The case study provides more opportunities to a researcher to collect both qualitative and quantitative data from multiple sources (Eisenhardt and Graebner, 2007; Yin, 2009). With constructivism, a case study emphasises effects of the external environment and culture on the social phenomenon and, allows the researcher to verify or implement the proposed theory into real-life circumstances (Yin 2009). The case study strategy has adopted the interview and secondary data analysis as two major approaches to collecting data. It uses the UK energy service industry as a single case because the ESCos in this industry are varying different. The data collected from multiple sources, such as interview transcriptions and records, online user comments, Google analytical results, firm's financial and operational reports, ensure the reliability of each point of finding.

The research process is designed as follows:

Figure 3.10 Steps of Research Process



(Source: Developed by the researcher)

The flowchart (Figure 3.10) illustrates the research process of this research in steps. Firstly, literature review of previous literature about EM and TO lists several literature evidence that may help young entrepreneurial venture to survival and growth and what impacts on entrepreneurial young venture's marketing performance. The literature evidence is used as dimensions to purpose the conceptual Technological Entrepreneurial Marketing Performance (TEMP) model. Secondly, the reviews of methodological literature help the researcher to determine the research strategy is a qualitative single case study that uses online non-participant observation and semi-structured interviews to collect and analyse data.

Thirdly, this research inductively uses non-participant observation with 34 purposive case firms to collect and analyse various secondary data to verify the prevalence of dimensions and to deductively identify emerging dimensions on the TEMP model. Fourthly, this research uses the semi-structured interviews with card-based interview method to demonstrate dimensions of TEMP model further and identify emerging dimensions. The card terms used are the dimension of the TEMP framework. The cards guide participants during interviews to determine or exclude dimensions on the TEMP model. Moreover, the card-based methodology facilitates the data analysis because the interview data is coded using the TEMP dimension. Using the cards also allows for research participants to discuss each dimension without research bias freely. Finally, the dimensions of TEMP model are demonstrated with both literature evidence and research findings to ensure the validity of the TEMP model development.

Chapter Four: Reported Findings from Online Non-participant Observation and ESCo Entrepreneur Interviews

4.1 Introduction

This chapter discusses the findings from the secondary data of online non-participant observation from 34 selected ESCo young ventures and six semi-structured interviews. The sources of secondary data include 34 selected ESCos' websites and social media, such as Facebook and LinkedIn pages and Twitter conversations. The findings corroborate the TEMP model dimensions from the existing literature and identify potential new emerging dimensions for the TEMP model. The findings have demonstrated rich evidence for all the dimensions of TEMP model and demonstrated the significant roles of TO and EM that introduce advanced technologies from other industries, identify further opportunities and establish partnerships via LinkedIn and local conferences.

The first part of this chapter reports on the findings based on secondary data using the online non-participant observation of the ESCo sample, including company websites, Facebook, LinkedIn pages and Twitter messages. Neuendorf (2016) suggests that online non-participant observation is a structured research method that allows conclusions to be drawn from varying forms of the secondary data to enhance the validation of data analysis for qualitative research. This research undertook the online non-participant observation of secondary data analysis on 34 UK ESCos to understand entrepreneurs' daily marketing activities, identify further dimensions for TEMP model and enhance the validity of research findings. The secondary data comprised of case

studies published on the ESCos' websites, discussions on Facebook, Twitter and other social media accounts and, third-party company information providers, such as CompanyCheck (<https://companycheck.co.uk>) to establish company details and financial reports.

The second part represents the findings from both key participating interviews and semi-structured interviews to develop further knowledge and understanding of the meanings attached to the dimensions of the TEMP model from the key participant perspective. Also, the researcher was also seeking to identify further potential emerging dimensions from the interview dialogues with the interview participants. Furthermore, the findings of semi-structured interviews with card-based method demonstrate evidence about not only the dimensions of TEMP model exist in the Green Deal involved case studies, but also non-Green Deal energy service young ventures. Within-case descriptions and dialogues of the entrepreneurs are analysed to provide rich information of the model' dimensions to elucidate the activities around TO and EM which may correlate to young ventures' marketing performance. These interviews intend to develop a further in-depth understanding of 'how' and 'why' entrepreneurs carry out the EM and TO in relation to the marketing activities identified on the TEMP model and to further populate the Model's dimensions.

This chapter is organised as follows:

- Section 4.2 discusses findings from the secondary data of the online non-participant observations with 34 selected ESCo young ventures.

- Section 4.3 describes the background information about young ventures involved in both key participating interviews and semi-structured interviews.
- Section 4.4 represents the findings of 34 selected ESCo young ventures, which demonstrates TO plays an important role for customer identification and NPD and innovation.
- Section 4.5 represents findings from several key participant interviews.
- Section 4.6 represents the findings from the green deal policy involved case firm to demonstrate TEMP model with its dimensions (chosen from the sample of 34 firms).
- Section 4.7 discusses the findings from non-green deal involved ESCOs to further validate the TEMP model in non-Green Deal ESCOs, in order to understand how the TEMP model performs in other young ESCo (with the same selection criteria) except that they do not use Green Deal. Therefore, application of the TEMP model (section 6.4) takes place in a wider context.
- Section 4.8 a discussion of the findings from each case and, using the application of the ‘TEMP’ model. In Chapter Two, the conceptual model in the literature review indicates the key relevant dimensions in the current literature where new dimensions now are identified and correlated. All the dimensions are examined to demonstrate the omissions in both EM literature and the context of the UK energy service industry. Also, the entrepreneurs’ interpretations give insights into the meanings of the terms on cards and ‘how and why’ they carried out their EM and TO related to their business and marketing activities.
- Section 4.9 summarises the findings of this chapter in the conclusion.

4.2 Rationale for Online Non-Participant Observations

The rationale for using secondary data collected with online non-participant observation is as follow; secondary data analysis was useful for examining the types of marketing activities carried out, using a sample of 34 ESCos. Firstly, the researcher wanted to know how firms carry out marketing in the energy service sector including firms operating with Green Deal and other policy initiatives. Secondly, the data were used to corroborate the dimensions of the TEMP model further and to see whether there were further emerging dimensions for the model. The researcher asserts that TO can encapsulate different types of technologies; therefore, the analysis identified a various use of technologies and classified them into categories such as productive technologies, administrative marketing technologies and innovative marketing technologies.

The online non-participant observation informed the research by enabling analysis of ESCos' marketing activities and also allowed for external environmental factors to be explored such as the influence of the green energy policy on technologies, the impact of environmental uncertainty and, changes in the ESCos' marketing activities. Recent scholars (Bettioli et al., 2012; Yang and Gabrielsson, 2017) warn that dimension 'external environment uncertainty' plays a significant role with a firm's marketing activity and, has a positive impact on opportunity creation, marketing approach selection and firm's survival. Therefore, secondary data analysis from the online non-participant observation allows developing a comprehensive understanding about the role of dimension 'external environment uncertainty'.

4.3 Description of Case Firms Interview Participants

To further demonstrate the dimensions and identify emerging dimensions for the TEMP model, the researcher uses the purposive sampling to select six green technology-oriented young ventures in the UK energy service industry (Table 4.1) for the primary data collection and analysis through various interviews. The selected young ventures take various roles of energy service business, such as GD installers, sustainable product developers and GD financial consultants, in the same case industry, the UK energy service industry, since the entrepreneurs highlight their different entrepreneurial characteristics, such as proactiveness, innovativeness and risk-taking, in their EM activities. The youngest participant venture is one-year of age and the oldest is seven years old. Case firms identified themselves are SMEs, herein, three ventures are micro scale (less than ten people) and the other half are SMEs.

Firm A and C were identified through a university contact list (from an earlier unrelated Green Industry study) and Firm B and D were identified from the Sustainable and Energy Efficiency Exhibition, Birmingham. Case firms (B, C, D, E and F) selected for semi-structured interviews are all young ESCos based in England. The participants in these firms provided broad knowledge and insights for early exploration of the energy service industry and, to help inform the study. Participant A is not an entrepreneur but has vital marketing expertise and Firm C is a small subsidiary of a large British international cooperation. Also, Firm A, C and D have demonstrated the impacts of GD policy on firms' marketing activities and performance, while the developments of case firm E and F take advantages of other green and sustainable policy, such as Horizon 2020, but no relation in GD policy. The researcher confirms not participants (B, C, D,

E and F) as being entrepreneurs based on their interview replies concerning their own entrepreneurial characteristics. Most purposive case firms are all based in England and are financially independent. Further details of each firm's background information are presented as follows in this section.

Table 4.1 Description of Case Firms participated in Interviews

Case Firm	Firm A	Firm B	Firm C	Firm D	Firm E	Firm F
Firm Age	Seven years	Four years	Six years	Five years	One year	Two years
Firm Size	Medium (50 - 250)	Micro (1 - 10)	Small (11 - 50)	Micro (1 - 10)	Micro (1 - 10)	Small (10 - 50)
Business Type	Heating and plumbing; electrical testing and installation; energy efficient solution; ECO and Green Deal	Solar blinds; heating; LED	Solid, external and cavity wall installations; solar power; new boiler installation	Green Deal Training and Service	Eco Shower Tray	Solar PV; Software for Solar PV

Interview Participant is Entrepreneur	No	Yes	Yes	Yes	Yes	Yes
Job role of the participant	Marketing manager A	Entrepreneur B	Marketing/Entrepreneurial manager C	Entrepreneur D	Entrepreneur E	Entrepreneur F
Location	██████	████████	██████	████	████████	████████
Status of the firm	Independent	Independent	Subsidiary	Independent	Independent	Independent
Green Policy involved	Yes	No	Yes	Yes	No	No

4.3.1 Company Background of Case Firm A:

Firm A was founded by an [REDACTED] in 2004. It was a consultancy service providing advice to residents until the participant marketing [REDACTED]. The marketing manager [REDACTED] was previously an [REDACTED]. He advised that the Firm A should focus and take action on the energy efficiency of local buildings. Firm A has been funded by a [REDACTED] company since 2005, then the firm was floated to raise investment for growth and collaboration with a range of local councils. Although Firm A started with only [REDACTED] employees, its business has grown rapidly. Firm A's turnover was £40 million in the second year; double that of the first year.

Marketing manager A credited the success of Firm A's growth to UK energy efficiency policies such as the Green Deal. As a young venture, Firm A has received a range of benefits to reduce the cost of house refurbishment and energy-saving installations by adopting the Green Deal reimbursement scheme and feed-in-tariff (FIT). Moreover, adoption of Green Deal also increased the frequency of collaboration with many local councils because Firm A became a broker who contacted and resolved problems with large energy suppliers, local governments and local property owners. Therefore, Firm A has been able to assess 10,000 residential properties approximately every year since 2012. With the reputation of collaborating with local government, Firm A acquired other business opportunities in the area building Business to Business (B2B) marketing opportunities. With permission from local councils and partners of large energy suppliers, Firm A earned more consumers' trust and increased the firm's reputation by including their brand logos on advertisements and mail shots. The firm provides boilers, pipelines and smart meters and, also provide housing refurbishing services including

heating recycling, roofing and ceiling and water system installations.

Firm A targets customers in both private residential markets and B2B near Essex and its neighbouring counties like Suffolk and Cambridge, a segment based on its geographical competition advantage. Firm A also claims that its company vision is to develop long-term business and grow to become a medium-sized company in the future. Marketing manager A explained that competitive advantage created by Word-of-Mouth using loyal customers is not fully utilised and, there are many untapped opportunities in the local marketplace. To grow the business a step further, Marketing Manager A confirmed they have been adopting a range of marketing approaches that use both traditional marketing approaches and e-marketing activities to appeal to more local customers, particularly young consumers.

Marketing manager A described traditional approaches as meaning mail shots, door-to-door canvassing, and advertisements in local newspapers and radio stations. Having supporting finance from a nationwide VC company, Marketing manager A said they were concerned less by the cost of marketing. Firm A outsourced the traditional marketing activities to the other local marketing firms to raise consumer engagement. Simultaneously, Firm A also adopted e-marketing approaches for marketing. Marketing manager A believed the use of the website and social media such as Facebook and Twitter allows consumers to check the creditability of a firm, accessing important information anywhere anytime, and an excellent platform for advertisement. E-marketing methods are also used to facilitate the quality of after-sales customer services by posting comments and suggestions and organising surveys on their Facebook page. Furthermore, e-marketing allows Firm A to communicate with its new customers

effectively and reduces approximately 80 per cent costs for the firm compared to more traditional methods.

Marketing manager A believes that truly successful marketing demands partnership and well-established networks, therefore, Firm A established a frequent collaboration relationship with other ESCos in Essex and Cambridge and local councils. E-marketing approaches such as LinkedIn were used to develop further business relationships and communicate to partners.

4.3.2 Company Background of Case Firm B:

Firm B is a ██████-based young venture that was founded by an entrepreneur, Owner B, and another co-founder ██████ in 2014. Entrepreneur B also founded another sustainability firm in winter 2012, although this is an independent business that has no relationship with Firm B. Entrepreneur B is a senior engineer who worked for the UK energy industry for over twenty years and then he became a serial entrepreneur to continue funding at least two firms and one plant in the industry sector of sustainability and energy efficiency. Like many young ventures, Firm B twice failed to acquire a financial investment from CVs. Despite Entrepreneur B being reluctant to provide the firm turnover, he did show satisfaction about the marketing performance of Firm B.

Firm B provides innovative products that include infrared heating panels by combining German intelligence with an existing UK technology and, blinds with smart meters by adopting the US National Aeronautics and Space Administration (NASA) technology and also, imports LED lighting technology from a Chinese company. Firm B targets public sector customers such as schools, universities and hospitals (B2B marketing) around Durham. Entrepreneur B also established a distributed direct selling partnership

with two agencies located in London and Manchester.

The firm creates a market segment based on the most valuable customers from its collaborating ESCos. However, Entrepreneur B also believes that collaborating relationships with partner ESCos is a critical factor in the success of this firm's growth. Thus, Entrepreneurs B frequently revisits loyal customers and requests loyal customers to recommend new customers by using the Word-of-Mouth. To take the Firm B step further, Entrepreneur B confirmed that they have been adopting a range of marketing approaches that are both traditional marketing approaches and e-marketing to attract attention from local customers, particularly young consumers.

Entrepreneur B acknowledged that Firm B had not got a clear marketing strategy or a finance plan to conduct daily marketing activity. Since Firm B is a young firm that has been founded less than six months, Entrepreneur B decided to use more traditional approaches, including posting mailshots, advertising in newspapers and magazines and friend referral, to seek 70 per cent new opportunities from energy efficiency customers and using the website to identify the other 30 per cent. Simultaneously, Entrepreneur B also attempted to adopt e-marketing approaches for marketing. He created a Facebook and Twitter account and a website to draw the attention of the young generation. However, Entrepreneur B required technical support to learn the best way of using website and social media. E-marketing approaches have also enabled the Firm B to communicate with its new customers effectively through posting successful case studies with the use of content marketing.

4.3.3 Company Background of Case Firm C

Firm C is an energy efficiency firm based in [REDACTED] and is a subsidiary of a large

international corporation: Corporation C. Corporation C was set up by the father of the founder of Firm C to [REDACTED] [REDACTED]. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

As a subsidiary of Corporation C, Firm C has lots of support such as financial support, skilled employees and customer contacts of Corporation C. For example, Firm C has been authorised to provide ECO that has not otherwise permitted to be provided by suitable ESCos. Firm C employs an experienced marketing team to identify new customers and markets. Firm C became the forefront of the UK energy efficiency industry to provide both energy efficient products and services at the beginning of 2015. Products include solid, external and cavity wall installations, new boiler and heating system installations, solar panel development and also services. These include property assessment and testing, Green Deal financial solutions and ECO. The participant marketing manager C joined the firm in 2013. The marketing manager C used to be a marketing manager who worked for British Gas and E.On for seven years and, she is also a friend of Entrepreneur C that allows her to access more firm information than other employees.

Firm C has invested plenties of money, energy and resource on new product development and innovation regarding the Green Deal requirements and, also Marketing Manager C employs a professional marketing team to seek new customers in the B2B part of the industry and develop partnerships with large construction

companies. Firm C also aims to improve house energy efficiency for over 500,000 private properties based in England and Wales annually. Therefore, Marketing Manager C in January 2013 developed the Snug Network that provides a series of high-quality self-branded products and services and a national-wide network with collaborative independent installers.

The network is an Internet-based information exchange and communication platform that encourages individual installers to establish a partnership with Firm C and other installers to get more business opportunities from large property refurbishing projects. Firm C is chosen as a Green Deal provider to guide those individual installers joined by the Snug network. Marketing Manager C states that the Snug Network development helps Firm C to build a more significant business reputation by offering better access to customer credit and customised products.

Marketing manager C credited the success of Firm C to the UK's green energy policy, such as Green Deal and ECO. Firm C has received a range of benefits to reduce the cost of house refurbishment and energy-saving gear installations by adopting the Green Deal reimbursement scheme. Use of Green Deal also allows for an increase of the frequency of collaboration with many local councils because Firm C has become a financial scheme provider who contacts and resolves problems between large energy suppliers, local governments and local property owners. Therefore, Firm C has been able to assess 500,000 residential properties since 2012. It provides products that include boilers, pipelines and smart meters, while also providing housing refurbishing services that including heating recycling, roofing and ceiling insulation and, water system installation.

Marketing manager C confirmed they had adopted a range of traditional marketing methods and digital marketing to appeal to the attention of local customers, particularly young consumers. Administrative marketing methods include conference and exhibition attendance, door-to-door canvassing, and outdoor advertising. Additionally, Firm C employs a social media team outside Firm C to update website content and operate Facebook advertisements and Twitter communications weekly. Marketing manager C believes that use of digital marketing and social media such as Facebook and Twitter give consumers an opportunity to check the creditability of the firm and, access to important information.

4.3.4 Company Background of Case Firm D

Based in [REDACTED], Firm D is a small energy service firm that focuses on supplying and installing energy saving products Green Deal and through intermediary installers in the UK. They also implement and control the Green Deal contracts, the remaining business left providing an income stream following the abrupt end of Green Deal.

Firm A has two entrepreneurs as owner-managers and two employees, all of them work full-time. The entrepreneurs' ages range between 36 to 45 years and they both hold [REDACTED]. Entrepreneur D has a Bachelor's degree in business and marketing. There is another important shareholder who has detailed knowledge of green policy and his experience informs the management of case Firm D. The third shareholder works part-time. One primary motivation for setting up Firm A was because one of the entrepreneurs saw an opportunity to help other house owners to

improve the energy consumption through sharing the skill and experience of his property portfolio refurbishment. Therefore, Firm D centres on providing Green Deal financial funds to individual house owners while also delivering the training and certificates to Green Deal assessors and installers.

Entrepreneur D acknowledges that Firm D does not develop energy efficient products and the products product installations are assessed and provided by those they collaborate with, the Green Deal assessors and installers. Although the Firm D's website lists a wide range of energy efficient products still, that include: the internal and external wall installations, loft installations, A-rated boilers, heating control devices, solar panel and thermal panels, and energy efficient windows and doors.

Entrepreneur D recalled during an interview that Firm D used to employ a professional marketing team with twelve full-time employees to develop relationships with local authorities and house owners as new customers. The other important Green Deal service provided by Firm D is delivering the Green Deal training and skills to local Green Deal providers, including assessors, installers and finance consultants. It allows Firm D to develop various relationships with hundreds of local GDPs as business partners. As a new venture heavily reliant on Green Deal policy, Firm D had to deal with a wide range of changes in the marketplace, especially withdrawal of Green Deal policy and changes in customer requirements and that of partnerships with other Green Deal providers since Green Deal policy was announced a failure by the UK government in July 2015. Entrepreneur D decided to make the marketing team redundant to survive.

Interestingly, the entrepreneurs of Firm D decided to stay in the energy service industry and are waiting for the Green Deal to be brought back by the government again. In their present situation, Firm D provides other energy efficiency and carbon reduction financial schemes such as CPA to customers. Entrepreneur D describes their marketing activities as both administrative marketing and digital marketing methods. Hence, Firm D will use further social media methods, such as Facebook and LinkedIn, in future marketing events as they are moving to more direct marketing targeting B2C than B2B (supplier relationships already described). Findings from Entrepreneur D's interview are significantly valuable because it is a green policy involved firm that centres on service provision. Therefore, it helps the researcher to develop further understanding of the energy service industry.

4.3.5 Company Background of Case Firm E

This case firm is a micro-energy efficient shower tray company based in [REDACTED]. The firm has three co-founders (three part-time) and one full-time. [REDACTED]. The firm has been running for [REDACTED] and does not have a fixed office location. In the first instance, the firm was founded at the business incubator of the [REDACTED].

This entrepreneur has developed a revolutionary shower tray that can store heat energy and reduce energy costs. Its slim size allows the product to be installed in a small

shower room. At the time of this interview, the product is still under development and it will be manufactured for mass production by the end of the year, 2017.

The firm has target customers in the market by accessing the customer contact lists of its large partnering companies (B2B). Internal and external communication with the partners and consumers are achieved by several approaches, including personal visits, emails, Skype and mobile phone calls. Apart from seeking new customers, Entrepreneur E is seeking positive opportunities for cooperation with large shower tray manufacturers to licence the product patent. Regarding planning for the future of the Firm E, Entrepreneur E aims to develop a new generation of the eco shower tray that is inexpensive and saves extra heat energy compared to the current product.

The entrepreneur, Entrepreneur E, is a former electrical and technology expert for a large manufacturing energy testing firm. He has several contacts in various industries. Born in a [REDACTED], Entrepreneur E has learned lots of business wisdom from his parents and his uncle, the co-founder of Firm E. Entrepreneur E has several work and entrepreneurial experience in the energy service field since graduation from college. Entrepreneur E has spent over £10,000, the sum of the Entrepreneur's income during past six years, on the development of the eco-tray because saving energy and development of an energy-efficiency shower tray has been a dream of his since he worked for a world-class energy manufacturer eight years ago. Firm E works very closely with several universities in the UK to access the latest business and marketing knowledge to generate sales leads.

Firm E continues to invest in innovative energy-saving technologies and development of patents for the mini-size shower tray. The firm won the climate innovation competition organised by Climate-KIC UK with a prototype of the eco-tray and had planned to sell these technologies with the products in the domestic market in the UK to both private and public sectors. Entrepreneur E is planning to implement his idea by licensing his partner companies.

4.3.6 Company Background of Case Firm F

Case Firm F is a small-sized solar panel solution-providing firm based in [REDACTED]. The firm was founded in January [REDACTED]. The headquarters of this firm is based in [REDACTED] and it has a branch office based in a northern Canadian city. The firm is run by five co-founders [REDACTED]. The five co-founders work full-time and the firm employs several part-time employees [REDACTED]. The interview is taking place with one of them, Entrepreneur F.

Entrepreneur F is an [REDACTED]. Therefore, Entrepreneur F has lots of experience in global green energy policy, founding new business and developing public relationships. Working at Firm F, Entrepreneur F is [REDACTED].

██████████ who is carrying out all the activities of the Firm F to sell the product, communicate with suppliers and seek investments.

The firm's business is quite different from the usual solar panel solution providers that focus on innovative solar panel technology and development. Hence, Firm F does not develop the solar panels but provides the customised solar panel package that includes installing 'solar generators into the existing electrical system' and the development of customised hybrid electrical control systems for solar and diesel energies. The firm aims to target the African market since there is plenty of solar energy wasted. To achieve this goal, Firm F provides the modular design of solar generators to reduce the weight and cost. The firm has completed several projects with African companies and local authorities, despite it being founded less than two years ago.

The firm has identified new customers by accessing the customer contact lists of its collaborating companies. Skype, mobile call and Facebook Messenger are frequently used for internal communication among co-founders since they are based globally. Furthermore, Entrepreneur F uses email and the mobile phone to manage their business and seek new opportunities. Apart from seeking new customers, Entrepreneur F is proactively updating his marketing knowledge about the market and competitors through his networks, since there is highly intensive competition in this area. Investments in innovative solar and mobilisation technology are beneficial to Firm F by improving solar-efficiency and cost-efficiency and increasing product competencies from rivals.

Mobilisation means Firm F has developed smaller size solar products than the usual products in the market. The firm works very closely with the banking industry to gain financial investment from either large banks or individual stakeholders. During the interview, the participant, Entrepreneur F, asked six times for pauses to contact a potential banker for investment.

4.4 Findings and Discussion from Secondary Data Analysis

This session presents a thematic analysis of the secondary data. Relevant excerpts from the data are provided to support the findings. A cross-case analysis of the whole sample, discussing the impact of these aspects on the marketing performance of the UK ESCos start-ups follows this discussion.

4.4.1 Entrepreneur's idea and intention

4.4.1.1 Entrepreneurial idea

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

[REDACTED]

[REDACTED]” (Firm 3 Website –About Us)

4.4.1.2 *Entrepreneurs' intention*

“
.
.” (Firm 11 Website -About)

“
.
.” (Firm 20 Website
–About Us)

The findings show that most of the selected UK ESCos (29 firms) show their entrepreneurs' ideas and intentions on company websites or LinkedIn pages. The entrepreneurs tend to provide cost-effective products and establish long-term relationships with consumers. However, the entrepreneurs' ideas and intentions are quite similar, which may result in the entrepreneurs producing similar products, thereby causing high regional competition between UK ESCos.

For the UK ESCos and entrepreneurs, entrepreneurs' ideas (38.2%) and intentions (58.9%) were identified. Several ESCos (seven firms) also claim to have been the first Green Deal providers or claim to offer unique products and services to their local markets. Trevelyan (2008) maintain that the entrepreneur's intention is a vital component for new venture creation and is also the source of pro-activeness. Kasouf et al. (2015) have proved a positive relationship between the entrepreneurs' ideas, intentions and innovativeness. However, even though several entrepreneurs stated their

ideas and intentions on their websites, the findings show that the claims are very similar: For instance, claims to deliver renewable technology (products) or financial schemes (benefits of green policies) to reduce the cost of energy for residential properties. This similarity also occurs about 'ideas and intentions' and could be a double-edged sword that can help the ESCo focus on growth in collaboration with other ESCos, or it may create obstacles to innovativeness, as well as confuse consumers. The card-based interviews with other companies may clarify this view.

4.4.2 EO

Entrepreneurs tend to share their entrepreneurial motivations with their potential customers on their websites and social media channels. One possible reason is that this can increase understanding of the firm's history and build trust (Pettersen and Tobiassen, 2012) and enable direct access to more customers.

The online non-participant observation also examines the impact of experience from two perspectives: The first dimension is 'entrepreneurial experience' that is less found on their digital marketing channels. Although Morrish et al. (2010) find that the entrepreneurs with previous entrepreneurial experience tend to be more successful at creating other firms, this is not supported by the findings. Instead, this research finds that ESCos founded by the entrepreneurs with no previous entrepreneurial experience not only survive but are also strong performers. One possible reason is that the founder-owners employ managers or staff with entrepreneurial experience or employ the use of innovative technologies. The other dimension is work experience, which refers to previous working experience in the energy service industry. The majority of the

founder-owners, 30 of the 34 firms, had rich work experience in the energy supply, energy service, sustainable and green energies and energy consumption consultancy fields. Therefore, the subtheme, work experience, is confirmed as a dimension.

4.4.2.1 Motivation

Information Technology is used not only for displaying product information and energy policy knowledge, but also for self-promotion. Thus, it allows the entrepreneurs to explain their ambitions and original expectations of marketing performance.

“As a pioneer and industry leader, we were chosen as an accredited Green Deal Provider for the Government-backed initiative to help improve the UK’s energy efficiency.” (Firm 11 Website – About Us)

However, the owner-managers seem to have clear but similar ambition on sales. 100% of 34 ESCos uses the word “leading”, “leader” or “pioneer” to describe themselves, while 30 of 34 (88.3%) maintain that they are selling “the best energy efficiency solution”. Two start-ups (5.89%) mention that *“They are not selling complex energy technology, we send an expert to help you ...”*. Four ESCos (11.8%) use the word “friendly” and “referral” to express their long-term marketing goals and their approachability.

4.4.2.2 Entrepreneurial Experience

Whether or not an owner-manager is an entrepreneur is based on two criteria: (i) did the owner-manager previously own or participate in the formation of another firm and,

(ii) did the previous work experience involve characteristics such as taking diverse job roles. This may explain the low ratio of the entrepreneurial experience content: the owner-manager who is an entrepreneur but who does not see himself as an entrepreneur and, the entrepreneurs who may think their identities are irrelevant with the firm or marketing activities and do not make any mention on their websites or LinkedIn descriptions.

There are three owner-managers (9.83%) who describe themselves as entrepreneurs.

“At [Firm 33] we believe that for people to reduce their energy consumption the products they use to achieve this must not impede their lifestyle but enhance their experience.... I remain as a director of Firm 00 Ltd however our new focus at CH4 is in delivering cutting-edge BioFilter solutions to the AD and Composting industries and general AD Consultancy, specialising in planning... in the UK mainland for lack of affordable funding, however we are still very active in Northern Ireland” (Key Participant Interview Transcript [Firm 33])

The content evidence provided above shows an owner-manager’s entrepreneurial experience. He founded Firm XX to produce and deliver renewable energy products to customers initially and then set up his second firm, [Firm 33], to sell energy efficiency products. The other evidence is found from the manager's profile of the Firm 13 as follows:

“XXX has worked within the management side of the building industry

” (Firm

13 Website – Who we are)

Furthermore, seven owner-managers hold positions in other companies. However, they prefer separating their identity as ESCOs owner-managers from their other job positions. This means that the owner-managers who own multiple identities do not want to link their new energy efficiency businesses to their previous businesses. One possible reason may be the fact that the businesses belong to different industries and diversity between industries may build barriers to integrating their businesses.

*“So the reason is because they can’t connect to each other is because they...
the business visions of these two organisations are different or ...” (Firm 17
Website)*

4.4.2.3 Work Experience

Here, 29 owner-managers (85.3%) had diverse work experience before they founded their ESCOs whereas four owner-managers (11.83%) have no work experience and one owner-manager’s work history is not clear.

“The highly experienced team of energy efficiency professionals have extensive knowledge and expertise in the management of cost and energy saving programmes, as well as the successful delivery of national carbon-based schemes.” (Firm 2’s Website)

“We consider ourselves to be experts in this field by virtue of our wealth of experience and industry knowledge.” (Firm 3 Website)

Data collected about whether or not the entrepreneurs have previous entrepreneurial and work experience helps the researcher to understand the difference attitudes to information technology adoption between entrepreneurs and non-entrepreneurial owner-managers.

4.4.2.4 Risk-taking

Risk-taking is identified as an essential dimension that relates to an uncertainty environment and customer identification in what is described as a volatile market. Uncertainty in the market is caused by some unprofessional ESCOs that reduce customer confidences into engaging with other ESCOs. Furthermore, risk-taking is highly relevant to entrepreneurial behaviour that drives the entrepreneurs to opportunities and applies different innovative marketing methods to maintain customers.

“In an industry where unprofessionalism is rife and clawbacks are high, we guarantee that our compliance teams are strict but ultimately will get you paid on the carbon that you submit through us.” (Firm 3 – LinkedIn)

“We've been told our way of working is refreshing in such a volatile market. In fact, we haven't lost a client yet.” (Firm 33 – Website)

4.4.2.5 Proactiveness

Proactiveness presents itself in the findings as the entrepreneur's role in taking varied marketing activities to take first-mover advantage (Dess and Lumpkin, 2005) or, as much as possible, distinguishing the firm from competitors to seek new customers. Being a first-mover allows entrepreneurs to move away from close competitors, gain more innovative experience and new opportunities in new markets and greater differentiation than their competitors.

“Firm 9 works at the forefront of the energy efficiency and acoustics industry.”

(Firm 9 – Website)

“As a pioneer and industry leader, we were chosen as an accredited Green Deal Provider for the Government-backed initiative to help improve the UK's energy efficiency.” (Firm 10 – Website)

Three key findings are identified concerning EO. First, the findings suggest most owner-managers have clear but similar ambitions on sales, while few owner-managers realise that sharing unique sales ambitions with their customers may persuade more users to engage with them. Furthermore, EO findings show all owner-managers mention their previous work experience on websites or their personal LinkedIn profiles, while only a few of them mention that they have participated in the founding of other firms. However, two owner-managers with entrepreneurial experience have a very clear vision of their marketing activities. Finally, the findings show that more than 84% of ESCos start-ups are micro and small-sized businesses, this means that ESCos may not hire more employees when their businesses grow. They may use advanced technologies to save costs and replace labour, while specific marketing activities are often outsourced.

Apart from entrepreneurial characteristics, the findings also highlight the importance of entrepreneurial actions, including entrepreneurial resources (including recruiting personnel with relevant expertise), network development and new market/customer creation. To survive and grow the business, the ESCos show continued investment in product research and development, operations and marketing. Therefore, over two-thirds of the sample ESCos demonstrate that they had or at least attempted to seek investments from private VC companies or governmental authorities.

Eight ESCos recruit experienced workers and energy or marketing experts on their websites, Facebooks or Google +. Two ESCos (Firm 10 and 13) have developed their Internet-based networks, providing information on hundreds of ESCos and their products. They highlight the number of business partners and local counties with whom they have cooperated on the homepages of their website, Facebook and LinkedIn. Furthermore, many entrepreneurs interact with their customers via social media, especially to provide after-sales service and collect customer opinions.

4.4.3 TO

4.4.3.1 Product and Service

The sample of 34 ESCos firms provides various numbers of products and services, with most ESCos (23 start-ups) providing either products and services to customers. Here, eight of them focus upon providing energy efficiency solutions and have no intention

to provide their products, while, another three only show their product categories on their websites.

The most common products are solar PV, heat pumps, biomass boilers, CHP (combined heat and power) systems and LED lighting, showing up 27 times within different start-ups' product categories. Services such as home efficiency assessment, solid and canvas wall installation and Green Deal financial projects are the top three the most welcome services provided by 21 start-ups (61.8%).

“Our carbon reduction installations include a range of solar PV, solar thermal, heat pumps, biomass boilers, combined heat and power, rainwater harvesting systems, LED lighting, high-efficiency lighting and wind turbines, and offer a comprehensive advice, design and installation service for both domestic and commercial customers.” (Firm 11 Website -Homepage)

Three start-ups introduce integrated energy solutions that combine products with services and another promises to simplify and customise the purchasing process by sending a one-to-one expert.

“Unlike other businesses we don't offer carbon reduction and renewable solutions as a separate part of our business...”

“We won't bombard you with technical jargon - we will provide you with expert, friendly advice and guidance on how to save money and get the best out of your systems and premises.”

One example of the new product with an innovative technique (Appendix D) shows how to lock energy inside a house by extending the thickness of the walls. Firm 8 claims that their unique six-layer warmth-keeping mesh and render different from any other products in the market.

The services provided by the ESCos include GDA (Green Deal Assessment), ECO (Energy Company Obligation) score calculation, EPC (Energy Performance Certificates) provider guarantees, the Green Deal Financial Scheme and Green Deal refunds.

“Alternatively, if you wish to just lodge EPC’s through our GDAO to receive lower lodgement cost we are happy to help. Each lodged EPC will be charged at £5.75.” (Firm 4 Website -GDAO)

4.4.3.2 Technological Superiority

Although several ESCos claim that they can provide the best products, there is no evidence are identified about what the unique technologies are used. One possible reason may be the need to protect technological superiority as a source of business competitiveness. The researcher will therefore collect further relevant data from the card-based interviews in the next phase.

4.4.3.3 Innovativeness and New Product Development

The analysis considered administrative marketing approaches and innovative digital marketing methods. With regard to technological superiority and innovativeness, all 34 of the ESCos sampled had several products and services that involved multiple productive technologies, such as infrared ray, combined heating and power (CHP) and photovoltaic. Five ESCos used keywords like “*innovative*”, “*pioneer*” or “*cutting-edge*” to describe their products. This confirms that the UK ESCos focus on product development with productive technologies.

However, this research found that the products and services listed on the ESCos' websites suggest their products might be similar. Therefore, innovativeness and technological superiority for the UK ESCos might be tailored design or tailored innovation (Hansen et al., 2007). Customised design or innovativeness means that the firm creates a new product by combining different products, technologies or ideas to produce an “upgraded” product.

4.4.3.4 Digital Marketing

The above discussion does not mean that the technologies adopted by ESCos have only two functions of supporting production and facilitating communication, it shows evidence of technology also being used in marketing too. Two firms use their websites as e-stores, displaying not the information about their products and their firm but also prices and an online payment system. Digital marketing makes the website more functional, allowing for one-site shopping and secure payment provided by PayPal

thereby increasing customer confidence. Other ESCos use mobile marketing methods, such as Quick Respond (QR) codes and iPad apps, in their advertisements and promotion activities, which is further evidence of marketing functions being undertaken by digital marketing technologies.

4.4.4 MO

4.4.4.1 Marketing Knowledge

ESCos provide the latest news about changes in the energy industry, the Green Deal scheme and the firms themselves. The online news refers to free information provided for web users. 22 of the 34 ESCos provide online news. However, there is no evidence that the ESCos use the news for marketing purposes to continually inform changes on market and customer needs.

“Did you know that around 35% all the heat lost in an un-insulated home is through the walls? Insulating cavity walls reduces heat loss and can save you around £180 a year on your fuel bills.” (Firm 4 -Website)*

*“Oil and LPG users in our main areas of [REDACTED] [REDACTED] could save up to **60% on heating bills** using ground source or air source heat pumps” (Firm 2 – Website)*

Four ESCos websites or blogs provide their previous energy efficiency projects as online case studies. They use case stories to emphasise the superiority of ESCos by providing rich information such as time, place, customer’s identity, product and service and the consumer’s problem.

4.4.4.2 Networking

The collaborative sub-dimension examines the relationship between ESCOs start-ups and large Energy companies or local authorities. ESCOs start-ups may find their first business opportunities by working with local authorities. Others may acquire opportunities by collaborating with a large energy supplying company:

“Our supply chain for insulation materials is supported by one of the world's leading and largest innovative material manufacturers of the highest quality and reputation.” (Firm 4 Website –About Us)

“Co-founder is one of a small handful of people with deep expert knowledge of these complex mechanisms and has worked closely alongside industry colleagues and Government officials to help shape the country's domestic carbon reduction policy.” (Firm 6 -Website)

Cooperating with local institutions of higher education, such as universities offers a source of innovation. ESCOs may become aware of or obtain innovative technologies from universities. The ESCOs may also uncover or even create marketing opportunities by cooperating with academic marketing research groups within universities.

“The Green Growth Platform (GGP) is a £2.95m programme set up by Director, XXX, with the objective of connecting and linking the knowledge assets of the University of [REDACTED] with over 1,000 environmental sector companies.”” Firm 08 is proud to work with the GGP and have greatly benefited and is still benefiting from the ongoing collaboration.” (Firm 8 Website - University)

However, the incidence of cooperation between ESCos and local universities is very low (5.89%).

4.4.4.3 Word-of-Mouth (WoM) marketing

There are no details about how entrepreneurs use WoM marketing online. The researcher will collect the relevant data from the interviews in the next research phase.

Findings related to TO also demonstrates visible, diverse energy efficiency products and services, as the ESCos attempt to acquire more marketing opportunities. Some high-performance ESCos also provide an integrated energy efficiency solution to facilitate customer satisfaction as part of marketing performance. Furthermore, findings confirm that networks and partnership are important methods to improve marketing performance, providing access to business opportunities or opportunities to collaborate with other ESCos. However, a limited number of ESCos collaborate with local universities to discover new business opportunities or acquire research in innovative productive technologies. Additionally, there is little evidence of interaction with customers to gather market information.

4.4.4.4 Administrative and Digital Marketing

Table 4.2 Marketing Tool Selection

Marketing Methods	Number of the ESCos
Administrative Marketing	34
WoM Marketing	5
Web (e-marketing)	34
Social Media Marketing	27
Mobile Marketing	3
E-CRM Marketing	2

Shown in Table 4.2, administrative marketing tools have been used by all 34 ESCos. The traditional marketing tools include direct marketing, telephone marketing, conference and exhibition, emailing, outdoor and door-to-door canvassing campaigns and radio and TV advertisements. Five ESCos have confirmed that they found business opportunities by WoM. In addition, 34 ESCos use their websites to display information about products as well as about the firms and, 27 of them use one form of social media such as Twitter and Facebook. Furthermore, three ESCos had third-party software companies develop mobile applications for tablet users whilst two entrepreneurs attempt to facilitate marketing by adopting E-CRM.

Table 4.3 Unique marketing methods adopted by UK ESCOs

Unique marketing methods	Digital ecosystem	Networks	E-Store	Mobile Applications
No. of Firm	6	1	1	3

This research also proposes to examine whether or not the selected ESCOs adopt innovative e-marketing methods such as an integrated digital marketing ecosystem, web-based networks with different ESCOs, E-store and mobile applications on digital devices. Table 4.3 shows the 6 ESCOs that claim to provide integrated energy efficiency solutions that combine energy efficiency products and services. Other ESCOs build their websites as an online store (E-store). This changes the stereotype of a website that is simply used for products and information display. The e-store (see Appendix E) enables the function of ‘purchase’ and ‘payment’ for the web users to simplify the purchasing process.

Furthermore, another three ESCOs developed iPad applications for surveys, customer opinion collection and communication.

“All GDAs lodging GDAR’s for Green Deal Plans through us will need to be using our iPad software.” (Firm 4 Website - GDAO)

The TO findings show that the innovativeness dimension can include four kinds of innovative marketing methods that have been adopted by ESCos. ESCos that adopt innovative marketing methods show financial growth. Furthermore, E-store development, as an example of direct marketing, has proven that it is not necessary to increase the marketing budget to adopt innovative marketing methods. These firms could adopt a relevant mature digital marketing technology, such as a website, to provide “one-stop” purchasing to consumers to control budgets and reduce technological uncertainty.

Most entrepreneurs use fundamental communication technologies, like email, telephone and on-site question submission. Only five of the fourteen 4-year old ESCos and one 3-year old firm had advanced websites and online customer service systems. Evidence found on Twitter suggests that ESCos find more potential customers and increase customer satisfaction by using social media. The findings show that most social media channels are used to display product and service advertisements as well as company information. Moreover, both websites and social media channels are used to manage customer enquiries (20.6%) and after-sale services (11.8%).

However, few ESCos (26.5%) have considered using their Twitter, Facebook or even LinkedIn channels to gain an understanding of customers' needs or, attempt to provide products on Facebook and Twitter. The findings also show that most social media users become inactive after contacting ESCos on social media. These research outcomes confirm research by previous scholars in digital marketing studies (Harrigan and Hulbert, 2011; Alford and Page, 2015; Anwar et al., 2016).

4.4.5 Customer Needs

Understanding customer needs help entrepreneurs identify new opportunities online. Its function is similar to after-sales service. Six inactive examples on ESCos' Tweeters are found, with examples included below;

*“Customer XXX Hi there, I was wondering about getting my house
windows replaced*

████████████████████ 26 25 Jul 2013”

...

“@Customer XXX Thank you, Can you help my friend as well.”

(Source from Firm 26 Twitter)

In addition to customer needs, ‘customer satisfaction’ could also be used to measure the difference between the customer’s expectation before and after purchasing. Many of the ESCos post customers’ testimonials on their websites and customers also leave comments and complaints on social media platforms. This research has also reviewed customers’ testimonials posted on websites as well as analysing customer dialogue on social media.

Seven ESCos post their customers’ testimonials on their websites, here are two examples of such testimonials below:

"The boys were just wonderful. I have never known guys to work as hard as them. They barely stop to drink the tea I made them! Not only are they hardworking but they do the most professional work I have seen out of any

other company doing this work on my site. I am so happy with my lovely new Park Home"

"Cannot thank Firm 13 enough" (Firm 13 website - testimonial)

Customers also leave comments on social media, for example this user's comment on Firm 5's Facebook page:

"Already got one fitted saved a minor fortune :)" (Firm 5 Facebook – User comment)

Findings of customer needs suggest that customer needs and customer satisfaction are two important subthemes published via several marketing channels, such as the company's website, Facebook and Twitter. The entrepreneurs also use multiple ways to identify customer needs and satisfaction. For example, some of the entrepreneurs hold ad hoc discussions about their products and services with customers on social media. They also post consumers' testimonials on their website to increase customer numbers. Two of the sample ESCos use Asynchronous JavaScript and XML (AJAX) as a real-time pushing website technology to remind website browsers of the numbers of positive customer reviews they have received. Customer needs therefore create or bring more opportunities, encouraging referrals by existing customers.

4.4.6 Marketing Performance

ESCos' marketing performance was considered from both financial and non-financial positions. The 34 selected ESCos were divided into three categories in terms of the growing differences of the financial performance curves. Few ESCos show growing

trends, while several ESCos have only started performing well after getting funding or investment. The researcher assumes that the ESCos may use other non-financial factors to measure their marketing performance. However, there is limited evidence to support this assumption. It is therefore proposed that the collection of more primary data during interviews with the founder-owners in card-based interviews could help the researcher understand how the entrepreneurs monitor marketing performance in practice.

4.4.6.1 Financial Figures

Changes in cash flow show a firm's loan repayment capacity and its ability to innovate and expand the scale of production (Clark, 1999). It is a benchmark that indicates a positive relationship with marketing performance (Clark, 1999). This figure can be found on the balance sheets of the sample ESCos.

Twenty of the sample ESCos (58.8%) with good marketing performance have increased their cash flows, while the seven (20.6%) that sell less, have reduced cash in hand and at the bank. No straightforward relationship between cash flows and marketing performance could be identified in the case of seven of the sample ESCos (20.6%).

The financial charts of the selected 34 ESCos can be summarised in three categories (Appendix F). The net worth (green line) shows a straightforward picture of the firm's financial performance, which is the outcome of the formulation "Total Current Assets (Red line) – Total Current Liabilities (Yellow) = Net Worth". The difference between Total Current Assets and Total Current Liabilities also helps the researcher to determine

possible reasons for a given marketing performance trend. Furthermore, cash (blue line) indicates the firm's capacity to deal with the accidents or unexpected change.

Therefore, the first curve chart shows that the ESCos have had significant marketing performance in their target markets. The second chart shows that Firm 13 has had a tough two-year period between 2012 and 2014, and the firm has been growing gradually since then. A possible explanation may be that Firm 13 has received an investment or funding and this was stated in the business partner information page of its website. The third financial curve is also very typical, where the ESCos show increasing marketing performance in their early stages, but subsequently the net worth of the company declines as in the case of Firm 14. This may be due to increased competition since 2014 or a loss of customers.

Although increased cash flows is a rigorous benchmark against which to measure marketing performance, it may be a limited measure for start-ups founded less than a year. Therefore, the coding book introduces non-financial performance as another subtheme to investigate a firm's marketing performance.

4.4.6.2 Non-financial Performance

ESCos provide the latest news about changes in the energy industry, the Green Deal scheme and the firms themselves. As previously mentioned in this Chapter, ESCos provide free information in the form of online news for web users. Although 22 of the

34 sample ESCOs do this, there is no evidence to show that this is used directly for marketing activities but there are implications for firm promotion.

“Having submitted over 200,000 carbon tonnes between October 2013 and March 2014 alone, we know what it takes to get the job done.” (Firm 3 – LinkedIn)

“In the past 18 months alone, we have secured over £30 million of funding for clients and partners from a range of sources.” (Firm 6 – Website)

The findings related to marketing performance suggest that although 90% of the ESCOs provide rich and useful information on their websites and social media, they are not aiming to improve sales or marketing performance directly. Furthermore, the researcher could not identify information on sales opportunity from the Internet.

4.4.7 External Environment Factors

4.4.7.1 Green Energy Policy

ESCOs offer information about the Green Deal financial scheme and example calculations to explain how the energy efficiency products save user’s daily energy costs on their websites. The firms believe that doing so would appeal to potential customers. Hence, 30 of the 34 ESCOs that is, 88.2% post information about the Green Deal, EPC and money saving strategies on their websites.

“We are authorised to deliver the government backed Green Deal scheme across England and Wales.” (Firm 2’s Website Content)

“The Green Deal is offered by the private sector to enable homeowners, tenants and landlords to implement energy efficient improvements which can be paid for through the customer’s energy bills.” (Firm 4 – Website)

“The Green Deal Plan is a new type of unsecured loan, being tied to your property rather than to you.” (Firm 5 – Website)

4.4.7.2 Environmental uncertainty

ESCo owners are aware of, but do not mention, their competitors indicating that the entrepreneurs have some knowledge of the competition and the challenges they pose. However, there is no evidence to suggest the extent of their knowledge and their solutions to dealing with competitors. It needs the researcher to collect further data from card-based interviews in the next section.

4.4.7.3 Venture Capital Investments/Government Funds

Information on the owner-managers and structure of a company could be found from the websites of third-party company information providers, for example, Companycheck. The researcher carried out a cross-sectional check to identify stakeholders who are not founders of the firm to identify external investors.

The investment information has been identified from Firm 14's annual reports (Appendix G). The annual report demonstrates the process of identifying investment sources from two ESCos. Part A shows three stakeholders who are the three owner-managers, which suggests that the company has not received any external investment. Conversely, Part B shows the structure of the stakeholders of Firm 14. The list contains three owner-managers and the other VC companies. The money received from the VC helps Firm 14 to acquire more competencies and skills in marketing.

Based on the above-mentioned method, the research identified eleven start-ups (33.4%) received or are receiving financial investments from VCs or have some form of governmental funding, whilst the other 23 ESCos (67.6%) do not.

“We have direct access to ECO funding from the Big Six Energy Companies that includes HHCRO, CSCO, CSCO Rural and CERO.” (Firm 4 Website - GDAO)

The findings on external environmental factors suggest that nine ESCos (26.5%) show increased cash flow on receipt of external investment. The findings also show that 11.8% (4 firms) of the sample with reduced cash flow and no investment have poor business performance.

Environmental uncertainty, such as changes relating to the Green Deal financial scheme and changes of market structure, encourages an entrepreneurial firm to use low-cost

and effective digital technologies in marketing. However, it is hard to explore environmental uncertainty using secondary data.

The analysis thus examines the Green Deal as a representation of the UK government green policies, to understand how the entrepreneurs' view and provide green policies. The 34 ESCos provide tutorials and explanations about the Green Deal finance scheme processes to demonstrate their knowledge of this field. Although the information about Green Deal is the same, the ESCos have used different technologies to reach their target customers. Three ESCos have added the Green Deal process in various issues of their newsletters, while five other ESCos have published case studies conducted by them to explain how the Green Deal works, and another three ESCos have used YouTube videos to give more details. Furthermore, two ESCos have also used e-CRM systems to manage their marketing processes effectively.

The government funding/ VC investment, was the final subtheme in the coding book. By analysing their abbreviated annual financial reports and frequency of the change-of-ownership, the research found that ESCos take several risks and that entrepreneurs share the ownership with their business partners or Venture Capital investors to reduce these risks; 31 of the 34 ESCos are hence owned by multiple owner-managers. These findings suggest that, although the VC investment or government funding can extend the capabilities of those UK ESCos who receive them, several ESCos are proud to be independent green energy service providers and appear comfortable with this fact. Receiving a money investment may mean the entrepreneur has to give up his dream and compromise with the capital investment, by giving up control of the venture.

4.5 Findings from the Key Participating Case Firm Interviews

The findings are discussed in the dimension terms of the TEMP model.

4.5.1 *Entrepreneur's Idea and Intention*

Key participants create their entrepreneurial ideas and intentions by considering the energy service industry as a new opportunity and a new market, so attempting to share the energy efficiency knowledge and experience of their own house improvements.

Entrepreneur B describes the entrepreneurial idea as “Firm B because in CH4 we started to recognise that the energy efficiency sector that we were in which is the future of our business, the funding mechanisms--”. Marketing Manager C believes having entrepreneur's idea and intention at the beginning of business is very important and describes the entrepreneurial intention as follows:

“Because of the evolvments in the marketplace, it was initially the labour government back in the time introduced Green Deal, and it then went through legislation. That is where it came formulated into the backend of 2012. I think it was October 2012; it went into the Energy Act. It is the result of that. It has come. It was a natural progression for other organisations and us in our industry. It is important.”

Marketing Manager A views this differently. He remembers that his entrepreneurial idea was generated from the past personal experience as: *“I really got interested in*

energy efficiency in houses because we were trying to help people who were finding it very hard to afford to heat their homes.”

These findings indicate there is evidence of the dimension ‘entrepreneur’s idea and intention’ and they have resonance with the dimension ‘work experience’ in EO and ‘green policy’ under the category ‘external environmental factors’.

4.5.2 EO

4.5.2.1 Motivation

Motivation refers to both personal motivations to set up new firms in the energy service industry and organisational motivation to run a business. There are general points of their organisational motivations that three key participants viewed as relevant: solutions to environmental issues as the new business opportunity: *“From there, he (owner-manager of Firm A) realised that advice is one thing, but getting people actually to install measures, that is something else. So, they moved into that market as well. (Marketing Manager A)”*, *“I am motivated by environmental issues. I made up my mind very early on in my career I could specialise in just doing that. (Entrepreneur B)”* and *“The fact that what we have seen happening in renewables, we knew that there wasn't long jeopardy, so we moved. When we saw the energy service, we said, ‘Right, okay, that great.’ We have got more than one business now. (Marketing Manager C)”*. Therefore, concern about environmental problems is the major organisational motivation that drives Firm A, B and C to conduct business in the energy service industry.

However, the personal motivations of key participants are significantly different. Marketing Manager A represented further concerns about environmental pollution as:

“Whereas now, not only does it make sense in terms of saving the planet, if I can use that phrase, but it makes good business sense as well because you're associated with saving money through saving energy, through saving resources, perhaps being a big saver with the resources that you use, using waste products or products that were seen as waste, that sort of thing. That really does appeal to me, that sort of thing. That is where I've tried to work in that sort of environment.”

While Entrepreneur B considers that the sustainable industry has less opportunity for Combined Heat and Power (CHP) producers, he still decided to start the business in energy service industry where he has more opportunities. Hence: *“Firm B was set up because we could see the type of business that the Firm B2 (other firm set up by Entrepreneur B) is doing is coming to an end.”* Meanwhile, Marketing Manager C appreciates the business concept of Firm C and enriches work experience in a completely new industry, so her motivation is described as:

“I wanted the proper responsibility. I like the way Firm C works. I actually engaged someone to find a job for me. That's how I changed roles.... That's how I changed roles to more into another role in the energy efficiency market, in time. Firm C seems to be the right organization for- (me)”.

Participants have affirmed the dimension ‘motivation’ in the TEMP model. The evidence that they have provided suggests that entrepreneurs are likely to have similar business motivations for the energy service firm start-up by seizing environmental issues as business opportunities. Additionally, the personal motivations that develop new products and earn profits are also relevant.

4.5.2.2 Entrepreneurial Experience

The dimension ‘entrepreneurial experience’ has been described by Entrepreneur B as being beneficial to the start-up of Firm B because the entrepreneur is familiar with entrepreneurial business procedures and how to go to market in this industry:

“We set the company up. We got the insurances that we needed, we got the web design done, the branding done, and then we started approaching -- we've got CFT safety distribution, ... has hundreds and hundreds of care home clients, so we started mail- shooting them. We did Sustainability Live, we are going down to do Energy 2015 at the NEC which you'll see on my email signature.”

The dimension has been affirmed by the only one key participant who is the entrepreneur, and was seldom discussed by Marketing Manager A and C. It suggests that ‘entrepreneurial experience’ has the positive effect on entrepreneur’s marketing behaviour and this now needs to be further demonstrated with further entrepreneurs in the card-based interviews for it to be included in the final TEMP model.

4.5.2.3 Work Experience

Dimension 'work experience' seeks to understand whether the key participant's past work experience contributes to the current business or not. It has prompted a wide range of responses from the three key participants and under this dimension several benefits were related to networks and partnerships.

Since he graduated in 1989, Marketing Manager A views his previous work experience in a local wood firm and with local councils as fundamental to how he has accumulated knowledge about the energy service industry and UK green policy:

“In 1989, I moved to [REDACTED] and became what's called an environmental health officer. ...In 1995, I was working for [REDACTED], and there was a major bit of legislation came in that put new responsibilities on to local government.... I tended to specialize in the housing side of things.”

Entrepreneur B used to work as a sustainable product developer for home care institutions and private clinics as follows: “No, not for NHS, more care homes, dementia, dementia wards, autism wards. We get autism patients, if they can get their fingers behind something, they will rip it off the wall, so radiators and things don't work. We put these in the ceiling and we do fix them in the ceiling, we cut the ceiling out and put them into the ceiling, so nobody sees them. That is structured glass, but when we do these for the care homes, we do them the same because of the ceiling. All you see is square, you see four lines, and it doesn't trigger the person with autism and if it did,

they cannot get the fingers behind because it is foolish.” Entrepreneur B identifies several customer needs during past work experience by observation and having dialogues with those patients who are his customer’s end (service) users.

Additionally, Marketing Manager C views the dimension as:

“When I was at British Gas, prior to that. My early career was all in marketing. I worked for a marketing agency, I learned and used marketing for a software company and I joined British Gas again in the marketing role. Gradually went for British Gas my roles changed and evolved. But my last role was heading up about £25 million worth of marketing spend each year at British Gas. It's a large team of people doing that.”

The evidence from participants shows the dimension ‘work experience’ is highly relevant to a firm’s entrepreneurial marketing activities. Entrepreneur and marketing managers both learn knowledge and skills about entrepreneurial behaviour in marketing actions.

4.5.2.4 Risk-taking

Risk-taking is a dimension related to experience and forecasting in uncertain environment and is discussed by participants using a wide range of examples, from partnerships with large companies to interactions with customers. Risk-taking was described as important. Marketing Manager A noted that there is a risk in collaborating

with a large company which then attempts to manipulate/control the new venture like one of its subsidiaries, but do not share resources, information and customer contacts fairly with them. Manager A describes further risks as follows:

“What has happened several times is that money has come and gone. Firm A has met their obligation. They’ve done what they were required to do by their regulator Ofgem. They’ve said, “No, we are not going to subsidize anymore. Then there’s been a period where Firm A has had to try and sell their services and energy-efficiency products without any subsidy. That’s happened several times between 2010 and 2014”.

Marketing Manager C adds risk associated with customer decision making: *“The problems I had was that sometimes you’re trying to persuade people to invest in their houses. This could be owner-occupiers or it could be landlords who own houses where tenants live. Most of the people that you deal with.... most of the people who own houses...they won’t be allowed you to change their houses to save money. That’s what their interest is in, saving money, not necessarily on the environmental side in reducing carbon dioxide emissions and things like that. Some people do but not everyone.”*

Entrepreneur B has also observed marketing challenges as risks and describes these as: *“We have marketing challenges but we are very equipped to the setting of these companies up.”* and risks can come from the government requirements: *“It’s working with government to say, ‘You need to resolve this because we can’t work in the current*

environment because they don't match.' It could be anything like that. We've had all kinds of issues."

Therefore, risk-taking is viewed as an important dimension in the TEMP model since it relates to collaboration, networks and partnerships, dealing with customers and identifies risks from the external environment such as government requirements. Collaborating with large energy suppliers and local authorities, new ventures should change or abandon some rights to meet requirements of collaboration. Using marketing teams from a large company may prevent new ventures from contacting and managing customers directly and, it may slow down the growth of new ventures.

4.5.2.5 Proactiveness

Investigation of 'proactiveness' centres upon the recognition of opportunities and marketing activities after the opportunity is identified. 'Proactiveness' is affirmed by two of the key participants who closely work with the new venture's marketing activity. Marketing Manager A observed owner-manager of Firm A extends the business proactively from energy efficiency product installation to a wide range of services and also in-actively establishes the partnership as follows:

"Now, we've moved on from what they used to do. They've majored on doing installations now. They also build houses to pass with health standards in some cases. They offer consultancy in terms of energy efficiency and sustainability consultancy to the private sector and to the public sector as well, to local authorities."

Moreover, Entrepreneur B describes it as:

“We were the first to market and I mean it (energy service business) hadn’t been hugely successful in those days. I think it was three years ago.”

However, Marketing Manager C did not mention any aspect of proactiveness during the interview. One possible reason is the Firm C had already been set up when Marketing Manager C joined in, thus Marketing Manager C has limited opportunity to observe this entrepreneurial characteristic.

4.5.3 TO

4.5.3.1 Innovativeness

Innovativeness refers to the entrepreneurial characteristic that drives entrepreneurs to seek innovation. Key participants specify innovation in terms of productive technology. Despite Green Deal regulating the product type and category, entrepreneurs and firms still attempt to develop products with innovative features. Moreover, innovativeness does not only mean to create new technology but also a combination of existing technologies as reinvention.

Entrepreneur B describes it as:

“The solution we came up with was far infrared. The German man who introduced us to far infrared,.... was a guy from Belgium.” And “He introduced us to this product, the inflector product. We thought it was great

and we need these technologies. We approached the manufacturers and we signed up the whole...so we have the sole distribution (system) for the UK and Ireland.”

Marketing Manager A views it as: *“We're not that different to the competitors. We may do it differently. We have solutions for dealers.”*

Furthermore, Marketing Manager C describes it as: *“The latest solar panels... we ensure that we get products that are the latest technology and most efficient... That's how our innovation comes from the products. We are also, doing innovation in our financial products. And we are the first GDP (Green Deal Provider) going to provide the offer to finance.”*

Innovativeness is identified as appropriate as a dimension in the TEMP model. Interview participants suggest that innovation of product technology is important for ESCos' survival and for their marketing performance improvement, while there is some innovation related to services and credit finance.

Entrepreneur B states:

“We're not that different to the competition (Products). We may do (marketing) it differently. We have solutions for dealers.” and furtherly, Marketing manager C describes it as: “The late solar panels we ensure that

we get products that are the latest technology and we sell products with gifts. That's how our innovation come from the products, from marketing. We also are doing innovation in our financial products. and we are the first GDP going to provide bonus offer to finance.”

4.5.3.2 Technology Adoption in Decision-making

The term “Technology Adoption in Decision-making” is used by one key participant entrepreneur during the interview. Marketing Manager C describes it as: “*We use Excel*”. One possible reason is that most entrepreneurs using Excel but do not consider it as the most frequent technology used in their decision-makings. Therefore, this dimension exists in the TEMP model for further investigation in the likelihood that it may be relevant.

4.5.3.3 Technology Superiority

The term ‘Technology Superiority’ focuses on the identification of what kind of unique and important technology provides a new venture with more competitive capacities to perform more effectively within the energy service market.

Marketing Manager A describes it as: “you can't normally install products below certain temperature and we've got a product that does get below different temperatures, we do that kind of reinvention.”

Entrepreneur B discusses technology superiority as design in the product development given as follows (and as noted earlier):

“We get autism patients...we put these in the ceiling and we do fix them in the ceiling, we cut the ceiling out and put them into the ceiling, so nobody sees them. That's structured glass.... all you see is square, you see four lines, and it doesn't trigger the person with autism.”

Also, Marketing Manager C emphasises that the latest solar technology they use helps product differentiation from their competitors (as noted earlier): *“The latest solar panels we have ensure that we get products that are the latest technology and most efficient.”* Key participant interviews demonstrated the existence of ‘Technology Superiority’ in the TEMP model related to innovative product development and differentiation.

4.5.3.4 New Product Development

All three participants have discussed new product development during the interviews. The new product development process has been represented and discussed in terms of ‘innovation’ and ‘technology superiority’; hence they appear closely linked dimensions.

Marketing Manager A explains their product development as: *“You can program it-- there's an App for it. We program all rooms in this building as a customer can in his own house. You can have, one ISTC can program up to 10 heaters.”*

Entrepreneur B explains it as:

“The solar heating panel.. the main difference is we can take the first temperature to 180 F. To do that, we have to have it in the ceiling because at 180F you would burn yourself if you touched it. It has to go in the ceiling. All of the other panels will only go to 95°F. The fact that we can go to twice the heat means that we can get the desired temperature more quickly. As I've described, once we get there, we just maintain it. The competition will take twice as long maybe three times as long to get there. As we turn on an hour before we come in, with their cheaper panels you turn on maybe three hours before you come in, and it's doing this all day, on off, on off, on off, on off.”

Marketing Manager C also consider it as follows:

“We're developing new products with time, and more robust ...next January (2016), we are planning to produce new boilers and let these individual installers sell them for us.”

The dimension “New Product Development” is therefore identified in the TEMP model and it appears closely linked to entrepreneur’s ‘innovativeness’ and ‘technology superiority’.

4.5.3.5 Digital Marketing

Marketing Manager A describes this as follows:

“I guess the industry that Firm A in is not a lot different from lots of other industries. Lots of the other ways of marketing and promoting themselves to attract customers are very similar. They have a website. They have a social media presence. They have a twitter account and regular blogs on that to get their name known.” ... “The website on its own is not going to generate a lot of business ... the website introduces the company and perhaps gives people some confidence, but it’s not a selling medium in its own right” and Marketing Manager A also views social media as: “Whereas I think the next generation of people might, because they’re used to working with Facebook and Twitter, they’re happy to see it in there as well. The other good thing about Facebook and Twitter is it is so cheap.”

Marketing Manager C echoes this and explains the cost effectiveness and efficiencies of digital marketing: *“You can build up a distribution as it were, and, people will follow you on Twitter or, people will friend you on Facebook or LinkedIn, having contacts on LinkedIn....you get it out there once and it might go to thousands and thousands and thousands of people. That’s a nice cheap way of getting your message across.”*

Additionally, Entrepreneur B describes the process: *“We do mail shots, electronic marketing.”* and *“Email shots...we buy databases of buyers or sustainability managers, CRM managers of different businesses' establishments. We mail out with attachments and then follow them up with phone calls.”*

“Digital marketing” is identified as a dimension of TEMP model. Participants describe the use of websites, Facebook and LinkedIn pages, Twitter conversations and customer data in their marketing activities. It gives a further clue for the researcher to collect secondary data on Facebook pages, Twitter and LinkedIn.

4.5.3.6 Search Engine Optimisation (SEO)

There is an emerging dimension identified from the descriptions of Marketing Manager C. Here, SEO is used to help customers locate the new venture easily and quickly on a search engine: *“It's for the website. It's for improving content...the website, investing time in the search engine optimisation and paying for the Google adverts. This combination”*. The dimension is a new dimension added in TEMP model as the researcher considers the evidence that this may demonstrate how entrepreneurs use emerging marketing technology.

4.5.4 MO

4.5.4.1 Market Knowledge

Under this dimension, the researcher attempts to understand how familiar entrepreneurs (and relevant employees) are with the energy service marketplace. Interestingly, two of three interviewed participants seem to underestimate how much knowledge about the market they familiar with. Marketing Manager A describes that as: *“I don't have much knowledge on it (market).”* However, when ‘customer identification’ has been discussed, his response demonstrates lots of market knowledge as follows:

“In [REDACTED], it was about 50,000 houses that were there but only about 8,000 were actually owned by the council. We had to get a lot of information on the other 42,000 houses, and prepare this report, which was basically saying how good or really, how bad the houses were in terms of their energy performance.”

Marketing Manager C sources their knowledge mainly comes from local authorities and local customers directly:

“They (local authorities) will give us the local knowledge as it were. They (local authorities) can't release confidential information, necessarily. They (local authorities) can't tell us the name of the person but they might say something like this estate, this ward in this particular town or city.”

Entrepreneur B describes market knowledge as: *“Information, you mean? We get this from customers by asking them in surveys. ... but it is the lobbyist for lobbying, try and push the government, because we are very influenced by what the government does. That's a huge impact.”*

Therefore, market knowledge is included as a dimension in TEMP model. There is significant evidence that market knowledge helps firm growth and understanding environmental issues and influencing the government is important. Networking and

partnerships generate marketing knowledge, particularly with local authorities who understand customer requirements and the places to target marketing activities.

4.5.4.2 Networking and Partnerships

Networks and partnerships have been represented in two dimensions in the TEMP model as the dimension term relates to several dimensions, such as customer identification, customer requirement, and administrative marketing methods. Networking in this industry context means development of a different range of networks with local authorities, energy suppliers and other ESCOs. It intertwines with the other important dimension related to EM activity and partnerships to seek new opportunity and markets and understand customers and competitors.

Marketing Manager A describes this as follows: *“We would work with the local authorities. We would work with housing associations.”* And he later adds further information related to ‘customer identification’ and ‘product’ discussed as follows:

“We have agent distributors. We have other companies who we sell this on a trade basis and they supply to their customers. We supply (products) to directly to customers, but we also supply our own agents and distributors so they supply to their customers as well.”

Entrepreneur B also develops links with several marketing agencies in different cities in England and Wales to increase the numbers of customers and market share: *“We have got one (agency) in [REDACTED], and one in [REDACTED].”*

Similarly, Marketing Manager C describes the importance of commercial network development as follows:

“I also integrate with, we have a network we manage the network with Snug Network it has about 80-100 independent organisations that install energy efficiency products and heating” and “We work events to support their marketing and we deliver products through them”.

Therefore, networking and partnerships are affirmed as a dimension in the TEMP model. Key participants evidence them from being instrumental to firms and EM performance.

4.5.4.3 Word-of-Mouth Marketing

Word-of-Mouth marketing is the most important and effective marketing approach used by all key participants. Most key participants use it as new market and customer identification tools, while the third key interview participant has mentioned Word-of-Mouth is also used with social media to identify and engage new customers quickly in the young generation.

Marketing Manager A describes this as e-word-of-mouth (e-WoM):

“people maybe will follow one another...the description of word of the mouth. ...the thing with social media is that, yes, you might have a very small

following yourself, but if people then go and repost or retweet...it's like a pyramid isn't it? It starts to spread out. Once we've got more followers, it's developing all the time and we will get more followers eventually. But at the moment, we're hoping that the message we give to those people will go to their followers and then perhaps to their followers, and their followers."

Marketing Manager C centres on traditional uses of it as:

"Word-of-mouth is good. The door knocking I told you about, what we found happened is that you might go down the street during the day and perhaps you don't get a response from half the houses. You would only ever speak to half of the occupants because the others were out at work or wherever. If the people you speak to actually take action, what you find is ...that the people who weren't there, they've seen what is happening and then they will contact us or there might be neighbours saying, "Oh, you want to speak to such and such." Then, they will come back to us. That is purely anecdotal, but that does happen."

Entrepreneur B describes this as: *"Word of mouth would work with people who perhaps, they might get the letter and then think it was a scam or something and throw it away. However, someone else would take advantage of it and then the person who is throwing the letter away is thinking, 'They have done it. Perhaps I should have looked into it.'* Then they come back to us."

Word-of-Mouth marketing is included in the TEMP model and is frequently in this industry for the new customer and opportunity identification. It is implemented in either or both, administrative marketing methods or digital/social media marketing methods.

4.5.4.4 Administrative Marketing

Administrative marketing refers to a wide range of traditional marketing methods used by entrepreneurs and marketing managers. Administrative marketing methods include door-to-door canvassing, radio advertisements, leaflet and outdoor campaigns, postal mail, conference and exhibition attendance and lobbying support from government events. A quality of evidence about “administrative marketing” activities are discussed by key participants.

Marketing Manager A states: *“A lot of this traditional marketing is in terms of identifying, targeting people who would benefit from the services that we offer, and then trying to get them to contact you directly.”* And *“I think the common, the well-recognised approach is you have to knock on someone’s door on the ground, six times before they’ll do something. That could be a newspaper advert that could be hearing someone on the radio.”*

Marketing Manager C represents it as:

“...door canvassers, so they're specialists at this. We are not necessarily specialists that knock on their doors. People often when they speak face-to-

face to someone, they are more likely to actually take action than if they get a letter. From our letters, we might get a 2% and sometimes a 15% response rate. When you knock on people's door, which might be something between 10% and 30%. You get a slightly better response rate when people are speaking face-to-face."

Entrepreneur B uses a number of administrative marketing activities including:

"We do the exhibitions. They'll work with door-dropping leaflets. They will do direct mail campaigns, door-knocking is another one. Those are the kind of activities that don't tend to do what I call 'above the line', you know, anything above the line, it all tends to above the line. We do, do a bit of radio" and also "and networks themselves, we do things like I said before, which is door-drops, the leaflets, door-knocking, all that kind of thing to continue direct marketing."

Participants have provided evidence of the dimension "Administrative Marketing" as being relevant for the TEMP model. It includes lots of traditional marketing methods while identifying emerging marketing methods, such as direct marketing. "Administrative Marketing" has close links with another dimension such as 'networks and partnerships' and 'market knowledge'.

4.5.5 Customer Needs

4.5.5.1 Customer Identification

To identify more customers, Firm A identifies and interacts with customers by moving from B2B marketing to B2C: *“What's happened now is that they've had to move into as well into the B2C markets... The organisation then would be the person who interfaces with the customer, whereas now, Climate Energy do it directly with the household.”*

Entrepreneur B also works with B2B and B2C customers, large institutions and individual house owners: *“Schools, universities, colleges, businesses, anybody and anyone. Homes, domestic homes for (energy) conservation reasons. Anywhere you've got a glass window that faces the sun, that's an obligation.”*

Meanwhile, Marketing Manager C uses networks to identify customer: *“Our marketing way, as I said, our Snug network can lead customers to us generally. I'd look at a lot of local markets, who I think are much better at it.”*

Therefore, the participants have provided evidence of the ‘Customer Identification’ dimension and it is appropriate for use in the developing TEMP model.

4.5.5.2 Customer Requirements

Evidence provided by participants demonstrates that knowledge of customer requirements is relevant to their business. Surveys are carried out to ascertain customer (B2B or B2C) requirements, while market knowledge supports this dimension in that evidence is provided through networks and partnerships with customers, other companies in the industry, government and local councils. Marketing Manager A as describes identification of customers s for their requirements: “*We give them these marketing codes, right. From that, when someone phones and contacts us we, will say, ‘How did you hear about us?’ And they will say, ‘Oh, I’ve got this reference,’ or they say, ‘Oh, I read it in the paper,’ or, ‘I got a letter,’ or, ‘Email,’ or, ‘My neighbour told me’.*”

Marketing manager C also states that: “We treat every customer as an individual and we talk to every customer three times at least to find what they need and how much they can afford. So we find the right solution to suit and maximise your energy savings as well.”

The evidence from all the interviews suggests that identification of “customer requirement” is a relevant dimension for the TEMP model.

4.5.5.3 Customer Satisfaction

Surprisingly perhaps, customer satisfaction has not been identified with the three key participants. The participants did not offer any insights, discuss or provide any distinct evidence of how they achieved customer satisfaction with their B2B or B2C customers or, how they gathered feedback to see whether they had achieved customer satisfaction.

Therefore, this dimension will be investigated further with secondary data analysis and card-based interviews.

4.5.5.4 Customer Loyalty

“Customer Loyalty” is identified in the TEMP model since all participants agree that it is very important. Entrepreneur B describes it as “*Of course, it is really important for any business.*” The entrepreneurs and marketing managers have acknowledged most customers may purchase their products and services again since the guarantees of products/services are 10 -15 years old. However, they still recognise the importance of dimension ‘customer loyalty’ that drives the existing customers to recommend the firms and products/services to new customers. Moreover, Entrepreneur B believe that customer loyalty helps the entrepreneur to collect useful radical idea and suggestion for NPD and innovation.

4.5.6 Marketing Performance

The interview participants use several methods to measure marketing performance. Marketing Manager A observes: “*The company (Firm A) has grown from very small beginnings there to now it employs 150 people, approximately. The turnover last year was about 40 million pounds, so it's had an exponential rise since 2010, in terms of its growth.*” Entrepreneur B describes it as: “*It's going up, but it's a new company so it's slow but it's above our expectations*” and also Marketing Manager C observes it as: “*We sold 200,000 new boilers to our customers last year.*” These responses identify “Marketing Performance” as relevant for inclusion in the TEMP model as these firms are clearly growth focused.

4.5.7 External Environmental Factors

4.5.7.1 Green Policy

Key participants identified the use of Green Deal, while identifying further green policies involved in their energy service businesses. Marketing Manager A describes it as:

“What the government has done has introduced this scheme called the Green Deal. The Green Deal is not around anymore, so it's not giving people money to subsidize the cost of energy efficiency measures.” And “HECA 1995. What local authorities had to do is they had to prepare a report of, sort of a, profile of the houses in their district. It's not just the houses that the council might own itself in terms of social housing. It's everyone including owner occupied, private rented sector and, in Braintree, It was about 50,000 houses that were there, but only about 8,000 were actually owned by the council.”

And Marketing Manager C describes the Green Deal as follows: *“In fact it's a very good deal because basically, from a customer's point of view, you borrow the money, you repay back via your electricity bills. The logic is that your energy bills stay static because the money that you were to save, you then borrow.”* These interview participants therefore identify “Green Policy” as relevant for inclusion in the TEMP model.

4.5.7.2 Environmental Uncertainty

From these interviews, uncertainty mainly comes from changes of customer requirements (related to the product and service) and insufficient support by government and/or from large energy companies. Marketing Manager A states: *“one of the reasons why the big energy companies like British Gas, pool their funding was that... I don’t know if you remember, but last year, there was a lot of fuss about how much households were actually paying for their energies or their annual bill for gas and electricity.”* And, Entrepreneur B observed that: *“customer needs change very quickly”*. Thus, participants have discussed and described aspects related to “Environmental Uncertainty” and hence, this dimension is relevant to the TEMP model.

4.5.7.3 Venture Capital and Government Funds

Marketing Manager A describes this as follows:

“the government incentives being the Feed in Tariffs, were being squeezed...there are traditional funding options now, but they aren’t 100% asset funded...it’s not asset funding but what we call Venture Capital Term Funding.”

Marketing Manager C views funding as important for firm growth: *“It’s just waiting for new investors which we should have by January”*. And Entrepreneur B describes this: *“the investors will come to the market and pick up the existing operation and then they enable us to take loans out for a part of our customers.”*

Therefore participants mention aspects related to VC and government funding as being significant in this sector and of great importance for firm growth. As such, this dimension is relevant for inclusion in the TEMP model. Therefore, the findings show that all the dimensions on the conceptual model, the TEMP model, are identified at different levels by the secondary data of online non-participant observation and primary data of three key participant interviews. Additionally, the findings emphasise the validity of the TEMP model, while, there are several new dimensions identified and generated from both secondary and primary empirical data with the participants mentioned above.

4.6 Findings from the Green Deal Firm cases

This section presents findings from the Green Deal young venture case, and the card-based interview to present a final corroborated TEMP model, along with its dimensions. Firm D, is one of 34 selected ESCos for secondary data collection and analysis, so representing a useful and relevant example for a case interview.

4.6.1 Entrepreneur's idea and intention

Entrepreneur's idea and intention findings are generated from evidence from the card-based interview Entrepreneur D and, his forecasting of the energy service industry. They are also from his previous experience of customer needs identification. Entrepreneur D observes it as: *"It was XXX's (the other entrepreneur's) vision, really, to do the Green (business)-- he saw that it was a concept that worked, he felt."* Because

“He is a landlord as well, he owns properties” while the other entrepreneur had lots of experience and skill in saving home energy consumption and, he is willing to share the experience and knowledge with more property owners. This shows that the original requirement of the entrepreneur could create entrepreneurial idea and intention.

“He looked at for his own properties to improve his own properties and then I think he thought he could expand it. It was initially for his own properties he thought it was an idea that he could sell and so then grew it as a provider.”

4.6.2 EO

4.6.2.1 Motivation

Entrepreneur D recalled that the initial motivation for his entrepreneurial activities was to use different energy efficiency product to reduce energy consumption and his motivation was based on lots of relevant knowledge and skills. Therefore, Entrepreneur D believes modest attitude and constantly learning knowledge about the energy service industry are two major internal factors which drive everyone in Firm D, as:

“Obviously, as we came on board, at the beginning, we were all part of a new business. That was motivating because as a little team, we all influenced decisions. Everything was new, so we could change the processes together as they needed changing. I think that motivated people because they felt they could make a difference and they were heard really. I think working for a new company that was a really good experience.”

4.6.2.2 Entrepreneurial Experience

The entrepreneurial experience of the co-entrepreneurs, Entrepreneur D1 and D2, helped Entrepreneur D to set up Firm D efficiently by recruiting skilled people as employees and with developing networks, dealing with various relationships with local authorities, communities and energy supplying companies. Successful entrepreneurial experience helped the Entrepreneur D to reduce costs during the venture setup and, previous experience of firm failure helped the entrepreneur not to repeat the same mistakes. Hence, one entrepreneur's entrepreneurial experience can be beneficial to all entrepreneurs that aim to set up the firm together.

Entrepreneur D observes it as: *"I don't but the directors of this company do... It's two people, [REDACTED]. They set-up Firm D, they set-up XXX (the other firm)."*

Furthermore, having entrepreneurial experience helps entrepreneurs of Firm D to seek new opportunities and business on the marketplace: *"Obviously, we're often looking at new projects, we're looking at new opportunities. It's (entrepreneurial experience) very varied but useful, we're constantly looking for a new opportunity, new business."* The findings indicate that the contribution of entrepreneurial experience is fragmented, non-systematic and helpful. It is useful because the entrepreneurs can use the entrepreneurial experience to identify new opportunities and develop new business projects. In addition, these findings demonstrate that "entrepreneurial experience" in the TEMP model and the dimension relates to other dimensions such as MO and Customer Identification.

4.6.2.3 Work Experience

Entrepreneur D uses his prior work experience to maintain previous business resources and contacts for his new venture; Firm D. Entrepreneur D describes work experience in relation to two entrepreneurs of Firm D. Previous work experience allows the entrepreneur to establish relationships with local energy suppliers and authorities, helping the entrepreneurs to familiarise themselves with green energy policy. Entrepreneur D describes this as follows:

“I (Entrepreneur D) worked for XXX (A boiler firm). I'd worked very closely with installers previously, so I had the network but I'd also understood the industry and the people that we were working with. I understood some of the products. For the other entrepreneur (Entrepreneur D2), he obviously was a landlord, property owner, so he understood improving your property, the value of it. Entrepreneur D2 uses to work for YYY. We worked... for, I want to say, something like 30 years. Entrepreneur D2 understands policies and procedures a lot. He worked B2B, which is where we promoted and we worked closely with utility companies, with data flows. Entrepreneur D2 obviously understands all of the tricks”.

The findings show entrepreneurs' work experience contribute to the development of Firm D. However, the work experience is not necessarily relating to Firm D's current business.

4.6.2.4 Risk-taking

Entrepreneur D notes several risks the Firm D is currently dealing with, as: *“So far I can say that the Green Deal failure is a risk. The industry is quite a risk.... When the government are announced the Green Deal failed. Obviously, everyone is quite very shocked and then we had two rounds of redundancies. We had to still process the (sustainable product) plants that were going through the system in July and then I think by November there were only two staff employed.”* Entrepreneur D acknowledged there were lots of Green Deal applications have not been processed when Green Deal failed. *“We had redundancies.”* However, entrepreneurs have solutions to decrease loss and risk as: *“Obviously we looked at other finance options. If we didn't do Green Deal finance could we do - other finance because we've got our FCA accreditation”*. One possible explanation is that the entrepreneur makes provision for what is going to happen next: *“guess all entrepreneurs are quite calculated definitely but they all I suppose in every business they set up there is some element of risk”*.

4.6.2.5 Proactiveness

Entrepreneur D observes that the entrepreneurs and employees all perform proactiveness in their daily activities as: *“Yes, we were very proactive in contacting installers. Proactiveness in promoting Green Deal finance. Entrepreneur D2 is also proactive on the green green stuff. Entrepreneur D2 attends all the meetings, the GDP (Green Deal Providers) meetings.”*

Furthermore, for future marketing actions, Entrepreneur D says: “We need to be more (active) with Facebook and Twitter, I think. We need to be more proactive putting industry news, news articles.” The interview participant therefore identified the dimension in TEMP model as relevant and shows a relationship between “Proactiveness” and “Social Media Marketing” and “Administrative Marketing”.

4.6.3 TO

4.6.3.1 Innovativeness

Entrepreneur D acknowledged that innovation in NPD and marketing activities is different to other ESCos because Firm D is a service-based young venture. Innovativeness means new service process design, new operational process and constant learning. Entrepreneur D discusses it as follows: “*Since Firm D was quite new and we've had to be innovative with everything really procedures, policies, up until it ended we were constantly changing the way we worked as we were learning constantly. We brought technology later in the process.*” and this entrepreneurial characteristic links to the entrepreneur’s idea.

4.6.3.2 Technology Adoption in Decision-Making

Entrepreneur D demonstrated several technologies that are used in the decision making process. The marketing team of Firm D use Zoho CRM and customer service applications on iPad to collect customer feedback and to support decision-making. Furthermore, Entrepreneur D and D1 also use white board, customer queries in emails

to schedule and track the marketing performance of Firm D. Finally, all the data supporting this decision-making is recorded in the most frequent decision-making software, Excel, to generate reports that describe the business and marketing performance monthly. Firm D has decided to use simple but very effective technology for decision-making support. Entrepreneur D describes this simply as: “We did it all in Excel.” Therefore, this finding demonstrates that “Technology adoption in Decision-making” is relevant to the TEMP model, while the dimension relates to other dimensions under the EO and TO.

4.6.3.3 Technology Superiority

Technology superiority means whether the young venture has a technology-based competitive advantage in different firm activities (Kwon 2010). The activities could include cutting-the-edge technology in NPD and innovation, unique technical procedures in NPD and operation and reinvention of the traditional product and marketing technologies (Gerhard et al. 2011). Most entrepreneurs have demonstrated their understanding about cutting-the edge technology in NPD and innovation in the card-based interviews. However, Entrepreneur D has failed to realise how much knowledge and skill about technology superiority he had mastered already. This is due to a narrow understanding of the dimension.

Although Entrepreneur D denies the existence of “Technology Superiority” because Entrepreneur D is not sure of the meaning of this dimension, Entrepreneur D then demonstrates how it is for them in a Green Deal service business as: “*Yes, no we don't*

really have products, Yes. The Green Deal restricts, there's a list of products you can use, they have to be authorised by the Green Deal, so for example you have to give five-year warranty on a boiler that was a minimum. We had a list of products that you could install, so as long as our installers installed from that list I guess if you could have looked at adding a new product to the list but it was just a given list.”

The findings indicate that ‘Technology Superiority’ is important because to take part in Green Deal, a firm needs to supply from a specific list of technology driven product. These findings suggest that although ‘technology superiority’ is important being tied to Green Deal may restrict the firm’s willingness or ability to innovative, or to compete with other companies by offering superior technology products.

4.6.3.4 New Product Development (NPD)

Firm D focuses on Green Deal and ECO involved service development as: *“We provided the finance and we did ECO, so as a provider we got the ECO.”* Different from energy efficient producers, Firm D as a service provider understands NPD as: *“Yes, creating new services for the marketplace, improving existing services... we didn't progress with anything yet but we're always looking for new ideas.”*

However, Firm D has also realised the rapid changes in the green industry marketplace and the growing risks of solely providing Green Deal services. Entrepreneur D hence recognises that in the future NDP will include the energy efficient product development as:

“We did a lot of solar panels and we are now looking at the solar batteries and then we will go back to our customers with the solar panels and promote the solar batteries to go alongside them”.

The interview responses confirm that the dimension NPD should be contained in the TEMP model. NPD means upgrading existing services to continue to serve customers on the market. It emphasises the development of energy efficient products as important as upgrading existing services for green energy service providers.

4.6.3.5 Digital Marketing

Currently Firm D uses a website and Facebook page as its main marketing methods to increase service promotion and decrease costs of new customer identification. Entrepreneur D states: *“We had a website. We did live chat, we had Facebook. We did a lot of trying to promote. We go to installers and assessors, we don't go to customers really.”*

Entrepreneur D explains:

“In respect to something like email bombs something like that, we did a lot of this, the Green Deal website has all the providers and all the installers, so we

would do a lot of promoting to installers with offers. ... We'd offer different payment terms obviously, takes a long time for us to get there to provide financial solutions. We could offer payment to him. We did a lot of email bombs."

"We did the whole Gary and Dave branding which is on our website with an agency in Manchester in 2014, end of 2014 but yes, we are looking if Green Deal comes back and we start up to rebrand again and redo it. It will be more customer focused we want more of a blog. We need to be more with Facebook and Twitter, I think. We need to be more proactive putting industry news, news articles."

Therefore, Entrepreneur D mainly uses digital marketing methods to promote Green Deal and to explain it to customers because there are several customers that don't understand Green Deal. Also digital marketing is used to introduce Green Deal to customers where they make them aware of why it exists and what benefits it can offer.

4.6.3.6 Social Media Marketing

Entrepreneur D explains the reason why Firm D is planning to use social media: *"It's everywhere you go, Twitter, Facebook. It's very important. It definitely influences everybody every day. It is a huge market. From a company point of view, we didn't do a lot. We did Facebook."* But Entrepreneur D also acknowledges that Firm D centres on Facebook use because their business are closely to B2B marketing where most customers prefer to be reached by using traditional marketing:

“I think as we would be more B to B than to the end customer, we did more telephone marketing, ringing installers, trying to speak to them or meet them face to face. Whilst we are national, we rely on where our installer base is, so we didn't want to push it to the customers and not be able to fulfil it. We promoted it to the installers who would then find their customer base. We did a lot of more telephone marketing than we did social media marketing.”

Additionally, Entrepreneur D mentioned that Firm D would increase uses of social media marketing in the future: *“I think it's definitely an area that we will promote a lot more the next time. I think they now appreciate the importance of it ... Because we're going to own the customers and be responsible for the customers and then find the installers to carry the work out.”*

These responses identified “Social media marketing” that is used by entrepreneurs in marketing activities for TEMP model. Responses also show a growing use of social media by entrepreneurs in young ventures in the energy service industry.

4.6.3.6 Search Engine Optimisation (SEO)

The marketing team of Firm D frequently use SEO to seek new customers through analysing the web-user's (potential customer) activities. In addition, Entrepreneur D1 use SEO to measure and create additional value for the digital marketing activity, such as website browsing, and social media marketing activity, such as following the

Facebook page and asking questions about the services/products. Entrepreneur D claims that Firm D uses SEO in daily marketing action as: *“Yes, we did a lot of Google. AdWords. ... to try and get our website higher up the search on Google, we did use AdWords.”* Therefore, SEO is identified in the TEMP model.

4.6.4 MO

4.6.4.1 Market Knowledge

Market knowledge helps the entrepreneur to choose and use marketing technologies and methods for a firm’s marketing activity. Entrepreneur D explains this as follows:

“I did a degree in marketing, I’ve worked in different industries, so I’ve been able to bring the different things I’ve learned to the company, again for the company we had a marketing team, people that come with different experiences, different roles.”

Entrepreneur D explained that marketing knowledge is important to reduce the entry barriers for most ESCOs, as some entrepreneurs have limited knowledge about the energy service sector. Also, market knowledge assists Entrepreneur D to have insights into the difficulties of marketing in this sector and assist her to employ the professional marketing team. Therefore, it is of significant importance to entrepreneurs to have a sufficient ‘market knowledge’ to recognise potential risks and hazards in the marketplace and make appropriate decisions about how to deal with the unresolved issues in the market.

4.6.4.2 Networking and Partnerships

Firm D appreciates the effects of the networks and partnerships developed with other Green Deal providers to ensure all collaborated Green Deal assessors, installers and financial providers are qualified and have complete understanding of Green Deal policy. As payback in exchange, Green Deal installers and assessors explain that Green Deal correctly helps Firm D to identify more customers as potential Green Deal finance applicants.

Participants are characterised as: *“We do have partnerships with-- or we did with assessors. We have partnerships with installers; we're partnered with the Green Deal Finance company. As we're not the installer, we did build big partnerships with our installers. We went through a big on-boarding process and made sure they had all the correct accreditations. We'd invite them here for training, building relationships.”*

Entrepreneur D evaluates it as: *“All partnerships are good, yes, I don't know really. Yes, we build partnerships at work, colleagues, internal and external customers.”*

Further, Entrepreneur D discusses networking as: *“Yes. We did a lot of networking with installers, assessors, and landlord associations to build up our customer base. We would try and attend landlord meetings. We'd go obviously networking with other providers, we still network with other providers at the Green Deal Finance company meetings just to understand what other providers have been doing since and if there's any opportunities they're looking at.”*

Entrepreneur D identifies networking and partnerships as an important dimension in the TEMP model.

4.6.4.3 *WoM Marketing*

Entrepreneur D demonstrates that Firm D use WoM marketing as a critical marketing approach to identify and engage with new customers and other ESCos. Entrepreneur D explains the importance of WoM marketing as follows: *“With all our networking installers assesses especially word-of-mouth customers yes. We've had customers who have spoken to a friend or seen external wall insulation on their friend's property and then they've contacted us and they're interested.”*

The successful key of an energy service provider, such as Firm D, is to deliver appropriate services and products to meet customer's requirements and leave a satisfied impression on the customer. The customer's house that has improved energy consumption is a great demonstration to the customer's family and relevant friends and neighbours. The satisfied and professional impressions may motivate the customer to recommend Firm D to more new customers.

Similarly, Firm D also builds a firm brand as professional, friendly and helpful to the GDPs who are trained and certificated by Firm D. Firm D takes a more proactive attitude to visiting these GDPs and training them in their own offices. This provides

increased potential for introducing their business partners and competitors as new customers to Firm D.

4.6.4.4 Administrative Marketing

Entrepreneur D recalls a range of administrative marketing activities such as: “*We did do exhibitions, we used to do flyers. Obviously, we're not doing anything at the moment but we used to.*” and “*We were processing more Green Deal plans at the time that it ended. At the time, we felt the exhibition-- we'd spoken to a lot of people at the exhibition. Again, landlords, we did feel that people were positive and coming on board but obviously, then it ended, so then we couldn't really say how these things would or wouldn't have progressed really.*” Therefore, Firm D uses door-to-door canvassing, advertising flyers and exhibitions for marketing.

4.6.4.5 Direct Marketing

Defined earlier by the literature (Chapter 2, page 34), direct marketing means that young ventures sell their products/services to customers directly without any intermediary agencies. It requires that the young ventures have sufficient marketing knowledge and capabilities, employ a professional marketing team or manager. Firm D chooses to recruit their marketing team to deal with service promotion and marketing. Entrepreneur D describes this as: “*We had a marketing team, but we had redundancies in about August, September of 2015 and we haven't done marketing since then.*” It is interesting that Entrepreneur D thinks that Firm D does not have any real marketing

activities underway until a marketing team has been re-employed. The statement of Entrepreneur D also indicates the difficulty of using direct marketing in the beginning stages of young ventures.

Different from competitors who identify customers via networks, Firm D has identified new individual customers by using direct marketing method on B2C marketing. There is another situation where customer proactively contacts Firm D in advanced since promotion activities. Entrepreneur D describes this as: *“they came through the installer or they'd come directly either through the installer or directly, predominantly through the installer.... We did in some promotions but some we didn't.”*

4.6.4.7 International Marketing

International marketing may not be a top priority in the opinion of the energy service of young ventures that focus on providing services rather than product development. For example, Firm D only develops energy efficiency products to support their energy efficiency services. As Entrepreneur D claims: *“No, we create new products for the UK, improving existing products.”*

Furthermore, the entrepreneurs of Firm D have understood that Firm D does not have strong marketing competitive and higher risks and uncertainties exist in the international marketing environments. Additionally, the energy service business is highly relevant to green and sustainable energy policy that may be very different in different countries. Therefore, since Green Deal announced failure in July 2015, Firm D is now stopping to conduct marketing as: *“We had a marketing team but we had*

redundancies in about August, September of 2015 and we haven't done marketing since then.” Therefore, it indicates that Firm D focuses on the UK dominate the marketplace and has no intention to seek new opportunities and customers outside the UK.

4.6.5 Customer Needs

4.6.5.1 Customer Identification

Entrepreneur D identifies small and individual Green Deal providers as its customers through networks and works of the professional marketing team, as: *“We built big relationships with installers and assessors. We would invite them here. Obviously, it's an impressive building to come and look at. We would go and visit them. We had their staff in here to train them, we'd go to their offices and help them. With assessors, we head down to their Company who was our assessor company. That's where assessors would lodge their assessments through. Obviously, Entrepreneur D built up relationships with assessors, so they would lodge through her. She did audits, she checked their work. Building relationships were important.”*

4.6.5.2 Customer Requirements

“Customer Requirements” is important and identified in TEMP model. Entrepreneur D discusses it as: *“Obviously, if I'm a customer-- We have two alleys here because a customer might come to us and think they require a boiler and obviously, we can look at that, but the Green Deal assessment might show that they could have loft insulation as well as the boiler. We can look at other requirements that a customer might have*

and help them with those, through then a Green Deal assessment, help them with different kinds of funding. Yes, it's important to understand what the customer requires.”

By understanding the purposes of why house owners want to improve their houses, Firm D can understand the true requirements as: *“They might be of selling the house or they might want to settle their Green Deal plan or there might be a problem with the product, so I'll just try and fulfil their requirement really.”*

4.6.5.3 Customer Satisfaction

The term “Customer Satisfaction” means that the customer understands the context of services (Green Deal) provided and chooses the right product/service which Entrepreneur D understands personally as: *“To me, that's making sure the customer gets the right product, it's installed correctly, they understand the process and they're happy with the process.”* And Entrepreneur D describes its importance for young venture and how it is related to post-sale services: *“It's important that our customers are happy. Ultimately, if they're not, then we would deal with that with our complaint policy but ultimately, a happy customer might create another happy customer.”*

4.6.5.4 Customer Loyalty

Entrepreneur D understands that the impacts of dimension “customer loyalty” is very limited, despite the entrepreneur of Firm D has recognised its importance. Entrepreneur D presents it as:

“I came from within the industry and then we built up a big customer loyalty. We wanted the installers to buy our products every time. For me, I understand the importance of customer loyalty.” however, *“We don't really have repeat customers or we haven't, as of yet. Most customers have come for one product and then the Green Deal Finance ended. It's hard for them to come back to us but certainly, we would try and build our own loyalty by-- if for example, we were going to do the solar batteries, we could try and contact our existing customers and build up the loyalty but at the moment, it isn't something that we have or can offer really.”*

Therefore, customer loyalty is less important for young ventures at the early stage of firm's development. However, this dimension has been identified as relevant to the TEMP model.

4.6.6 Marketing Performance

Entrepreneur D measures the dimension “Marketing Performance” by using the target aims set up for these collaborative Green Deal providers: *“Yes, obviously every campaign we did all customer leads we reported on to understand what works and what doesn't. Marketing were targeted, on-boarding installers. Yes, we set targets and they received bonuses if they hit them.”* while Entrepreneur D provided further details:

“We reported on how many installers we'd on-boarded and then when the installer had done their first Green Deal plan, then the fifth Green Deal plan and then the tenth Green Deal plan. Because lots of installers did one plan

but they didn't do anymore. It was trying to build the installers because once they'd done”

4.6.7 External Environmental Factors

4.6.7.1 Green Energy Policy

Entrepreneur D discusses two major types of green policy, the Green Deal and ECO as follows:

“To me, obviously, since I started working for Green Deal Finance Company, I understand more about the green policies and the requirements as a nation that we have. I do feel that I am more conscious as an individual now about how we can all do our little bit. Obviously, as a company, we follow green policies closely and obviously, it's been very up and down with the governments and the funding. It's been hard as a provider.” And *“we started with ECO and then that disappeared, so then we built up Green Deal Finance and then that's gone and now, that's come back. We've still got our customers to look after and we do believe that Green Deal can work. I think we just need some support, really, for that.”* When asked further: *“No, it just shut one day. We were just on the systems and it just stopped processing. It's just not the way to do it really.”*

Evidence from Entrepreneur D's card-based interview shows that the green policy is beneficial to young ESCos and house owners who applied for Green Deal

reimbursements. However, this interview participant also complains about the sudden stopping of Green Deal support by the government. Therefore, this dimension is identified as an important component of the external environmental factors in the TEMP model.

4.6.7.2 External Environmental Uncertainty

External environmental uncertainty can be perceived in terms of several aspects, such as new law and regulatory publication, changes of market structure and changes in customer needs (Liao and Hu 2007). The findings of this thesis show that the failure of Green Deal and changes in market structure are based on changes of numbers of business opportunities and customers. Entrepreneur D observed that several ESCos shut down since the latest green energy policy, Green Deal, was announced to have failed.

The entrepreneurs in Firm D saw tremendous opportunities and potential customers in the domestic market. Entrepreneur D believed that Firm D would identify lots of new business opportunities and customers since many competitors have quit from their energy service businesses. However, other negative changes faced by Firm D come from changes of green policy as: *“Obviously, as a company, we follow green policies closely and obviously, it's been very up and down with the governments and the funding. It's been hard as a provider.”* Therefore, the card-based interview develops further understanding of ‘Environmental Uncertainty’ and demonstrates the relevance of this dimension for the TEMP model.

4.6.7.3 Venture Capital (VC) and Government Funds

Entrepreneur D believes that the development of Firm D may not need to involve with any investments from governments and private investors since Firm D is a service providing young venture. Entrepreneur D states it as: *“We didn't but then when the finance ended we have started to work together to obviously push our thoughts to the Green Deal finance and the government obviously, we've all built up companies and then the financial issues impact on everybody, we then came together to try and get it back up and running.”*

4.7 Findings of Non Green Deal Firm Interviews Using the TEMP Model

Further to corroboration of the TEMP Model in the Green Deal context, the TEMP Model is now applied in the case of two non-Green Deal companies, Firms E and F, to validate the model further and generate further interesting insights.

4.7.1 Entrepreneur's ideas and intentions

Most entrepreneurs generate their entrepreneurial ideas and intentions from the concern about the environment pollution. However, the entrepreneurs hold ideas to improve not only the environment that the entrepreneurs live in, but also the environments of the developing countries that are suffering many types of environment-pollution problems:

“The environment is a big one. Talking about air pollution and energy usage, especially looking at China at the moment and stuff, some of the stuff that's

going-- I'm (Entrepreneur E) not specific with the names, but you see all the coal power plants and all the smoke coming in some of the cities, and you think "Well, that's scary. Isn't it?"

"(Entrepreneur E) I've really looked into urbanization, third world countries like India and they're building these big cities. What if this technology being built into a city from the ground up. Me help people with their hygiene, keeping themselves clean."

The entrepreneurs access this information about climate changes and environmental issues via the newsletters subscription, discussions on network events and newspaper reports. From there, the entrepreneurs develop lots of entrepreneurial ideas and intentions; however, some ideas and intentions are beyond their abilities to achieve.

Entrepreneur E discusses one of his unachieved entrepreneurial intentions in these terms: *"Try and stop (to help Nazareth people) -- Because people have lots of problems here, we don't actually have enough energy. If we go at a shower tray, do you know Nottingham? The big coal power plant. If half the UK had one of our showers, we could get rid of the whole coal power plant."*

These unsuccessful ideas and intentions provide the entrepreneurs' experience in developing proper entrepreneurial ideas and intentions for their fledgeling businesses. Entrepreneur F describes their group meeting as: *"We have lots great proposals for the firms. In the end, I decide to do this project"*.

4.7.2 EO

4.7.2.1 Motivation

The major motivations for all entrepreneurs in the energy service industry are the development of products with unique innovative technologies. Entrepreneur E describes the major motivation as:

“I'd really struggle going to university but I looked for product design and stuff. I really enjoy that, so that triggered me to do it by myself really. That's my main motivation.”

In addition, chasing for profits is the other motivation that made these technical experts into real entrepreneurs by: *“Money. ... Actually, when you're saving people money, it frees money for people which then allows them to invest into products like this.”*

(Entrepreneur F)

Furthermore, some entrepreneur is motivated by a great goal that humans should protect their environment. It is mentioned by Entrepreneur E: *“Initially, I liked the idea of saving energy for people. That led on to help save the environment.”*

4.7.2.2 Entrepreneurial Experience

Three interview participants believe they had entrepreneurial experience and, the success of their current firms is beneficial from having entrepreneurial experience.

Entrepreneurial experience are either mastered from past work experience and entrepreneurial activities or learned from training and family education. Entrepreneur E describes the entrepreneurial experience of learning from the previous work training and entrepreneurial activity that he used to found the other electrical firm:

*“I get this (entrepreneurial) experience in training. That would be from my electrical background, because that was my first business.” ... “I [REDACTED]
[REDACTED]
[REDACTED].”*

Entrepreneur F has gained the entrepreneurial experience from the family education and past job experience:

*“I [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].”*

4.7.2.3 Work Experience

Participating entrepreneurs attest that they are used to working for another energy supplying, green energy and energy service companies to save money and collect

customer contacts for setting up their prospective firms, which could be the sources of the entrepreneurial ideas:

“I (Entrepreneur F) tip all of these customers on through my products to have in their house. At the same time, (you) probably making more money for yourself, because it's more work to do. It's almost like advising people on what to get to make their house nice.”

Entrepreneur E describes his past work experience as *“When we're talking about industrial side of my installation, I used to work for another company. ... It's a medium company. They're called ... I was brought in to help produce some of the equipment for their test. say like special airplane used engines.”*

Moreover, work experience helps the entrepreneurs to observe the energy consumption issues at first hand that trigger them into re-thinking the modes of current energy use and to identify what needs be changed:

“That's all electrical. That really opened my eyes to how much energy people are using in the home. From that, it became apparent that I was installing lots of low energy light bulbs and things like LED lights trying to saving a bit of energy. You start looking at the shower or something, and you consider how much energy that uses compared to the rest of the houses, the biggest consumption in the whole of your house. I've always thought about how to-- I'd like to recover the energy, but only came, or pair of a nice, or a heat exchanger working.”

4.7.2.4 Risk-taking

Running young ventures, the entrepreneurs face several kinds of risk that include experiment failure, lack of money, and holding different opinions from co-founders. Entrepreneur E describes these issues as: “*Just manufacture mistakes, experimentation. There's better way to do it. You got to make mistakes to learn.*”. Hence, the finding of financial risk is:

“I think it's really focused about popping money.” ... “I think the fact that you invest in the patent is a risk in itself.” ... “It's probably cost me £40,000 to get this far”. and evidence for conflict opinion is: “I keep my research work to myself because if I told them how many failures I've had, they go, "God, it's never going to work." But I'm very patient. I know what to do. It's taken me four years but I've got to where I want to be.”

In addition, risks from competitors who sell similar products on the market. Just before Entrepreneur E decided to develop the eco-tray showering product with a factory, he noticed a similar product made in Swiss has been selling on the UK market: “*There was a version which was similar with a competitor called XXX [REDACTED]*.” ... “*The recovery on the XXX [REDACTED] would be 60%.*”

However, the entrepreneurs have the solution to reduce the risk by: “*Bringing the product to market quick enough*”. The solution is taken by both Entrepreneur E and F in Firm E and F respectively. It may raise another risk that a new venture cannot produce enough products and fail to deliver them to customers on time. Entrepreneur E

concerns this problem for the Firm E: *“The risk is if we get 10,000 pre-orders, I’ve got to supply 10,000 within the timeframe stated, if you know what I mean.”*

4.7.2.5 Proactiveness

The entrepreneurs demonstrate one of their characteristics, proactivity, several times when they discuss the relationship with partnering companies *“Actually, it feels good. I’ve been dealing with them for about two years now. I think we’re (Firm E and Party B) on a-- We’re both heading in the same direction.”*

The entrepreneurs are proactively seeking business opportunities and partners: *“I’ve (Entrepreneur E) lost count how many meetings I’ve been to with different companies, and these guys seem really nice. It makes a nice change.”*

The entrepreneurs spend most of their time on product development and continue to add further innovative technologies into the products because they are technology-oriented entrepreneurs: *“It (product development) seems pretty non-stop.”*

Furthermore, this personal characteristic is demonstrated when entrepreneur E identified a similar product from an international competitor:

“We have searched the product picture on the web. It turned out that they’ve since taken their product off the market because it was £2,000 and it was only recovering half of what my product is.” ... “I don’t think it will be a problem in the UK market.”

4.7.3 TO

4.7.3.1 Innovativeness

Both Entrepreneur E and F acknowledge that they use the innovativeness approach into the NPD and product innovation; however, none of them described this further. One possible explanation is that the entrepreneurs think that innovation and innovativeness as a continuing process and, they try to avoid discussing any of them to hold the business secrets. Furthermore, Entrepreneur F demonstrates his confidences and optimism that the innovative knowledge and technology used in the products would distinguish the products from other usual products in the market. Products of the case firms have innovative technologies, or as Entrepreneur E defines the innovation: *“It is the most efficient shower heat exchanger, with no losses.”* While Entrepreneur F also describes it as: *“It is the world’s first all-in-one solar generator. Only like this big”*.

In addition, the entrepreneurs have the innovative understandings on product, Entrepreneur E states:

“Use a simple design. It looks simple. But there’s a lot of maths gone behind it to make it work. But if you look the whole up, it’s really simple. Because it looks really simple. But the processes that have gone into it, everything, they are complicated”.

4.7.3.2 Technology Adoption in Decision-Making

Entrepreneur E has introduced several data collecting methods based on social media and search engines for decision-making. Entrepreneur E has identified and joined in the same LinkedIn and Google+ networks and, traced product development and marketing activities from the competitor. In addition, Entrepreneur E uses Google to access the competitors' websites and Facebook pages to learn about the marketing methods used by competitors. These actions allow Entrepreneur E to have insights into the status of Firm E and its competitors for decision making support. However, Entrepreneur E does not recognise these actions related to his decision-making. Entrepreneur E said: *“No, ...no... I don't think I use any of it.”*

Entrepreneur F also explained that they decided to enter the Canadian and African international markets based on information found on the digital marketing channels, social media and search engines. Entrepreneur F states it as: *“We did lots of survey about it. We don't know which country need the solar generator. So Entrepreneur F2 and I did a lot of research about it on the Internet.”*

4.7.3.3 Technology Superiority

Entrepreneur E and F share a lot of information about how the products are unique and distinct from the others. The Term “Technology Superiority” refers to the most important innovative technologies to the entrepreneurs in the energy service industry. Technology superiority is the key dimension that allows entrepreneurs to advertise advanced productive technologies in various marketing methods.

Entrepreneur E states the technological superiority of the eco-tray showering product as: “*We embed the heat exchange technology into the product*” and later he supplements: “*Imagine it comes out the shower head, goes on you, it loses temperature all the way down. It goes over the shower tray, gets colder, then goes on the plug hole, and by the time it’s got to the heat exchanger, it’s lost about 12 degrees. You degraded that by a third straight away.*” And “It’s a lossless technology. ... half the size, but double the performance of the nearest competitor. The actual physical size is half the size.”

4.7.3.4 New Product Development

The entrepreneurs described differently how to develop the new generation of the product by emphasising product advantages differently. The entrepreneur of Firm E emphasises the quality: “The products got to be reliable because if it's not easy to install, no one's going to want to install it.” Meanwhile, Entrepreneur F focuses on the all-in-one design and mobilisation and describes the new product would be:

“We (Firm F) has developed the world’s first all-in-one solar generator that is modular, mobile, and tracks the sun. This means that even the most remote locations can now access cost-effective and low-risk solar power. ... The mobility of the generator also mitigates risks and makes our generator significantly easier to finance than permanent installations.”

Apart from confirming the opinion of the other participating entrepreneurs, Entrepreneur F also discusses the relationship between new product develop and marketing technology as:

“New product development, I guess there’s a couple of aspects to this. It’s the technology aspect. It’s also understanding the market of which that technology will penetrate. Development is sort of the mix of the two. It’s understanding what the problem that you’re addressing, understanding how to solve it, making sure that product does solve it, and then testing to see if the market that you’re going to enter really needs that. That is I guess the essence of new product development. That is essentially what we are doing as a business at the moment.”

4.7.3.5 Digital Marketing

Digital marketing refers to the website and Facebook page to the entrepreneurial participants in the semi-structured interviews since they are the most commonly and frequently digital methods used. Browsing the competitors’ websites, the entrepreneurs enable collecting data about their products, sales figures and other aspects of a firm profile. Entrepreneur E describes the function of the website as:

“I’ve got some data on competitors and how many they sell weekly in an area. Apart from that, we can sort of gauge our performance ... They actually say how many they sell in a week on their actual website, on their company info.”

Using the website, the entrepreneurs provide great first-impression information about products and increase trading activities with the B2B customers via both direct and indirect marketing. Entrepreneur E states the evidence as: “That’s going to be through direct marketing which in turn will be like an indirect marketing to the people having a shower in the hotel. They will get to see the first viewing of our commercial products

on the website before we sell it to consumer directly.” And then: *“I’ve got some data on competitors and how many they sell weekly in an area. Apart from that, we can sort of gauge our performance”*

The data collected from other firms’ websites assists the entrepreneurs to develop criteria for marketing performance measurement, increasing marketing intelligence and confidence to investors. Entrepreneur F describes this during the interview as: *“Make benchmarks. Say, this is what you want to get to, this is what is achievable. That’s been quite useful by talking to investors, in saying how many you sold in the UK.”*

4.7.3.6 Search Engine Optimisation (SEO)

The entrepreneurs use social media as a data collection tool to understand the market and competitor. Entrepreneur E states that *“I don't like giving out all these bits of papers all the time to people. The first thing I want to do is google. Google it. I was getting to the point where the website was looking very good, I've got some nice new vendors but don't know how to get a website.”* And then *“From the internet, from the company’s homepage. They quite openly disclose how many they sell in a week.”*

Entrepreneur F explains the use of SEO as: *“You can make some assumptions because I think people actually don’t know how much it costs to have buy solar panel and where they should go. It's better to inform them who you are and where they can find your company website. It's changed for about five times in the past year. They keep on*

changing it because – ranking is something important to our business.” The findings show further understanding of how entrepreneurs use search engines beyond advertising. By ranking the firm website at the top-three pages on Google, young ventures have lots of opportunities and successful rates to identify new customers. Furthermore, customers can find the young ventures using search the other way around.

4.7.3.7 e-WoM marketing

e-WoM marketing helps Firm F to enter the international marketing of Canadian and African since e-WoM marketing helps the firm to break through the limits of geographic location and time difference to give new international customers more confidences by reviewing the digital referrals on the website and Facebook pages. Entrepreneur F remembered that : *“It’s incredibly relevant, because this (Canadian) market that we are going into is brand new.”*

Additionally, e-WoM marketing can repeat the use of previous users’ testimony, photos with big smile and a touchable story to refer either to the previous customer’s friends or to strangers. Therefore, Entrepreneur E believes e-WoM marketing has a more positive impact on marketing performance. Entrepreneur E states that *“Probably not just through friends. Exposure through the Firm E’s website and twitter, many people talking about it, which is quite nice. Yes, that’s what I do, really.”*

4.7.4 MO

4.7.4.1 Market Knowledge

The entrepreneurs interviewed think themselves to have little knowledge about marketing or a “*Very limited amount.*” (Entrepreneur E). However, they demonstrate knowledge about the market and target customer. Entrepreneur E describes as:

“I was in discussions with the luxury shower manufacturer in the UK. Their average price for a shower (of Firm E) is about £80. An average price of the luxury shower company is about £700-£800. It's a different market.”

While the entrepreneur of Firm F states: “*The downside with that is that they've got quite a limited market. They only sell expensive stuff. They don't really do the cheap stuff.*”

4.7.4.2 Networking and Partnership

Entrepreneurs use a combination of the personal contact networks (PCN) and business networks to leverage the lack of human resources. The entrepreneur of Firm E provides an example:

“One of the stakeholders is my uncle. He's assisted with all the CAD drawings because I don't have any CAD skills-- computer drawings.... He's assisted with all the website developing things.”

Networks are initially identified from the business incubators that the case firms have already settled in. Joined in these initial networks, case firms are able to seek out cooperating opportunities with large energy supplying and manufacturing companies who are in the same networks. Furthermore, staying in the same networks gives case firms further confidence and increases their success rate when engaging with large companies. From there, the case firms can share the first customer lists, markets, resources and product technologies by engaging with large companies. Entrepreneur E describes the importance of networks:

“
[REDACTED]
[REDACTED]. They allow me to have introductions to larger companies I wouldn't normally have access to along that, because it's an introduction from a reputable source. They would take me more seriously when I had the introduction.”


Moreover, case firms establish further relationships with local authority to seek more business opportunities via attending events organised by networks. For Entrepreneur F describes this as: “*This is through my networking events, I've managed to talk to people that represent their county councils.*”

Participating firms tend to choose large manufacturing companies as their business partners to access large companies' existing customer contacts and marketplaces. Entrepreneur F chooses the large international company to reduce the barriers of entry the international market:

“It’s a big company. Employs 500 people. They are currently just out in the UK, but they are looking to expand their markets. They’ve been looking to selling to Europe and America.”

Entrepreneur E’s explanation is:

“This is quite confidential, this bit. We are in discussions but, maybe, say, Licensing Party A, something like that. ... Licensing Party A will give me access to wholesalers and distributors.”



The young entrepreneur trend is to develop a close relationship with local universities, as Entrepreneur E states: *“We (Firm E and Party B) met through Country University. Through a networking.”*

Furthermore, partnership means a collaboration with competitor. The entrepreneur of Firm E describes the relationship between Firm E and its major competitors, Party A, as: *“They (Party A) would be selling bathroom products into the UK. Bathroom product, I mean, eco-showering system as well.”* When Entrepreneur E has been asked to describe the relationship with Party A, the response is:

“That's an interesting one. [laughs] We're going through some of the contracts at the moment. I had a meeting last week giving them some ideas, but I think they're looking at licensing the products office.”

Furthermore, Entrepreneur F claims that: *“It's been proposed to me that I (Entrepreneur F) project manage the gauge ray. It's proposed that I project manage and I use their (an African firm) resources.”*

4.7.4.3 WoM Marketing

The entrepreneurs interviewed all emphasise the importance of the Buzz marketing approach because it is the main model of marketing to identify customer and increase marketing performance: *“Very relevant. In our business (Firm E), it's probably the most important thing.”* While Entrepreneur F agrees that Buzz marketing is the essence of the marketing activities for Firm F:

“Reputation that people will talk about. It's very important. In the solar industry, the industry itself is information is nature. It's difficult to get information out to the end-user. If you can establish a good rapport with the people in the industry that matter, you will get a lot of business. That is generally done by word of mouth. So that is why as a plan, you strategically aligned with investors that we'd know can help us provide that word of mouth.”

Buzz marketing is important because it can increase customer satisfaction. As a consequence of that, the existing customer will introduce further potential customers and business opportunities to the case study firms. Entrepreneur F presents that:

“As a company, we can advertise ourselves. Now, most of the successful type of advertising is advertising other people, and they do it for you. That can come by our customer to a customer that is satisfied, who can tell the people. They can tell by designing your product, the technical people we talk about, that word of mouth. It can come about having a good reputation with big organizations.”

The entrepreneurs are required to seek ‘important people’ to introducing the quality and feature of products since their great person reputation give more confidences to other potential customers. Entrepreneur F describes buzz marketing as: *“Important people who have like money, and the ability to spread what we are doing via word of mouth. These people are very successful at their own work that have good reputation themselves.”*

4.7.4.4 Administrating Marketing

Conferences and exhibitions are used as the most frequent administrative marketing approach by case firms; Entrepreneur F explains that the reason for this is:

“I talked to people who were doing new build elements in around the UK that are looking to include energy-efficient products because there are lots of seminars about energy efficiency and stuff, so a very big audience of people that would come there who would all be interested in energy so it's a really nice way of getting pointed to that.”

Different entrepreneurs seem to have different understandings about traditional marketing method, while some entrepreneurs consider firms' websites are the traditional marketing channel. Entrepreneur F defines the administrative marketing approach of Firm F: *“The traditional marketing would obviously would be advertising your website, like putting in advertisements out in the paper, putting up billboard, advertising in conferences, making paraphernalia's and t-shirts, and pens. I guess, even now, they (the employees of Firm F) say that web advertising is traditional advertising. Advertising on Facebook or Google, and they say that's traditional marketing.”*

4.7.4.5 Direct Marketing

The entrepreneurs agree the existing of their direct marketing activities via networking or collaborating with large business partners. Firm E is reported to carry out the direct marketing via a B2B partner [REDACTED]: *“So I've got a business to business customer at the moment, then they would sell direct to the customers after.”* While Entrepreneur F believes that: *“Marketing itself is generally*

done by a direct contact. Just because we're such a new company and we are trying to be unnoticed because the industry dynamics now in the uncertainty environment."

4.7.4.7 International Marketing

As Entrepreneur F describes it: "Because the industry itself is logistically diverse. You'll buy panels from China, inverters from Germany, wiring from Africa, and take it to site in India, in Australia. Now it's much easier to bring them to site and put at site, than it is to do it somewhere else and put in site. However, the supply chains have matured, and it is now at the point where it is cost effective to put together on site. To put together in a factory."

Networks help the entrepreneurs to identify and engage with opportunities that exist on the international market. Entrepreneurs E knows one of the main technical experts who come from Germany via the network event organised by Climate-KIC as: "*I'm (Entrepreneur E) using our existing contacts through people I've met there. ... XXX was in a different part of the Germany at that moment. He is a pretty valuable friend.*"

4.7.5 Customer Needs

4.7.5.1 Customer Identification

The entrepreneurs are seeking potential customers not only on the external market but also inside employees and suppliers. Entrepreneur E has identified the green product

installers as a kind of the potential customer for Firm E: *“Just to point. There's the needs of the customer. It's got to look nice. It's got to work. Then, there's the needs of the installer as well, which would be me.”*

The entrepreneurs have marketing senses that distinguish their target customers from others to increase the success rate of marketing actions. Entrepreneur F describes how Firm F seeks prospective customers as: *“The entire customers we're selling to are very unfamiliar with their technology and their power is of extreme importance to them.”*

4.7.5.2 Customer Requirements

Interaction with customer in both past and present careers allows the entrepreneurs to have insights into customer requirements. Entrepreneur E describes: *“It's allowed me to have a good thorough understanding of how this is put together on customer's needs.”*

It is important to understand the customer requirements since *“It can help you design a product to suit customers. I mean like this is like totally different customers. In the route that we're going down now with the licensing party is to produce a bespoke product for a customer and the idea is--and then they--so they sell thousands a week of their product and me being incorporated in to that; the concept design.”* (Entrepreneur E)

However, customer requirement is not always identified straightforwardly, it can also be identified from the firms' employees who implement energy saving and sustainable products: *"I (Entrepreneur E) can determine the needs of the installer as well."*

4.7.5.3 Customer Satisfaction

Entrepreneur E and F demonstrated that the dimension 'Customer Satisfaction' is important. Entrepreneur E used the customer satisfaction survey to improve the development of new products: *"It's a good question. We do like a customer review satisfaction survey, or thoughts about the product."* Moreover, *"We're working directly with them so we'll have feedback during it the design process. Feedback during the installation process then we get feedback from them during the usage of the product, as well."*

As Entrepreneur F evaluated this dimension as: *"you've got a quality installed product, potentially. Customer really care about it."* And *"It's very important for the business if something goes wrong with their power, so having satisfaction with our product is probably the most important thing in the business. Having acceptance."*

4.7.5.4 Customer Loyalty

Entrepreneur E has realised the importance of customer loyalty as *"I would say very much so. I would say customer loyalty is very important"*. This opinion is echoed by Entrepreneur F as: *"In that sense customer loyalty is important, but probably not as*

important as say if you're selling toilet paper to someone because over your life that loyalty matters much more."

4.7.6 Marketing Performance

Entrepreneur E uses the number of selling/ pre-ordering to calculate the firm's marketing performance: *"I'd have to get 10,000 pre-orders."* However, the financial achievement is the ultimate method to count on the firm's performance by: *"That's a million pounds' worth of pre-orders"*.

The interviewed entrepreneurs treat the changes of marketing performance as a critical sign for firm development, while Entrepreneur E describes this as: *"I think that's given me the direction to get expansion of the company. It's feasible."*

4.7.7 External Environmental Factors

4.7.7.1 Green Policy

Despite the fact that these entrepreneurs are not familiar with the green energy policy, such as Green Deal and ECO, in order to developments Firm E and F these entrepreneurs are required to have knowledge about another energy and sustainable policies and schemes available in the industry. These policies and schemes include the CRC Energy Efficiency Scheme, Climate Change Agreement (CCA) funds and the EU Emissions Trading System (EU ETS).

4.7.7.2 Environment Uncertainty

Most entrepreneurs recognise the uncertainty in the external environment as a kind of opportunity for the business development, owing to increasing customer requirement because when the customer realises the changes happened in the environment. They stay in:

“It should make the business grow, if anything, I’d say” ... “Because people will start recognizing the problems and that they need to do something about it, and if energy prices continue to rise, I say, it becomes a lot of money. Even a few percent can cost up to £350 a year per person.”

4.7.7.3 VC and Government Funds

Financial investment is a critical dimension when deciding the success of a new venture. Therefore, the entrepreneurs trend to apply the funds from the European Union climate change project or, seeking a private money investment from the Venture Capital origination, bank or individual investor. In some circumstances, the individual entrepreneur does not always make the decision of financial investment as it is a group decision made by the entrepreneur and partners together. Entrepreneur E describes this as:

“They’ve got the same interest now, but because I’m a small company, it’s much easier to get grants and things because they’re too big to actually receive some of the grant funds.”

Furthermore, the term ‘investment’ is equivalent to ‘partnership’. The entrepreneur of Firm E explains:

“Em... partnership means investment from the firm view ... Because currently, I couldn’t invest the money needed for patents and things like that, sales support, the patents, and the product development.”

Furthermore, the entrepreneurs use the fund applications as opportunities to check their firms’ marketing activities: *“It is good because they let you know what was wrong with it and then we can amend that, put actual information where it is weak.”* (Entrepreneur E).

Getting investment is critical because: *“It also de-risks it as well.”* (Entrepreneur E) and *“Instead of putting two and a half million pounds in, you only have to put half a million pounds in. You can buy a factory with that so you still enter with an asset. At the end of it even if the company went to shut down, you still have a factory with machines. You still own your percent share. It’s tough to bring down the research and development costs and the initial setup costs.”* (Entrepreneur F).

4.7.8 Discussion of the Findings from Non-Green Deal Firm Interviews

In this chapter’s discussion of the semi-structured interviews’ findings, the entrepreneurs develop the “entrepreneurial ideas and intentions” that derive from increasing concerns about climate changes, air pollution and other environmental issues.

Most entrepreneurs not only focus on energy wastage inside the UK, but also concern themselves with environmental pollution in developing countries, such as China, India and Nazareth. The entrepreneurial idea is developed based on the newspaper reports and network presentation topics, while information about climate change and environmental issues is recognised as the source of all entrepreneurial activities for entrepreneurs in the UK energy service industry. Furthermore, the development of successful entrepreneurial idea and intention is the outcome after lots of unimplemented ideas. In terms of the nature of entrepreneurial spirits, such as proactiveness and persistence, the entrepreneurs tend to continue to develop and examine entrepreneurial ideas until they work.

In EO, six dimensions are emanating from the case study interviews: motivation, entrepreneurial experience, work experience, risk-taking, proactiveness and entrepreneurial resources. Firstly, research findings identify three major motivations product development, earning profits and environment improvement, for setting up new venture in the energy service industry. Product development is a manufacturing process that transforms an entrepreneurial idea with innovative productive technology into the product entity. Making profit is the essence of any business, so it is easy to understand as a business motivation. The third motivation that concerns environmental changes links the entrepreneurial idea and intention to the founder's entrepreneurial spirits.

The second and third dimensions discuss two types of experience for business and the two types of experience intertwined. Entrepreneurial experience can gain either from training in previous work experience or family education by parents' work experience.

Entrepreneurial experience helps the entrepreneurs of UK ESCOs to familiar with the entrepreneurial procedure. Furthermore, work experience helps the entrepreneur to open minds by accessing innovative technologies that are used in other large companies or industries, identify energy consumption issues and opportunities by communicating with customers in previous work.

The following dimensions of EO, next, demonstrate two entrepreneurial characteristics: risk-taking and proactiveness. The entrepreneurs have identified several internal and external risks during the running of new energy efficient firms. Internal risks include high failure rate and cost of product experiment and development, along with the ability to produce and deliver the quantity of products on time. Risks outside the firm mainly come from competitors and competing products. The other entrepreneurial characteristic, proactiveness, allows the entrepreneurs to continue to seek information about product and market, new business opportunity and identify existing and potential competitors. Finally, entrepreneurial resources are the resources that entrepreneur can use to help firms' survive or grow. It includes the material resources as money, material and equipment and intangible resources like information and research and developing capacity.

The findings of TO show dimensions that include innovativeness, technology superiority, new product development, digital marketing, administrative marketing and SEO. However, there is less evidence that supports the dimension 'Technology adoption in decision-making'. The reason is possible that the case study firms are still in their early stage for business, the decisions that made in this stage are simple and

direct. Therefore, it is not need the support of any technology. To the entrepreneurs, the term 'technology superiority' discusses the innovative technology embedded in the product similar to the context of term 'innovativeness'.

Here, innovation does not always mean a brand-new technology has just be created; it also refers to a combination of different manufacturing technologies that may be used in the products of other large companies or industries. For example, the entrepreneur of Firm B learned and used inversely the heat radiating technology of the airplane engine from the Mercedes to develop the new eco-tray showering system. Therefore, new product development does not need to be started from scratch. Saving-investment on the productive technologies, the entrepreneurs spend more energy and focus on the quality of product and relationship between new product development and marketing technology use. This provides evidence that TO should include both productive technology and marketing technology.

In addition, the TO findings indicate the use of marketing technology centring on commercial intelligence. From the interview findings, digital marketing that describes the understanding of the website and Facebook uses. The entrepreneurs provide further functions that collect the marketing data of the competitors, learning and updating market knowledge for both the website and Facebook. Collaborating with SEO, the website and Facebook guide the entrepreneurs to increase knowledge of the market, their customers and competitors.

Beginning with a discussion of market intelligence, MO shows that entrepreneurs may underestimate how much market knowledge they have mastered. The entrepreneurs participating in semi-structured interviews acknowledge that they do not have enough knowledge of the market, firm's marketing and lack an understanding of what happens on the market. However, entrepreneurs have demonstrated lots of marketing knowledge and unique understanding of the energy service industry, competition in the marketplace and customer requirement identification. Furthermore, entrepreneurs have learned how important and useful it is to join in networks for business. The entrepreneurs of UK energy young ventures tend to combine their personal contact networks and external networks to reduce the barrier of market entry, identify talent employee, and gain marketing knowledge and consultation support.

The initial networks joined by entrepreneurs are the networks organised by business incubators or local universities, while the network events provide several opportunities for the entrepreneur to establish partnership with large companies, access customer contacts of the networks and acquire large business partners. Moreover, connecting with different networks, the entrepreneurs identify customer and competitors rapidly and develop the ability to transfer the relationship of competition to collaboration between the firms and their competitors.

Apart from the findings of the web-based marketing technologies, the semi-structured interviews also collect evidence of further marketing approaches, including buzz marketing, administrating marketing, direct marketing, guerrilla marketing and international marketing. The case firms have used buzz marketing, also recognised as

Word-of-Mouth marketing, as the most critical marketing approach for identifying new customers and purchasing products. The entrepreneurs learned that the success of new ventures' marketing activities relies on the identification of 'important people' who can guide or give influences on other consumers' purchasing behaviour. These 'important people' are also known as the opinion leaders (Gladwell, 2006).

Conferences and exhibitions are two generally used as the most frequently administrative marketing approach by case firms. Different entrepreneurs seem to have different understandings about a traditional marketing method, while some entrepreneurs consider firms' websites as a traditional marketing channel. Furthermore, another interesting finding is that the entrepreneurs prefer selling products on the international market, but none of them is planning to sell products globally. One possible reason is a restriction of the size of the firm in question.

In discussing customer needs, the entrepreneurs are seeking potential customers not only on the external market but from inside employees and suppliers. They have marketing senses that distinguish their target customers from others to increase the success rate of marketing actions. Interaction with customers in both past and present careers allows entrepreneurs to gain insights into customer requirement. However, customer requirement does not always identify customers straightforwardly; it also can be identified from the firms' employees who implement energy saving and sustainable products. Furtherly, the entrepreneurs all agree that customer satisfaction is very important to facilitate the firm's marketing performance.

The entrepreneurs measure the firms' marketing performance by counting the number of product that is sold and pre-ordered. Marketing performance is also evaluated by how many products are sold by competitors.

Finally, research findings also show the effects of external environmental factors from three perspectives: green energy policy, environmental uncertainty and VC investment and government fund application. Compared with other energy service firms, the green energy service based young ventures are beneficial to the financial aids and business opportunities provided by authorities. However, the development of young venture is restricted by the policy regulatory; for example, the ESCOs are permitted to develop the products provided by the Green Deal scheme.

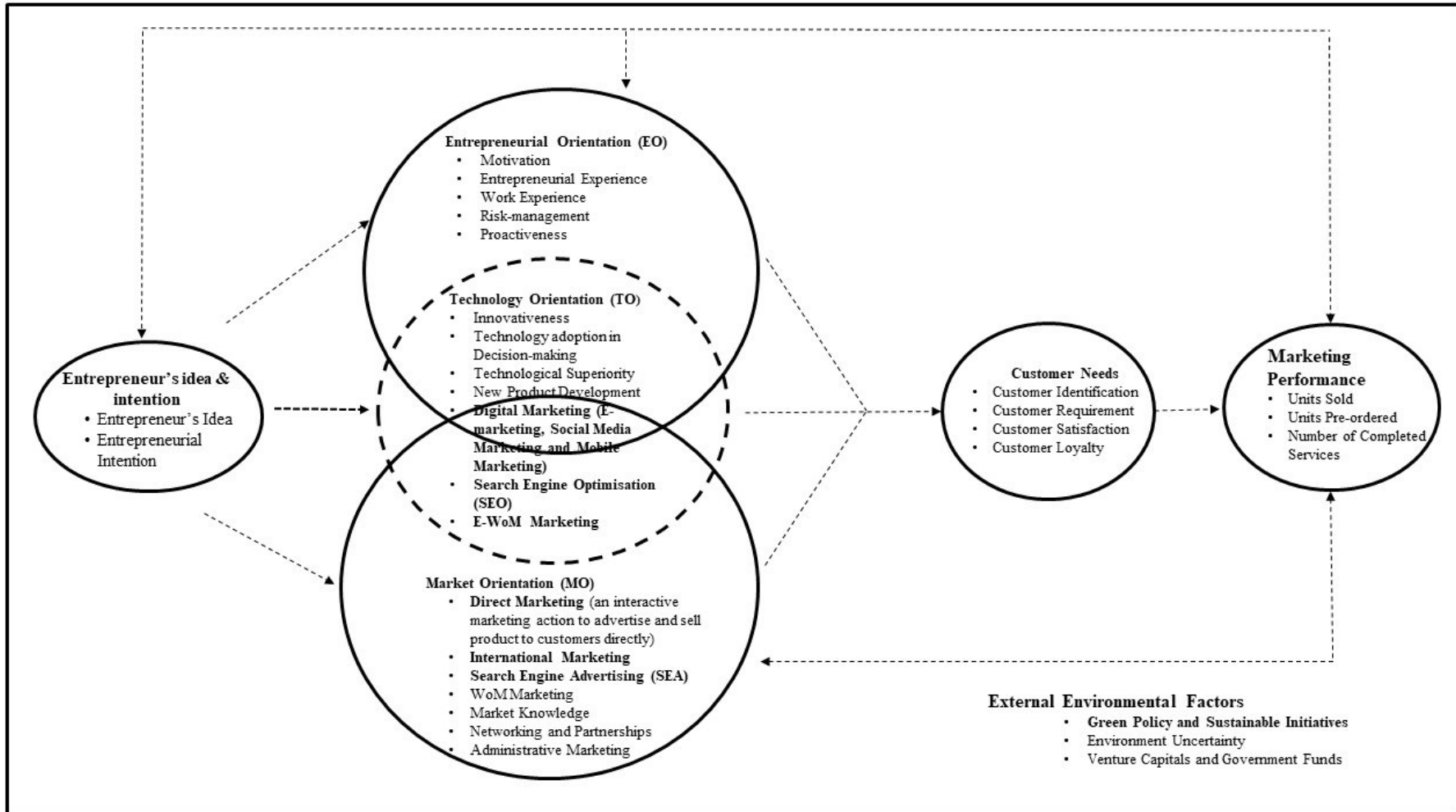
Most entrepreneurs recognise the uncertainty in external environments as a kind of opportunity for business development because there are increasingly new customer requirements, when the customer has new changes happened in this market environment. Financial investment is also a critical aspect when deciding the success of a new venture; therefore, the entrepreneurs tend to apply the funds from the European Union climate change project or seek private money investment from the Venture Capitalist, bank or individual investor. The decision of financial investment is not always be made by the entrepreneur individual while, in some circumstance, it is a group decision made together by the entrepreneur and partners.

4.8 Development of the Revised TEMP Model

This section describes how the TEMP model has been developed in stages (Appendix J) and discusses the final version of TEMP model developed with both literature evidence and all the research findings from this chapter, including secondary data and interview transcripts analysis. Appendix J illustrates the development of the TEMP. All proposed dimensions from literature have been demonstrated with secondary data collected from online non-participant observations and some interviews. Dimensions with mark (X O) means that these dimensions are identified in both previous literature and findings, while dimensions with single mark (X) means the dimensions supported with literature evidence and, dimensions with mark (O) means emerging theme identified from findings. Since there are some dimensions marked (X) where secondary data collected online is not sufficient to substantiate the theoretical dimension, further research involved semi-structured interviews with case firms was used to further investigate all the dimensions, including those dimensions with mark (X). Primary data collected from the semi-structured interviews demonstrates a different understanding and interpretation of the dimensions with the mark (X) as the entrepreneur's viewpoint is used to describe the dimension term.

The final TEMP model (Figure 4.1) includes all the dimensions which are now demonstrated both by both literature evidence and primary and secondary data collection. Therefore, this section will now discuss the development process of the TEMP model with the literature and finding evidence, in steps, to validate the model.

Figure 4.1 Final Model: TEMP model



Several emergent dimensions were also identified (Appendix J). These include content marketing (Firm C), international marketing (Firm B, C and F) and search engine advertising (SEA; Firm C and D). To understand the relationship between EO, TO and performance and reflect the activities subsumed under the dimensions of the TEMP model, an online non-participant observation of the web-based observation data was carried out amongst the sample of 34 ESCos. The benefit of this is to bridge the understanding between an academic knowledge of TO and EM and what occurs in practice. To understanding the occurrence of activities in each firm amongst the sample, the prevalence is expressed in percentage form of relating to the whole sample of 34 ESCos. A summary of study highlights is now provided:

Entrepreneurial Orientation- It was identified that the most prevalent themes of EO were Work Experience with 85.3%, Motivation with 50% and Entrepreneurial Experience with 20.6%. The identification of entrepreneur's idea and intention was low in prevalence (41.2%) amongst the web-based data and has not been mentioned during the interviews. In contrast, the entrepreneur's intention has a greater prevalence amongst the ESCo sample's web-based data with 66.7% and two out of the three key participating interviews.

Technology Orientation- Amongst the ESCos within the sample, the most prevalent subthemes reflecting TO amid the web-based observation data were Digital Marketing with 76.5%, New Product Development with 55.9% and Innovativeness with 29.4%. Amongst the three key participant interviews, the analysis revealed that one key participant was identified as presenting all three of these prevalent subthemes, whereas the remaining two key participant interviews only showed Digital Marketing (and not New Product Development and Innovativeness). Key participants aided in the identification of these TO subthemes by highlighting, in particular, Search Engine Optimisation (SEO).

Market Orientation- Interestingly, the most prevalent subthemes representing MO were Administrative Marketing with 61.8%, networking with 29.4%, Partnerships with 23.5% and Market Intelligence with 20.6%. Emergent themes were also identified amongst the web-based observation data and included Direct Marketing, Guerrilla Marketing, International Marketing and Buzz Marketing.

Customer Needs- Somewhat surprisingly, customer needs rated very low being prevalent in both interviews and web-based data. Although two of the three interviews and 47.1% of ESCOs presented web-based data reflecting customer identification, the prevalence of customer satisfaction is low, with 23.5% of ESCOs and none of the interviews presented this subdimension.

Environmental Factors- and green policy was prevalent in websites (85.3%) and identified by 2 out of 3 interviews. Most ESCOs attempted to demonstrate their understanding of the green policy and the way to transform green policies into energy efficient solutions. Environmental uncertainty was lower in both data sets while venture capital investments and government funds were prevalent in all three interviews but less visible on websites at 41.2% of the ESCOs. The TEMP model supported with secondary data findings (Appendix J) develops a foundational and guides the development of semi-structured interview question list for further demonstration.

Next, this following section presents a discussion based on the findings of Green Deal Firm semi-structured interview and finally demonstrates how the findings identify the construction of TEMP (Figure 4.1).

Discussion of Green Deal involved semi-structured interviews which suggested that the “entrepreneur’s idea and intention” primarily means entrepreneur’s pre-judgement of the energy service industry. Entrepreneur D recognises the energy service industry is a valuable industry which presents lots of new business opportunities. Furthermore, “entrepreneurial idea and intention” are created from the entrepreneur’s personal needs for home energy efficiency. Since entrepreneurs have the same needs to improve the energy consumption for their own houses, entrepreneurs could learn and acquire knowledge and access a wide range of ESCos during the period of house improvement. Consequently, entrepreneurs may create entrepreneurial ideas and intentions when they interact with these energy service providers and, then setting up their ESCos to help more house owners like themselves.

Interview responses concerning EO identify five dimensions that emanate from the case study interviews: motivation, entrepreneurial experience, work experience, risk-taking and proactiveness in the TEMP model. Interview responses show major motivations concern environment protection, making profits and using new energy efficiency products and ideas (services) to meet customer requirements. Entrepreneur D believes they are new entrants who know very little about this industry, therefore pursuing knowledge about the energy service industry is identified as the motivation for this Green Deal case firm.

Next, “entrepreneurial experience” is identified to help young ventures to explore new opportunity and create new business. Entrepreneur D acknowledged the entrepreneurial experience learned with the other founder-owner, Entrepreneur D1, to be beneficial to the development of Firm D. therefore, entrepreneurs who used to work together tend to set up entrepreneurial firm together. Past work experience is varied and do not have to relate to the

energy service business. Moreover, entrepreneurs use contacts and knowledge learned from previous jobs to develop their firm. Subsequently, two relevant entrepreneurial characteristics, risk-taking and proactiveness are identified. Risk-taking centres on changes of green policy as well as changes in markets and customer requirements. Finally, the “proactiveness” dimension enables entrepreneurs and firm employees to seek further customers and Green Deal partners via administrative marketing methods, such as exhibitions and networks. Furthermore, it encourages entrepreneur to use innovative marketing technology, such as social media.

In relation to TO, findings from the Green Deal semi-structured interview shows innovativeness and innovation procedure differ from service-centred young ventures compared to product-driven ones. Energy product driven firms emphasise the level of innovativeness in new product development at the early stages of the young venture, while service-centred firms define innovativeness as the entrepreneur’s willingness to continue optimising service procedures regarding relevant green policy. The service-centred young venture will bring in innovative technology later. ‘Technology Adoption in Decision-making’ means using simple big data software, such as Excel, to help the entrepreneur make decisions. Furthermore, it means using SEO focuses at Google and its banner advertisement function, AdWords to help customers to identify young ventures’ websites and other digital marketing channels.

Interview responses identify ‘technology superiority’ as a major method to transform the entrepreneur’s idea into product/services under the assistance of unique technologies. TO findings show the use of a wide range of digital marketing methods, including use of Email, company website and CRM software. In addition, the interview findings show uses of two major social media marketing tools: Facebook and LinkedIn pages. Finally, the entrepreneurs

give further functions that collect marketing data of the competitors, learning and updating market knowledge for both LinkedIn networks and Facebook.

MO and specifically, market intelligence/knowledge refer to different levels of market knowledge collected and mastered by entrepreneurs. Therefore, the dimension has been named as 'market knowledge' for the final version of TEMP model. They help the entrepreneur to choose and use marketing technologies and methods for a young venture's marketing activity. Entrepreneur D demonstrates that entrepreneurs may underestimate how much market knowledge they have mastered. Entrepreneur D combines their PCNs and external networks to reduce the barrier of market entry, identify talent employee, and gain marketing knowledge and consultation support. The initial networks joined by Firm D are the networks that organised by business incubators or local universities and, the network events provide several opportunities to establish partnership with large companies, access customer contacts of the networks and large business partners for the entrepreneurs.

Next, eWoM marketing and Word-of-Mouth marketing have been used as the most critical marketing approach to identify new customer and purchase products for the green deal case firms. The entrepreneurs learned that the success of new ventures' marketing activities relies on the identification of 'important customer' who can guide or give influences on other consumers' purchasing behaviour. Conferences and exhibitions are two general administrative methods used as the most common administrative marketing approach by case firms.

In the discussion of customer needs, entrepreneurs are seeking potential customers not only on the external market but also from the inside employees and suppliers. They have marketing

senses that distinguish their target customers from others to increase the success rate of marketing actions. Interaction with customers in both past and present careers allows entrepreneurs to have insights into customer requirements. However, customer requirements are not always identified by customers themselves, they can also be identified from the firms' employees who implement energy saving and sustainable products. Furthermore, the entrepreneurs all agree that customer satisfaction is significant to facilitate the firm's marketing performance.

Entrepreneur D measured the firms' marketing performance from the sample by setting up monthly service target for its collaboration with Green Deal product providers and installers. Marketing performance is also evaluated by how many products are sold by competitors.

Finally, the findings of green policy discuss several benefits that may be beneficial to young ventures of UK ESCos. However, changes of green policy happen so quickly that entrepreneurs should manage it as an affordable loss since entrepreneur D recognises green policy as the major source of risks. Next, environment uncertainty means threat and opportunities in terms of business development because changes in customer needs could decrease opportunities but also identify further customers. Financial investment is a critical dimension, which decides the success of a new venture; therefore, entrepreneur D tends to apply the funds from the European Union climate change project or seeks a private money investment from the Venture Capital origination, bank or individual investor.

Figure 4.2 shows the descriptors of the dimensions of TEMP model which are developed from previous literature of EM and wider extensive literature and also research findings of the online secondary data and interview transcripts. The development of these underpinning descriptors followed the same research logic and development process used by Jones and Rowley (2009b). The researcher revisited the interview data from across all six case study young ventures which generated 'en vivo' statements. This provided descriptors for each dimension. The development process of these descriptors enhances the validation and rationality of dimensions of the TEMP model.

Figure 4.2 TEMP Model Dimensions and Descriptors

- **Motivation** - *an entrepreneur's business vision that successfully transforms the entrepreneurial idea and intention; to create potential entrepreneurial opportunity; to enact a practical actionable plan.*
- **Entrepreneurial Experience** - *a unique life experience that is obtained by engagement in previous entrepreneurial activities; enabling ability to forecast and to mitigate against risk.*
- **Work Experience** – *to learn by 'doing'; using experiential learning processes; a potential precursor to creating a vision; increasing opportunity.*
- **Risk-management** – *swift assessment of affordable loss in NPDs; implementation of entrepreneurial processes related to innovation and new technology adoption; implicit market sensing capabilities for assessing change in the market (including changes in customer needs and government green and sustainability policies); leveraging additional resources entrepreneurially due to lack of money and investment.*

- **Proactiveness** – *exploiting opportunity; relentless pursuance for growing the business; pioneering-innovators (focussing on being first person/firm; use innovative and advanced marketing methods); strategy for marketing that is known as 'first-mover advantage'.*
- **New Product Development** – *innovative development process of products and services.*
- **Technology adoption in Decision-making** – *based on concerns about customers and marketing performance; use of the Internet and software to collect data to support the decision-making actions; reliance on entrepreneur's individual intuition and how much market information is accessible.*
- **Technology Superiority** - *competitive power; product and market segmentation based on innovations and users; tacit and unique knowledge; a key-value tool (e.g. patents) ensuring a young venture can compete by differentiation of NPDs.*
- **Innovativeness** – *a synonym for innovation to entrepreneurs in the UK energy service industry; means both advanced knowledge and technology and simplifying development of existing product designs; radical innovation in NPD and incremental innovation in marketing activities.*
- **Digital Marketing** – *a package of advanced marketing methods, such as website, Facebook and LinkedIn and SEO, that provide 24/7 services and give the consumer greater confidence; technology enhanced marketing practices (i.e. a cyber-laboratory to pilot new products and services); also collect and transform customer opinions for NPD.*
- **Search Engine Optimisation** – *innovative marketing method to understand customer needs and, forecast when the customer needs may change; ability to collect market*

and competitor's information; enhanced decision-making support; identification and seizing of novel technologies from other industries and adapting it for NPDs.

- **Market Knowledge** – *implicit external knowledge and technology collected from the marketplace and social networks, such as local exhibitions, conferences and websites; information about the latest technology in various industries, competitors and the UK energy service industry and government policy; awareness of customer needs and potential opportunities based in overseas (international) markets; reliance on 'digital marketing', 'work experience' and 'networking and partnerships'.*
- **Networking and Partnerships** – *formal and informal networks; both online (LinkedIn) and offline (local conferences and exhibitions); various forms of networks, including social media (LinkedIn and Facebook), PCNs (Carson et al., 1995; Jones and Rowley 2011), business incubements and the local university; significant policy involvement for firms, so that they have a preference for business partners to have a government background or policy-making work experience.*
- **Word-of-Mouth (WoM) marketing** – *closely associated with the term 'e-WoM marketing'; entrepreneurs identify 'opinion leaders' from their consumer group and use them to peer share information, such as testimonials, photographs of the service/product; increased consumer confidence via social networks by using Facebook and Twitter messages.*
- **Administrative Marketing** – *disassociated with the management of marketing due to firm size, marketing by traditional means, such as door-to-door canvassing, outdoor campaigns, local newspaper and radio advertisements and newsletters.*
- **Direct Marketing** – *One-stop marketing method that is adopted to reduce unnecessary middle steps between the customer and firm; to integrate and accelerate*

the marketing process; allows the entrepreneur to 'contact directly' with customer online via the firm's website Ajax technology and Facebook messenger.

- **International Marketing** – *an international vision; leveraging limited resources for identification and engagement with more global customers; a blue ocean strategy to avoid competing directly with other UK ESCos.*

4.9 Conclusion

This chapter discusses the findings of three key participant interviews and secondary data analysis of a sample of 34 selected ESCos. The data have now corroborated the twenty-six dimensions identified from the existing literature. The researcher has uncovered greater knowledge and understanding of the energy service industry, green policy industry and customer needs through the key participant interviews. This chapter also explains the validation and rationale of using secondary data to develop the TEMP model further.

The findings from secondary data affirm the dimensions of the TEMP model, while also affirming the emerging dimensions identified in the key participant interviews. Moreover, the findings enhance the content validation of the TEMP model and its dimensions. Several entrepreneurial perspectives and adopted technologies were identified to distinguish functions of IT from the technology adopted in production.

Additionally, this chapter has presented research findings from the card-based semi-structured interviews with three the UK energy service firms. The findings are analysed based on the

dimensions on cards to demonstrate and populate the TEMP dimensions in a wider industry context of the energy service providers and energy service product manufacturers. Most dimensions (22 of 26) are demonstrated with research findings. Possible explanations are discussed in section 6.5 where the interviewed entrepreneurial ventures are in their early stage of firm development. Therefore, it is impossible to perhaps expect that young ventures use technology to support their marketing decision-making in the early stages of the young venture. Further details will be discussed in the next chapter, Chapter 5, which will provide an integrated discussion of all the findings that from the literature review, website contents analysis, three exploratory interviews and the card-based semi-structured interviews.

Chapter Five: Discussion

5.1 Introduction

This chapter aims to develop a better understanding of the roles of TO and EM in new ventures in the energy service industry by discussing the empirical data of the past literature and findings from online secondary data analysis and key participant interviews (Chapter 4) and semi-structured card-based interviews (Chapter 4).

As discussed in the literature review chapter (Chapter 2), there is currently very little knowledge and understanding of the role of TO and EM. The most popular TO theories focus on product technology and innovation in NPDs, technology-based decision-making support and identify technology-based resource for a young venture. A few studies attempt to investigate the role of TO in relation to EM activities and behaviour of entrepreneurs in a given industry sector, in this case, the energy service industry. Furthermore, few EM researchers attempt to demonstrate how a combination of EO, MO and TO may impact on a young venture's performance. Therefore, this thesis argues that understanding the role of TO and EM may help researchers understand how new ventures increase chances of survival, access further resources to growth and overcome many barriers to achieve success.

This chapter presents discusses the key thesis findings (chapter 4). For clarity and focus the discussion is presented under the research question as:

What is the role of TO and EM in new ventures within the energy service industry?

In addition, the research aim of this PhD research has been to examine how EO, MO and TO (inclusive of digitally enhanced marketing activities) may contribute toward a firm's EM performance.

The chapter is organised as follows:

- Section 5.2 presents a discussion of the key thesis findings in terms of the findings from the previous chapter to answer the original research question and research objectives.
- Section 5.3 discusses the relationship between the key thesis findings raised in section 5.2 and the existing relevant literature to understand how these findings can contribute to the young venture's EM performance.
- Section 5.4 draws the chapter's conclusion.

5.2 A Discussion of Key Thesis Findings

Primarily, the findings of this research show the survival and growth of young ventures with higher levels of technology orientation (TO), which include both innovative and marketing technology having positive effects on marketing performance. Higher levels of TO adoption indicates that the entrepreneur demonstrates stronger entrepreneurial characteristics, such as proactiveness and risk-taking, which sharp the young venture's marketing activities. The entrepreneurs also tend to use various innovative technologies and marketing methods to seek new opportunities and new customers.

Using TO as indicator gives young ESCos unique competitive capacity that allows entrepreneurs to identify advantages and disadvantages within the ventures earlier than others. This unique competitive capacity gives young ESCos more confidence to join or establish various networks to understand marketplaces and competitors, and so look for customers. The networks include PCN, resource networks with local authorities, suppliers and universities and external contacts with competitors and customers via websites, Facebook and LinkedIn pages and live social events. In contrast, the failed young ventures trend toward using TO that does not include innovative marketing technology in the process of innovation and NPD and, few emerging and innovative technologies are considered for marketing purposes. Most failed young ESCos have great difficulties in identifying potential customers and business opportunities to meet customers' real needs, although they have already developed robust products and services.

One possible explanation is that TO does not include product technologies and innovative technologies independently, but also allows for collaboration/combination between them. It means that information generated from the NPD and innovation could be used for marketing to demonstrate the unique advantages of new products and create greater consumer. Furthermore, innovative marketing technologies, such as e-CRM and social media, might translate customer requirements into potential breakthrough points directly into the next generation of products.

Although most of the failed young ventures have websites and social media channels, the ventures' marketing performance is mainly achieved via traditional marketing approaches in local and regional marketplaces. Traditional marketing approaches, such as conferences and

exhibition attendance and outdoor campaign advertising, restrict the effect of EM as a business spirit and the use of innovative marketing methods in the marketing activities of these young ventures is limited. These young ventures are also heavily reliant on traditional social and business networks to seek new partnerships, customers and marketing opportunities. However, the research findings show that, compared to the web-based networks, traditional social and business networks take a long a time to identify the same volume of new opportunities and customers for the ventures.

Second, the findings indicate that the definition of TO should be further advanced by the inclusion of innovative marketing technologies, such as digital marketing, social media marketing and mobile marketing, into the original definition of TO to reach a greater understanding of marketing performance. Therefore, the researcher proposes a new definition of TO:

Technology orientation is the use of sophisticated technologies in new product development and innovation, proactively creating new product ideas; it also means the use of innovative marketing technologies as technical solution to understand and meet customers' real needs.

Empirical data suggests that the entrepreneurs of successful young ventures use a combination of productive and innovative marketing methods in their marketing activities to increase customer awareness and product profit. The entrepreneurs interviewed explained that the technological superiority of product and innovation are major selling points for advertisement development. These advertisements need to be communicated to customers through both traditional and innovative marketing methods, such as e-WoM marketing, social media

marketing and SEO. Since most productive technologies are baffling to understand on the part of customers, innovative marketing technologies help customers to understand and approve of the value of productive technology and innovation within new products/services. Therefore, TO should be redefined by not only maintaining the original TO definition of Gatignon and Xuereb (1997) as TO still have positive effects on NPD and innovation and marketing decision-making, but also by adding innovative marketing technologies. This is supported by the findings, which have identified that entrepreneurs use them to facilitate performance of young ventures' marketing.

Third, the researcher believes that a higher level of TO (which includes innovative marketing technologies) helps entrepreneurs to identify and reduce uncertainties when young ventures operate in unpredictable external environments. These research findings show three types of uncertainty; rapid changes in green energy policy; environmental uncertainty and issues with government funds and venture capital investment. Green energy policy originally aimed to neutralise risk and uncertainty faced by start-ups and young ventures by giving a set of specific rules, such as restricting the product/service list. However, the publication of green energy policy increases market competition between competitors and decreases the level of innovation in NPDs. Furthermore, changes to green energy policy have a negative impact on survival and growth of young ventures.

Entrepreneurs assess these changes of green energy policy by analysing customers' comments on Facebook pages and mobile-based survey applications and also by accessing news and data via search engines. Environmental uncertainty refers to changes in the marketplace, competitors' behaviour and customer requirements. In the young ventures with higher levels

of TO, entrepreneurs implicitly gather market information, collecting advice from customers, business partners and competitors to identify these uncertainties and to develop solutions by using innovative marketing methods, such as E-WoM marketing and Facebook and LinkedIn pages.

Furthermore, this research project identified that government funds and VC investments are beneficial to young ventures in the energy service sector; however, it takes very long time and lots of energy for the funding and investment application process. Some young ventures have lessons of cooperating with speculators, not the real investors. In addition, entrepreneurs are concerned about the relationship with external investors (stakeholders) since investors may change the marketing decisions or steal valuable customers. Apart from detecting the role of TO within young ventures, this thesis has also discussed the critical role of EM.

The researcher identified EM as playing an important role in transforming the entrepreneur's entrepreneurial idea into products/services to meet customer's requirements and therefore facilitate marketing performance. Young ventures with a higher level of EM behaviour tend to have greater marketing performance and higher chance of survival and growth. One possible reason is that entrepreneurs use EM as a value co-creation process with customer suggestions to increase their orders of products/services and maximise profitability. Conversely, young ventures with lower level of EM behaviour have higher failure rate.

The research found that these firms rely heavily on several traditional marketing disciplines, such as marketing mix, direct mail and door-to-door canvassing, while the support of

government and industry policies, such as Green Deal and ECO gives customers more confidence and allows the entrepreneur to seek new opportunities. One common mistake made by the failed young ventures is to overemphasise productive technology and innovation, but fail to recognise the importance of marketing technology. They treat technology-based product development and marketing as two different things.

EM also helps entrepreneurs to gain insights into new opportunities and customer identification via various networks. In this research, EM means entrepreneurs and marketing managers' entrepreneurial activities related to marketing which overcome the general limitations faced by most young ventures, such as resource limitations, lack of money and investment and inexperienced employees. Therefore, an EM orientation encourages entrepreneurs to use search engine and social media (e.g. LinkedIn) to develop wider external networks, more quickly.

Finally, the researcher has sought to address the role of TO and its relation to several orientations within EM theory, including EO and MO. The researcher also believes that a combination of TO, EO and MO within EM can have a significant positive impact on young venture's marketing performance. The research findings show that for entrepreneurs who use more diverse technologies for business operation and marketing, their firms demonstrate stronger performance in marketing and firm growth. It means a combination of EO, MO and TO is likely to have a positive effect on marketing performance. However, previous EM researchers have identified that either EO or MO has positive impacts on firm's marketing performance, while TO has a negative impact when investigated as a standalone. One possible explanation, therefore, is that with EO and MO combined with TO, this can positively affect a firm's marketing performance.

Therefore, the findings demonstrate that TO takes up an important role within young ventures, assisting the entrepreneur to execute entrepreneurial marketing activities, establish various networks to marketing products/service, seek new opportunities and have positive effects on environmental uncertainty. In addition, this section discusses the critical role of EM to improve young venture's marketing performance by introducing innovative marketing methods, overcoming the challenge of lack of resources, finance and inexperience. Finally, the research shows that a combination of EO, MO and TO, can demonstrably affect marketing performance positively. More details will be discussed in the next section (Section 5.3).

5.3 Discussion of Key Thesis Findings with Relevant Literature

The section discusses the findings in relation to the relevant literature as evidence demonstrating the rationality and validity of the research. The researcher discusses the critical roles of TO and EM and the relationship between them and a young venture's marketing performance by discussing various key dimensions of TEMP model. Discussion of the key and interesting dimensions also validate the construction of the revised TEMP model.

5.3.1 Context of TO: Productive Technology and Marketing Technology

The research findings of this thesis indicate that the context of TO in EM theory has been extended by including both productive technologies in NPD and innovation and marketing technologies, such as digital marketing, eWoM marketing and administrative marketing. Entrepreneurs use both productive technologies and marketing technologies integrally to facilitate marketing behaviour and performance. These findings agree with the TO definitions

found in previous studies (Gatignon and Xuereb, 1997; Srinivasan et al., 2002; Zhou et al., 2005), and demonstrate, for the first time to the researcher's knowledge, new context of TO from marketing perspective in the field of EM.

The research findings are consistent with several previous marketing research which have identified productive technologies as the main dimensions of TO. In prior research, TO refers to productive technology and technical idea and knowledge that are used to meet customers' needs (Gatignon and Xuereb, 1997). Following Gatignon and Xuereb' investigation, several critical productive technologies have been investigated in context of young ventures. Salavou et al. (2004) emphasise that TO motivates innovation in terms of new idea and solutions and new product/service development that is a key driver to firm performance improvement (Hakala and Kohtamäki, 2011; Hortinha et al., 2011).

Hortinha et al. (2011) found technology-oriented young ventures invest in innovation and NPD to facilitate further competitive advantage for marketing performance. This is echoed in the findings of this thesis by entrepreneurs' EM behaviour which shows that entrepreneurs invest a great deal of time and finance on NPD and product/service reinvention. Moreover, the positive relationship between TO and marketing decision-making has been identified by Hunter and Perreault Jr (2006). Finally, Kilenthong et al. (2015) describe the decision-making as informal decision-making process on the basis of customer feedback on products/services, while entrepreneurs need to use various technologies to improve products/services and make quick decisions regarding changes to customer needs.

However, few TO research has centred on innovative marketing technologies in the EM research field, and there has been very little published research on innovative marketing technology within the context of TO. Sürer and Mutlu (2015) proposed e-marketing as a new orientation, e-marketing orientation, and the 'e-marketing orientation' itself has had positive influence on marketing performance and innovativeness. Furthermore, Avramo (2016) has developed a model of 'digital marketing orientation' to investigate how small firm's marketing manager uses 'digital marketing orientation' to facilitate marketing performance in comparative research in Finland and Italy.

The findings of these prior studies have explored how innovative marketing technologies also contribute to innovativeness and NPD as important dimensions under TO. Therefore, the researcher asserts that innovative marketing research should be inclusive to TO research. The findings of this research show that TO together with EM is an interactive process that affects various relationships in the growth lifecycle of a young firm. Wilson et al. (1999) describe how owner-managers regarding their relationship adopt technology with employees, attitudes and behaviour in relation to technology and previous working experience. Hence, entrepreneurs and marketing managers could use productive technologies in innovation and NPD, while also being introduced as technology superiorities in the advertisement.

Furthermore, entrepreneurs could use various marketing technologies, such as digital marketing and e-WoM marketing, to facilitate marketing performance and collect information and customer feedback for new ideas and product/service development. The findings of the secondary data analysis indicate that most entrepreneurs use websites (e-marketing), Facebook and LinkedIn pages and Twitter communication (social media marketing) to advertise

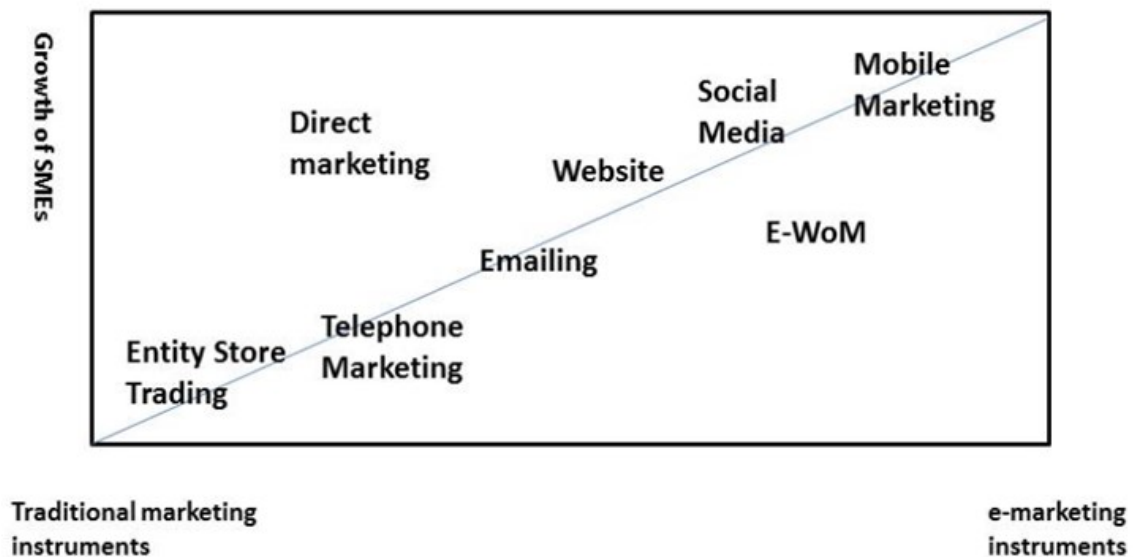
productive technology, such as new energy efficient technologies and technology superiorities to give knowledge and confidence to potential users, particularly young generation users. Entrepreneurs also encourage existing customers to provide feedback and suggestions through these innovative marketing channels, which are consistent with the findings of Nguyen and Barrett (2006)'s research where the use of e-marketing is beneficial to understanding customer's attitude and needs. Gilmore (2011)'s suggestion that use of e-marketing facilitates customer confidences and give provision in NPD and innovation and opportunity seeking.

Prior marketing and EM researchers have highlighted that social media technologies can enhance communication and value co-creation with consumers (Xiang and Gretzel, 2010; Harrigan et al., 2012b) to give information about products/services, firms and firm performance (Kaplan and Haenlein, 2010), rapid customer identification and engagement with the support of multimedia and big data technologies (Holm, 2006; Zheng et al., 2013). These research findings demonstrate that entrepreneurs also use other innovative marketing technologies, such as e-WoM marketing and SEO technologies, to facilitate firm's marketing performance.

Findings of the card-based semi-structured interviews show that entrepreneurs integrally use exhibition, search engine and Twitter status and LinkedIn pages integrally to gather information about customer needs and changes of marketplace and competitors. Ranking on the top-three page of the search engines, such as Google and Yahoo!, allows a young venture to draw further customers' attention and also increases the possibility to persuade more customers to open the firm's website and social media pages such as Facebook, Twitter and LinkedIn. Additionally, the findings of semi-structured interviews reveal that entrepreneurs frequently use e-WoM combined with WoM techniques with social media and instant

messaging software (mobile marketing) to increase customer identification and marketing performance.

Figure 5.1 The Proposed Continuum for Context of Technology Orientation



(Developed by the researcher)

The findings discussed above indicate that development of further understanding of the integral use of marketing technologies and also the investigation of TO context should be viewed as a continuum (Figure 5.1). The researcher has developed the continuum to describe how influence and implementation of TO should be studied as a whole body since the combination of various technologies have positive effects on marketing performance, whilst most marketing studies reported negative impacts of standalone technology on firm and marketing performance (O'Dwyer et al., 2009; Houghton et al., 2013). Therefore, the context of TO has been extended with the addition of innovative marketing technologies to include productive technologies to

investigate the innovativeness of entrepreneur's EM behaviour from NPD to post-sale marketing action. In addition, TO includes innovative marketing technologies which may have an indirect positive relationship on the marketing performance of young ventures.

5.3.2 TO and MO

This research has demonstrated that TO is related to MO in EM knowledge in terms of the common dimensions, including innovativeness, digital marketing, WoM (eWoM) marketing, administrative marketing, networking and partnership and search engine optimising/advertising. Furthermore, the relationship between TO and MO is both close and significant, a combination of TO and MO has a positive effect on young venture's marketing performance.

Slater and Narver (1996) have described MO as a set of marketing behaviours that use market intelligence and learning capacity to uncover new opportunities and customers and, chase profitability. MO allows entrepreneurs to create an innovation-based firm culture that emphasises the importance of innovation and R&D in NPD and facilitates operating activities within young ventures (Schindehutte et al., 2008). Furthermore, prior literature has found that MO helps entrepreneurs to identify advanced productive technologies for radical innovation (Zhou et al., 2005; Schindehutte et al., 2008) and problem solutions (Schindehutte et al., 2008) via external networks with both small and non-small firms in the same business sectors (Mu and Benedetto 2011). Both TO and MO have close relationships to the level of innovation in new product development in technology-orientated firms (Im and Workman Jr, 2004), while Luukkonen (2002) has discovered that both TO and MO are critical motivations driven to

identify new opportunity in the marketplace through using innovative marketing methods. These correlations between MO and TO are consistent within the findings of this research.

First, the findings of the key participating and semi-structured interviews echo the significance of ‘networking and partnership’ and ‘WoM marketing’ within previous research. Networking has been discussed as an effective marketing method that enhances young firms’ learning capacity to innovative idea and technological solution (Franco et al., 2014) and provides additional competitive capacity and resources to reduce limits of resources and finance and increase profitability (Mu and Di Benedetto, 2011). Prior researchers have identified that the great influences of networking on firm performance depend on formal networks, such as supply networks, social networks and Internet-based networks, established with business partners and major clients (Goldenberg et al., 2009; Mu and Di Benedetto, 2011; Stokes and Nelson, 2013; Franco et al., 2014). However, few researchers have investigated the influence of informal networking, such as personal contact networks (PCN) and referral (known as WoM) networks, within research at the interface between TO and MO in EM.

This thesis demonstrates that PCN and WoM networks have been heavily used by entrepreneurs for products/services advertising and promoting in both online and offline scenarios. PCN allows entrepreneurs to employ experienced friends and family relevant as employees, full-time or part-time, to introduce fresh ideas, new knowledge and to reduce the cost of human resources. Use of PCNs also allows entrepreneurs to access resources and external capitals from another industry or country. Moreover, employees and resources identified from PCNs give more confidence and senses of security to entrepreneurs.

Meanwhile, the findings show entrepreneurs use WoM marketing with various digital marketing technologies through social media networks, Internet-based energy efficiency and green energy service forums and live conferences and exhibitions. The findings of secondary data show that customers' testimonies and successful work cases (firms case studies) are posted repeatedly on the young ventures' websites, Facebook pages and Twitter messages to encourage enquiries from the website and social media users who have established networks with young ventures on these channels.

During the semi-structured interviews, the entrepreneurs highlight the use of LinkedIn groups and the official forums of conferences and exhibitions to access information about all the delegates and visitors. In the semi-structured interviews, the researcher noticed that some young ventures with greater marketing performance organised their networks with competitors, suppliers and valued customers based on several different networks that they had accessed. E-WoM marketing, PCN and mobile technology-based applications, such as Facebook Messenger, Skype and WhatsApp, are the approaches most frequently used by entrepreneurs to establish their networks.

The correlating relationship between TO and MO has a positive influence on young ventures' profitability and marketing performance. Webb et al. (2010) observe that MO gives young ventures creativity and the competitive ability to react rapidly to changes in the marketplace and discover new market. The reasons behind these marketing actions are chasing maximum profits and avoiding risks and uncertainties on the external environment (Gulati et al., 2006). This requests entrepreneurs to make appropriate and swift decisions about product

development and how to marketing on the basis of market knowledge and information about competitors.

Through both key participant and semi-structured interviews, this research has discovered that entrepreneurs use the search engine and social media to update their market knowledge and, use software such as Excel and Zoho CRM to assist in the decision-making processes. Entrepreneurs have described insights into market knowledge as helping them to choose the entry of domestic or international marketplaces initially, which has allowed entrepreneurs to allocate limited resources and energy on the correct opportunity and customer. Furthermore, the findings of the secondary data suggest young ventures have greater chance to survive and improve on marketing performance if they conduct international marketing activities in their early stages. Therefore, entrepreneurs use several technologies within logistics and operations, communication techniques and marketing technologies to conduct international marketing.

The findings of this research emphasise the use of SEO and SEA within the interface of TO and MO. Very little of the existing literature has discussed the influences of SEO and SEA in studies of either TO or EM. Jones et al. (2013b) have identified the significant influences of SEO on MO through networking and partnerships in the SEM tourism sector, indicating that the greater SEO the higher the ranking on the search engines meaning young ventures have greater collaborative partnerships with business partners and competitors (Jones et al., 2013b).

Furthermore, the prior SEA has research focused on search engine advertising development by measuring the keywords using and influences of pricing strategy (Dou et al., 2001). Through a

price comparison research, De Bock and Van den Poel (2010) have proved that SEA is a budget pricing strategy for SMEs compared to publishing advertisements on another digital marketing channel, such as banner advertisements on websites. These studies have not discussed how the SEO and SEA, as innovative marketing technologies, are related to young ventures' marketing performance from EM perspective.

To the researcher's knowledge, this thesis is the first EM research to demonstrate the use of SEO and SEA. The findings of the secondary data show there is a positive relationship between the SEO and SEA using and young ventures' marketing performance. Additionally, the findings of semi-structured interviews emphasise that higher ranking on search engines will allow consumers to identify several digital marketing channels, including website, social media pages and news about past business achievements of the young ventures and entrepreneurs rapidly. The findings have also identified several influences of using SEO and SEA which include (1). helping entrepreneurs to develop insights into market knowledge and changes; (2) developing the bi-directional understandings between entrepreneurs and customers by analysing keywords used and, (3) identifying lots of new customers and business opportunities with international energy suppliers through advertising products/services effectively for a budget cost. The researcher believes that SEO and SEA have significant influence on the interface of TO and MO since it is difficult to imagine any digital marketing method affecting firm's marketing performance without using search engines.

Finally, the further dimension of 'direct marketing' has been identified as an emerging dimension within MO. Although direct marketing has non-significant influence on the interface between TO and MO, the findings of this research demonstrate that direct marketing is an

effective marketing method for young ventures to facilitate marketing performance by developing close relationships with target customers and reducing most affordable entrepreneurial costs on the intermediate steps between young ventures and customers.

5.3.3 TO and EO and Entrepreneur's ideas and intentions

The findings of the thesis show that TO has a relationship with EO because the entrepreneurs use experience and entrepreneurial characteristics, such as proactiveness, risk-taking and innovativeness, to improve marketing performance. In this thesis, the researcher has investigated two types of entrepreneur's experience entrepreneurial experience and work experience while the findings indicate they are intertwined. During the key participant and semi-structured interviews, most entrepreneurs explained their entrepreneurial experience mainly come from training and practice in previous positions, while some of the other entrepreneurs learned from helping their friends to set up firms. Most entrepreneurs with entrepreneurial experience had run at least one firm in different sectors before.

Regardless of achieving success or not, these entrepreneurial experiences are beneficial to the current young ventures through management and daily operating, NPD and marketing activities. Moreover, the findings also show that the entrepreneurs who claimed non-entrepreneurial experience but had work experience still had some entrepreneurial experience. Most non-entrepreneurial experience holders used to work for large energy supplying companies that gave them several opportunities to observe and collaborate with the young ventures of ESCos. Hence, the entrepreneurs are familiar with the steps of fundamental procedures and difficulties of founding firms. Both entrepreneurial and work experience gives the entrepreneur advantages with advanced technology.

Gounaris (2008) has identified that dissatisfaction from prior work experience to be one of the major motivations for entrepreneur to found new firms, as entrepreneurs believe in act differently is an effective way to reduce the dissatisfaction. Innovative technology is a vehicle that helps entrepreneur act differently (Watson et al., 1998). In addition, the decision-making by entrepreneurs requires experience and technological information. Burgel and Murray (2000) have demonstrated that the decisions made by entrepreneurs are informal and individual, while these decisions are made based on the entrepreneurs' prior experience, and the up-to-date information collected with innovative technologies. Additionally, work and entrepreneurial experience influence network establishment and the ability to seek more opportunities and customers as it gives more confidence to other members of the networks, such as local government officers, suppliers and customers and competitors.

This thesis has found that several key entrepreneurial characteristics, such as proactiveness, risk-taking and innovativeness, influence on the interface between TO and EO. Several previous studies have highlighted proactiveness is a significant dimension of EO that drives an entrepreneur to operate young ventures effectively and to improve marketing performance. The findings show that proactiveness drives entrepreneurs to develop young ventures by practising different technologies and marketing methods in EM activities, comparing the products/services with competitors to win the champions from several energy efficiency competitions. This finding echoes the research outcomes of Hills (2011) that proactiveness had positive impacts on entrepreneurial activity, such as new customer and opportunity identification, rather than reactive approaches.

The other key dimensions of EO, risk-taking, encourages entrepreneurs to take opportunities that come with risks together and have the latest technology that includes first-mover advantage and unexpected problem. These findings are consistent with prior EM research. For example, Lechner and Gudmundsson (2014) found risk-taking is relating to risks and uncertainties of the external environments. Innovativeness is one of the significant correlated dimensions between TO and entrepreneurial behaviour. Lechner and Gudmundsson (2014) have also identified innovativeness to motivate entrepreneurs to invest in NPD, innovative activity and increasing competitive capacity by taking on new innovative technology and ideas.

Moreover, the findings of this thesis indicate that entrepreneur's ideas and intentions have an indirect relationship with TO through entrepreneurial activities of EO. Some studies have investigated the entrepreneur's idea and intention. One possible explanation is that prior researchers naturally consider the two dimensions as parts of entrepreneurial activities and do not emphasise their influence on entrepreneurial behaviour, decision-making and use of innovative technology. In terms of the TO definition given by Gatignon and Xuereb (1997), TO helps entrepreneur to transform the original entrepreneurial idea and intention into products and services, particular with productive technology. Manion et al. (2000) have found a weak relationship between the entrepreneur's ideas and new opportunity identification as well as marketing performance. This has changed since a contingency model was introduced into EM theory to identify EM activity and highlight its competitive advantages on small firms by Deacon et al. (2015). Deacon et al. (2015)'s research has identified that entrepreneur's ideas and intentions are the starting points of any EM process, while the ideas and intentions are frequently influenced by entrepreneurs' decision-making and attitudes to new knowledge and skills. The researcher of this research has also noticed that most entrepreneurs are continually

developing and investing their products and services following the initial entrepreneur's ideas and intentions.

Finally, the role of TO within EM is bridging the gap between EO and MO since the relationships between TO and MO, and TO and EO are correlated respectively. Correlated with TO, EO includes experience and key characteristics of MO as the sets of marketing behaviour seeking opportunity and customers and chasing profit, which can be combined to facilitate young venture's marketing performance.

5.3.4 TO and Customer Needs

The findings of the research demonstrate that the influences of TO and customer needs are positive and bi-directional. Bi-directional means that TO helps entrepreneurs to identify and meet customer needs by adopting innovative marketing methods, such as social media marketing, SEO and mobile application. In addition, growing customer needs also encourage the entrepreneurs to use further innovative technologies into NPD, operating process and marketing action. Tajeddini et al. (2013) claim that customer needs consist of customer identification, customer requirement, customer satisfaction and customer loyalty. Prior marketing researchers have investigated the influence of EO on customer needs through innovativeness dimension (Tajeddini, 2010; Filser et al., 2014). Tajeddini (2010) has conducted similar research that demonstrates a positive correlating relationship between innovativeness and customer needs in firm performance in the SME retailing sector.

In any marketing research, customer needs are extremely important for small firms' survival and marketing performance improvement (Narver and Slater, 1990; Hakala and Kohtamäki, 2011) because customer needs effectively impact on entrepreneur's marketing behaviour to facilitate small firm's marketing performance (Slater and Narver, 2000). Furthermore, Hakala and Kohtamäki (2011) argue that delivering knowledge about innovation and technology superiority within NPD is significantly important because most consumers refuse to buy unfamiliar new products. Hence, successful young ventures develop differences in NPD and innovative marketing methods to distinguish them from competitors (Day and Hubbard, 2003).

Ali et al. (2016) have argued that TO have greater influences on how entrepreneurs to understand customer needs and identify new customers. Although EO and MO have been proven to facilitate marketing performance respectively, Christensen and Bower (1996) point out that market-oriented and EO firms had high risk for failure when the firms are over reliant on the mastered competitive advantages, such as networks and partnership but ignoring the development of technology.

The findings are consistent with the findings of prior literature. Both findings from the secondary data analysis and semi-structured interviews demonstrate that the insights into customer needs help entrepreneurs to adjust marketing behaviour and products/services to facilitate marketing performance. The entrepreneurs taking part in the key participant and semi-structured interviews believe that customer satisfaction and customer loyalty are important. Moreover, another correlative dimension between TO and customer needs is e-CRM.

5.3.5 TO and External Environmental Factors

The research findings demonstrate that entrepreneurs use TO within EM behaviour to deal with changes in the external environment as well as increasing investments for young ventures. The findings show that TO is less related to the dimensions ‘Green Policy and Sustainable Initiatives’ and ‘Venture Capitals and Government Funds’ under the category External Environmental Factors. However, the influence of TO on environmental uncertainty is significant.

The findings indicate that entrepreneurs use limited productive and innovative marketing technologies to deal with issues that are caused by changes in policy and sustainability. Prior researchers have identified that the latest green policy, Green Deal, is not only beneficial to the young venture development, but is also a major cause for environmental uncertainty and unreliability (Rosenow and Eyre, 2012; Booth and Choudhary, 2013). Zhou et al. (2005) have claimed that TO, including technology-based new ideas and innovative technologies, excels in reducing external environmental uncertainty, such as customer requirement uncertainty, technology turbulence and competitions of competitors. Since green policy may cause environmental uncertainty, it is possible that TO helps entrepreneurs to deal with the uncertainty caused by green policy. The findings of this research suggest that entrepreneurs use search engines and networks to forecast the changes of green policy. However, neither productive technology nor innovative marketing methods help young ventures to reduce uncertainty and financial losses. Therefore, there is a weaker association between the entrepreneur’s EM activity and green and sustainable policy and TO.

5.4 Chapter Conclusion

This chapter has discussed the research findings in response to the research question and research objectives proposed in chapter 2. The chapter has discussed the role of EM as a significant indicator of the way in which entrepreneurs uncover information and identify marketing opportunities, while exploring the role of TO and its role with EM, specifically including EO, MO and customer needs.

The research findings recommend that entrepreneurs undertake TO, which includes both productive and innovative marketing technologies as key drivers to facilitating young venture's marketing performance. TO helps young ventures to seek new opportunities and customer via various kinds of networks, while also helping the entrepreneur to deal with different challenges with a series of innovative marketing technologies, such as eWoM marketing, digital marketing and SEO.

EM enables the entrepreneur to adopt marketing behaviour which aids the firms' survival and growth in uncertainty environments. Entrepreneurs implicitly use EM as a value creation process to chase maximum profitability and growth. In addition, EM considers both financial and non-financial features in the value creation process. To identify new customers and opportunity and gain insights into customers' needs, EM, as an innovative marketing approach, helps young ventures to deal with limits of resources, finance and inexperienced employees.

The research findings are also discussed in the light of the relevant literature in terms of the research question and research objectives. A discussion of the research findings has demonstrated the functions of the TEMP model. Next, several theoretical contributions and practical implementations has been discussed to give recommendations for EM marketing researchers, entrepreneurs of young ventures and green energy policy-makers. Finally, this chapter has also acknowledged a few research limitations in relation to the limited scale of the purposive sample as it is qualitative research. Future research suggestions to be taken by future EM researchers have also been discussed, particularly comparing research between UK young ventures and those of other countries and similar EM and TO research within non-profit young ventures.

Chapter Six: Conclusion

6.1 Introduction

This research investigates the roles of TO and EM within a young venture; namely, an independent SME founded during the past six years operating in the energy service sector. The TEMP model has been demonstrated and populated to develop a thorough-understanding of what the dimensions and how they impact on the firm's marketing performance. Consequently, the thesis generates an understanding that both TO in relation to EM and the combination of TO, EO and MO have a significant impact on firm's marketing performance.

The methodology uses the case study research approach with the participating online observation and card-based semi-structured interviews to collect data from several selected UK ESCo young ventures. Moreover, the researcher uses the triangulation data analysis approach to identify several important findings. This chapter presents the summary of main conclusions, contributions and implementations, alongside research limitations and recommendations for future research.

The chapter is organised as follow:

- Section 6.2 presents a summary of this PhD research
- Section 6.3 presents both theoretical and practical contributions which emphasise the value and importance of implementing this research project.
- Section 6.4 discusses future research and acknowledges the limitation of this research.

- Section 6.5 presents research suggestions that discuss several potential research directions for future researchers.

6.2 Overview of the Research

The main purposes of this thesis have been to investigate the roles of TO and EM in the young ventures' entrepreneurial marketing activities and whether the roles have a positive impact on facilitating marketing performance. The thesis uses the UK energy service companies as research sample since a growing number of young ventures have been founded by entrepreneurs since 2012. The entrepreneurs' marketing behaviour and ESCo young ventures' marketing activity has provided rich data for the researcher to understand 'why' and 'how' such innovative marketing methods can facilitate the marketing performance and help the firm to survive and grow.

This research aims to *examine how EO, MO and TO (inclusive of digital enhanced marketing activities) may contribute towards young venture's EM performance in the UK energy service industry sector*; and the research question is: *What is the role of TO and EM in young ventures within the energy service industry?* In addition, the research objectives are listed as: (1) To collect literature evidence of EM, TO and UK ESCOs and green energy policies to develop TEMP model; (2) to use key-participant interviews to identify existing dimensions as well as emerging ones; (3) to use online non-participant observation to identify existing dimensions as well as emerging ones; and (4) to further use semi-structured interviews to populate the TEMP model, develop descriptors for each dimension and, to corroborate the dimensions within both Green Deal based and non-Green Deal based young ventures.

The nature of the research question guides the researcher to use the qualitative research method with the case study that includes the documentary data analysis of the UK green energy policy, secondary data for the online non-participant observation and card-based semi-structured interviews to develop a comprehensive understanding of the ESCo young ventures' phenomena. Several emerging dimensions and new understandings of other dimensions identified from prior literature have thus contributed to the development of EM theory.

The prior literature (Chapter 2) has demonstrated that EM is an innovative marketing discipline generated from SME marketing studies, focusing on the young venture's entrepreneurial marketing activities. The positive impacts of EM on small firm's performance have been identified from several perspectives, such as the entrepreneurial characteristics under EO and innovative marketing methods and networks under MO. Furthermore, the prior literature has shown the correlating role between TO and EM where TO has been considered as a key component for decision-making to the entrepreneur in previous EM studies (Gatignon and Xuereb, 1997; Zhou et al., 2005; Hakala and Kohtamäki, 2011).

The definitions of TO have emphasised the adoption of productive technology in NPD and innovative and technological idea and solution into young ventures (Gatignon and Xuereb, 1997; Batra et al., 2015; Ali et al., 2016). However, only a small number of prior studies have attempted to investigate whether or not the other technologies of TO, such as innovative marketing technology, and the correct dimensions of TO impact on young venture's marketing performance. Additionally, there is a paucity of the existing EM models allowing the researcher to adopt to understand the roles of TO and EM within the young ventures from a marketing

perspective. Therefore, the researcher has developed a new conceptual model, the TEMP model, based on the 29 dimensions identified in the prior EM and TO literature.

Next, the methodology in this thesis has been developed based on the nature of the research question. At the beginning of chapter 3, the researcher compared several research philosophical positions and decided to adopt interpretivism as the epistemological position while the ontological position selected is constructivism (Carson et al., 2001; Deacon and Harris, 2011; Bryman and Bell, 2015). This decision is made by reviewing the nature of the research question that investigates the phenomena of the energy service young ventures and developing a thorough-understanding of these phenomena based on the entrepreneurs' explanations.

The research question suggests a qualitative research design for this thesis. Consequently, the thesis uses case study research approach, which has employed online non-participant observation and card-based semi-structured interview to collect empirical data from several sources. The online non-participant observation has allowed the researcher to browse the selected UK ESCOs' websites, Facebook and LinkedIn pages and Twitter conversations with consumers. Also, the researcher has collected further documentary data, such as firm reports, financial abbreviation reports and news reports and case studies from either the ESCOs or the third-party company information providers, such as the CompanyCheck.com. The card-based semi-structured interviews assisted the researcher to collect primary data with the entrepreneurs.

Additionally, several UK green policies, such as Green Deal and ECO, have been analysed by the researcher to understand its influence on the marketing activities of the young venture (in Chapter 4). The data collected have been analysed in triangulation to demonstrate the validity

of the existing dimensions and identify emerging dimensions in TEMP model. Six emerging dimensions, including SEO, SEA, 'Direct marketing', 'Guerrilla marketing', 'International marketing', and 'Green Policy and Sustainable Initiatives' have also been identified for TEMP model.

The findings from the confirmed dimensions have been identified from the prior literature and identified emerging dimensions for the TEMP model. Furthermore, the findings have helped the researcher and readers of this thesis to gain insights into the roles of TO and EM in young ventures. In Chapter Four, the thesis conducted an overview of the development of UK energy service industry and green energy policy and, found that green energy policy, such as Green Deal and ECO, could be beneficial to innovation and NPD and provides government funds; however, it is also a source of the uncertainty for the ESCos. Green Deal defines the products range and categories to help the entrepreneur to develop and deliver the proper products in the market, however, the specific definition of what product should also be provided restricts the capacity for innovation and increases competition between the ESCos.

Furthermore, the researcher has conducted the online non-participant observation and card-based semi-structured interviews of the empirical data collected from several green deal and non-green-deal based young ventures and identified that the roles of EM and TO are significant. EM has helped entrepreneurs to transform the initial entrepreneurial ideas and intentions into their marketing activities and encourage the adoption of various networks and innovative marketing methods to seek new opportunities and customers. The findings have shown that the entrepreneurs have defined TO as a concept that includes both productive and innovative marketing technology, while also demonstrating how both productive and innovative

marketing technologies have been used for the young ventures' marketing events. Additionally, the TEMP model has been generated and populated as the theoretical framework.

Finally, the thesis has discussed the main findings in answer to the research question in chapter 5, while the researcher presented the theoretical contributions and implications, research limitations and proposed several suggestions for future research in this area in this chapter (Chapter 6).

6.3 Theoretical Contributions and Practical Implications

6.3.1 Theoretical Contributions

This thesis has provided several contributions to the growing interest in the research of EM and innovative technologies. The overarching theoretical contribution of this thesis is the TEMP model. The TEMP model has been developed in terms of the dimensions identified from past EM and TO literature and emerging dimensions identified from empirical data collected from secondary data analysis for online non-participant observation, key participating interviews and card-based semi-structured interviews. Combining existing EM and technology knowledge with entrepreneurial practitioner's experience, this model emphasises the significant role of TO in young venture's EM activities from the marketing perspective.

The TEMP model demonstrates feasibility and usefulness since it shows that a combination of EM and redefined TO (includes both productive and marketing technologies) has positive effects on the new firm's marketing actions. This research defines TO as:

the use of sophisticated technologies in new product development and innovation, and proactively creating new product ideas; it also denotes the use of innovative marketing technologies as a technical solution to understand and meet consumer's new needs.

The new definition of TO extends the concept of technology that not only is the productive technologies but also includes the advanced technologies used for a firm's marketing activities. The new definition of TO helps entrepreneurs to understand the potential opportunity and changes in customer needs for NPD and innovation while it also allows consumers to understand nature of the productive technologies through interacting with entrepreneurs on various marketing activities.

The research findings show that the entrepreneurs have used marketing technologies, such as Facebook, LinkedIn and Google search engine, to collect data about the market information and new customer needs. Subsequently, the entrepreneurs combined these captured data with productive technology into the NPD process of a product. Meanwhile, some interview participant entrepreneurs also used information of productive technologies in the context of advertisements to create unique marketing advantage and draw consumer's attention. In addition, the past EM literature has acknowledged very little EM model with innovative technologies for either the qualitative or the quantitative researcher. Therefore, the development of the TEMP model may provide a great starting point to investigate the relationship between EM and various innovative technologies for future EM researchers.

The researcher has proposed that another critical research contribution in so far as the re-definition of TO, specifically within EM, should include both productive technology and marketing technology. Past TO and marketing researchers (O'Dwyer et al. 2009; Stoke 2000; Gatignon and Xuereb 1997) believe that TO means producing technologies in NPD and innovation process. However, the researcher has discovered from dialogues with several interview participants that TO means not only productive technologies but also innovative marketing technologies, such as SEA, FaceBook page and Twitter use and mobile marketing to identify customer's requirements.

This finding is significant because a growing number of recent EM researchers are proposing standalone innovative marketing technology orientations to EM theory. This includes 'digital orientation' that use marketing insight and various digital marketing methods to enhance customer communication and identify opportunity (Quinton et al., 2017), e-marketing orientation (Mutlu and Surer 2015) and innovative marketing orientation that discusses how web-based technologies assist entrepreneur to recognise customer value (requirement) in international marketplaces (Chaston, 2015). However, the impact of innovative marketing technologies has been studied individually ignoring the interaction between different technologies. This thesis has filled the gap by investigating TO that includes all relevant marketing technologies with productive technologies integrally.

Furthermore, the role of TO has been identified as a bridge between EO and MO to accelerate the collection of customer information, understand customer needs deeply and seek new opportunities on the market. The thesis findings have shown the positive impacts derived from a combination of TO and EO and MO on new ventures' marketing performance. This is hence

a significant contribution because past research shows the negative influence of TO on marketing performance and seldom research attempts to investigate the combined impacts of TO and another orientation in EM research.

6.3.2 Implications for Entrepreneurs

This research has recommended that entrepreneurs should proactively collaborate with higher education institution (HEI), such as universities, to practice and improve the entrepreneurial skills for marketing actions and firm survival. Although the interviewed entrepreneurs demonstrate that young ventures could have business solution packages from other young ventures or local business incumbents, they have very limited knowledge and support about marketing in the packages. Hence, entrepreneurs should develop the collaborative relationship with innovative marketing researchers, such as EM teams. The EM teams of HEI could help entrepreneurs to transform the entrepreneurial characteristics, experience and rough ideas into distinct competitive advantages for ESCOs' marketing activities. Furthermore, HEI can also collaborate with EM teams and ESCOs to develop new products from prototypes and apply for patents.

The implementations are also suggested that entrepreneurs can adopt innovative marketing methods to improve the young ventures' marketing performance and reduce environmental uncertainty. Young venture's marketing performance is monitored by entrepreneurs through using the number of customers, completed trades and pre-orders of products/services, which is achieved by the integration of innovative and traditional marketing methods. However, not all entrepreneurs are doing this and may require further support to improve the adoption of innovative marketing approaches.

The entrepreneurs of young ventures with greater marketing performance have demonstrated that search engines, Facebook and LinkedIn pages, outdoor campaign advertisements and conference and exhibition attendances can identify new opportunities and customers. They may also use email, door-to-door canvassing and Facebook and LinkedIn pages to advertising and draw customers' attention. All these marketing approaches lead customers to the websites to search for more information about products/service and start conversations with ESCOs. After the product is installed or service is completed, mobile marketing activities with post-sale survey applications assist the entrepreneurs to collect users' feedback and suggestions for future business. Furthermore, innovative marketing also helps entrepreneurs to develop international marketing strategy such as 'Blue Ocean' strategy and this decreases uncertainty in domestic market.

6.3.3 Implications for Green Energy Policy Makers and Government

This section will provide several implications for UK green energy policy-makers in terms of the key issues of Green Deal and ECO raised by the interviewed entrepreneurs and DECC's government reports. Entrepreneurs have realised the critical roles of green energy policy that describe the green deal process, standards and specifications and product/service categories in the marketing activities. ESCOs display the relevant GD certificates on their websites and Facebook and LinkedIn pages to give confidence to all potential business partners, customers and other GD providers (ESCOs). However, the entrepreneurs in both key participant and semi-structured interviews also discussed several concerns about green energy policy.

Most entrepreneurs have difficulties in fully understanding the context and advantages of the green energy policies since the entrepreneurs had very limited knowledge and experience about

the energy service industry. There is no official handbook published by the government (i.e. DECC) as a guide on how to implement business and marketing for entrepreneurs who have less experience and knowledge about this industry. Furthermore, most customers and entrepreneurs have acknowledged that they have failed to identify the benefits of the latest green energy policy compared to the previous ones. Entrepreneurs and customers require further general knowledge about the industry and information about green energy policy before they make a decision. Therefore, the research findings suggest that the green energy policy-makers develop official tutorials, introductory videos and advertisements, publishing them on various media platforms, such as televisions, radio broadcasting, UK government websites and YouTube channels. Furthermore, the government could set up the call centres or use live chats on the GD official website or Skype to answer entrepreneurs' inquiries. The primary data collected from the call centres and live chat systems could help policy-makers to discover potential loopholes and assist in developing an amendment of green energy policy.

The financial scheme and reimbursement procedure is another 'ad-hoc' concern of entrepreneurs and customers regarding the existing green energy policy. The concerns centre on the long wait for funding application and the limited amount of reimbursement compensation provided by a green energy service scheme. With regard to the long waiting times for application concern, this research recommends that policy-makers design the system for funding application again and, use 'big data' (also known as data mining) systems to accelerate the application processing and reduce labour workloads.

The entrepreneurs in the interviews describe the green energy service financial schemes as using the score-based system that requests ESCOs (young ventures) to collect enough points

for every step of applications. ESCOs spend on average nine to fifteen months to collect points. In addition, there is very limited sources listed on the scoring system for all applicants to collect points, which may cause another unnecessary cost and competition among the ESCOs. Hence, this thesis recommends that policy-makers may design a flexible score-based system that allows ESCOs to use their particular products/services, patents, competitive advantages and extraordinary marketing performance to obtain some scores.

In addition, the other issue is one of too many applications that slows down the application procedure since most steps of the funding applications are processed by employees of local authorities and centre green energy service department manually. It is recommended that government could use a 'big data' system, such as websites and mobile applications, for the initial round of application processing. Policy-makers could set up specific criteria for the 'big data' based score application system to evaluate numeric applications based on the 'big data' analytical algorithms, such as Naïve Bayesian Classifier. Qualified applications will then be passed to the employees for final decision-making and thereby will spend less time spent on processing applications. Green energy policy-makers and government need to be more explicit about green energy funding. The researcher suggests that the government cooperates with large international corporations who excel into the green energy and environmental protection sectors to provide continuing financial supports to ESCOs.

Another recommendation for policy-makers is to stop attempting to over protect ESCOs and manipulating the market to reduce the potential uncertainties. Government reports (DECC 2015) about Green Deal and ECO point out that Green Policy contains rules which regulate young ventures' actions, the boundaries of energy service business scope and lists of

products/services to minimise the risks and uncertainties that ESCos would face. However, these contexts also restrict the power of innovation and discourage the young ventures of ESCos to achieve further profits by taking affordable risks in some uncertain environments. Therefore, policy-makers might focus on the justification of the energy service terms and leave the decision-making rights to the entrepreneurs of ESCos.

6.4 Research Limitations

This research has investigated a relatively unknown area of research. Therefore, a qualitative, inductive research approach was considered most appropriate. The findings have enabled the surfacing of the ‘how and why’ question which occurs in the ESCos context in respect of EM and TO.

As with all research, this research is not without some research limitations. One limitation is the measurement of the efficiency of TO dimensions is unclear as it contains six dimensions that contain productive technology, innovation technology and marketing technology. Prior TO researchers (Zhou et al., 2005; Kreimer, 2014; Lee et al., 2014a) prefer to use Gatignon and Xuereb (1997)’s four-scale measurement to priorities the TO dimensions about NPD and innovation. Meanwhile, Trainor et al. (2014) evaluate TO dimensions that about innovative marketing technologies by using ROI, user engagement number and scale of information (advertisement) spread.

It is possible to conduct further quantitative studies for developing a general measurement for TO in EM research. The other drawback is all the data about the dimension 'Marketing Performance' are self-reported based on the participating entrepreneurs' understandings of the technology-orientated energy service young ventures. Wang (2008) and Gonye et al. (2014) are concern about using self-reported data to understand the dimension 'Marketing Performance' during the interviews. It might be understood and evaluated differently by entrepreneurs and founder-owners of other young ventures in the UK energy services sector.

6.5 Suggestions for Future Research

A comparative research of EM and TO in relation to UK young ESCOs and other country's needs could be undertaken and be further investigated. Such a comparison of young ventures in UK and other culture, such as China, may determine the different meaning of EM for Western and Eastern cultures in terms of the difference in population of countries, cultures and levels of economic development. Astini and Tafiprios (2017) have found that the adoption of TO help entrepreneurs to produce a better understanding of cultural differences than others on an industry level. It is possible to gain insights into the impacts of culture as unique competence on growth of entrepreneurial young venture (Deshpandé et al., 2013). Furthermore, future research should use quantitative methodologies with survey questionnaires to determine the priority of TEMP dimensions.

Secondly, this thesis has investigated the uses of TO and EM on the industry level. Future researchers are suggested TO and EM from other perspectives, such as organisational learning capacity (Hakala and Kohtamäki, 2011; Lichtenthaler and Lichtenthaler, 2016) and customer

segmentation (Tsou et al., 2014). In technology-oriented young ventures, organisational learning capacity is recognised as the efficiency ability to uncover and adopt emerging technology and technological knowledge from other industry (Im and Workman Jr, 2004; Talke et al., 2011). Moreover, it may facilitate marketing performance of the technology-oriented energy service young ventures through partnerships with firms in other industries (Slater et al., 2014) and exploring business opportunity in global markets (Lichtenthaler, 2016).

In addition, TO and EM may be investigated from a customer perspective. Hakala and Kohtamäki (2011) suggesting that further study should be conducted in the combined effects of CO, TO and EO on a firm's business performance. From customer behaviour, Webb, Ireland, Hitt et al. (2011) note that CO and emerging communication/marketing technology can help SMEs to identify advantages inside firms, so outlining risks and business opportunities earlier than others. Therefore, Webb et al. (2010) suggest further research to investigate the possible customer relationship and the value of customer knowledge on firms' growth and business performance. Furthermore, it is possible to investigate the relationship between entrepreneur's decision and consumer behaviour for innovation and firm performance (Kilenthong et al., 2015).

Thirdly, future research could focus on using a quantitative method to prioritise all dimensions in the TEMP model and develop a unified measurement for TO. This research uses purposive sampling of technology-oriented young ventures in the UK energy service sector. This approach does not entail that the use of EM and TO in other young ventures is not important. It is possible to use survey questionnaire and multivariate analysis (Kasim and Altinay, 2016),

while these further investigations of TO and EM with quantitative research may develop a more comprehensive understanding of all the dimensions existing in the TEMP model.

Entrepreneurial marketing is also very important to young non-profit ventures in many phases of the UK's economy, such as sport, social welfare and software. The UK government published the compact agreement to guide and support the setups of voluntary and non-profit firms and developments. Therefore, this research may be applied to young non-profit ventures. Dimensions, including proactiveness, government funds and environmental uncertainty, may be the key components of the marketing activities of young non-profit ventures. The application of TO in collaboration with innovative marketing, such as Facebook marketing and mobile marketing, may assist young non-profit ventures to investigate new and potential emerging dimensions that enhance marketing performance and the relationship between the government, young non-profit venture and local consumers.

Finally, this research has focused on the impacts of TO and EM theory. This thesis has investigated the relationship between TO, EO and MO and customer needs in EM theory. It would be interesting to consider another orientation, such as learning orientation, as a means of ascertaining a new bridging dimension which affects marketing performance.

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Appendix A

Key Issues Arising from Changes in the UK Green Energy Policy

This section considers the key issues emerging from changes in the UK Green Energy Policy. Firstly, the latest green energy policy, Green Deal, is similar to previous energy efficiency initiatives and customer may get confused when they attempt to choose an energy efficiency programme. As mentioned in Table 3.2 the development of Green Deal involves collaboration among the government, local authority and the energy supplier. Moreover, Green Deal is not the first government funded green energy policy. In addition to the Green Deal, ECO, RHPP and Warm Front all provide cash back incentives to consumers. As discussed earlier, due to the complexity of Green Deal, not only consumers but also small business owners (entrepreneurs) of ESCos facing difficulty to understand and subsequently they are opting to explain the contexts of green energy policy. Consequently, entrepreneurs are likely to fail to highlight entirely about the benefits of green energy policy to potential customers.

There are several types of Green Deal companies, for example; Green Deal providers, Green Deal assessors and installers, Green Deal finance companies and Green Deal consultancies. Murray, a Guardian News Analyst, found the biggest impact of changes to the Green Deal is on Green Deal finance companies, following the government's decision not to provide additional funding in 2015 (Vaughan, 2015). Changes to funding also have a negative impacts on the Green Deal consultancies and installers as these firms have to wait for an extended period to collect money from the customers. Murray (2015) predicts the failure of the Green Deal is due to the loss of its most significant feature as against the ECO, government fund reimbursement. Therefore, more consumers and ESCos will choose to use ECO solutions for

their housing stocks because the large energy companies still have funds and can reimburse for ECO products.

Appendix B

A Summary of Product Technologies and Marketing Technologies for Selected 34 ESCos

Technologies/ Firms	Firm 1	Firm 2	Firm 3	Firm 4	Firm 5	Firm 6	Firm 7	Firm 8	Firm 9	Firm 10	Firm 11	Firm 12	Firm 13	Firm 14	Firm 15	Firm 16	Firm 17	Firm 18	Firm 19	Firm 20	Firm 21	Firm 22	Firm 23	Firm 24	Firm 25	Firm 26	Firm 27	Firm 28	Firm 29	Firm 30	Firm 31	Firm 32	Firm 33	Firm 34	
Solar Panels	√	√	√		√					√	√	√				√						√				√						√			
Heat Pumps (Ground/Air/Water)		√									√		√			√	√			√											√				
Under Floor Heating		√								√			√								√	√													
Boilers & Boiler Services			√	√							√	√	√		√				√				√	√	√							√			
Wall/Roofing Insulation			√	√				√	√	√						√	√		√	√											√	√			
Smart Meters			√							√			√										√	√								√			
Energy Efficient Lighting											√												√					√							
ECO Financial Scheme	√		√	√		√			√	√			√	√		√								√				√	√	√		√	√		
Green Deal Financial Scheme	√		√	√	√	√		√	√	√	√		√	√	√	√	√	√			√	√		√	√			√		√	√	√	√	√	√
Energy Consulting						√					√		√												√			√	√	√					
Renewable Solution				√		√						√											√			√			√		√		√	√	√
Glazing																	√		√	√															
Energy Efficient Software																		√								√									
Inflector/ FAR-IR																												√							
Advertisements on Newspapers/Radios			√	√			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√			√	√			√

Direct Mails	√	√	√			√	√	√		√	√	√	√					√					√	√	√				√	√	√	√	√			
Exhibitions and Conferences				√			√																		√						√					
Telephone Marketing	√	√	√			√	√	√	√	√	√	√	√		√	√		√					√	√	√	√	√		√		√	√	√			
Offline Networking	√				√		√	√							√						√	√	√	√	√			√								
Websites	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
e-CRM (Website memberships, Cookies)	√		√			√				√			√		√		√	√	√		√		√								√		√			
Facebooks	Not Accessible	√	√	√	√		√		Not Accessible			√			√				√	√	√		√	√		√	√					√				
Twitters	√	√	√		√	√	√			√	√	√	√	√	√	√			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
LinkedIn	√		√		√					√	√	√	√		√					√	√		√	√				√		√		√		√		
YouTube Video Tutorials				√						√	√					√						√		√								√				
Online Networks					√	√					√					√						√														
Blogs/e-Magazines/Newsletters													√			√			√		√				√				√	√						
Ads on third-party energy provider websites	√	√	√	√	√		√				√					√	√		√				√		√		√	√								
Content Marketing (Online)			√		√	√					√					√						√						√	√							
Search Engine Ranking										√			√																							
Promotion on social media (Twitter)				√					√	√						√			√	√										√						
Mobile Apps											√						√																	√		

Appendix C

An Analysis of the Web-based Non-Participant Observations of 34 Energy Efficient Young Firms

The UK government announced the failure of Green Deal in January 2015 (Syal, 2016). A number of ESCOs entrepreneurs decided to quit the energy service industry since firms would no longer be receiving any benefit from government. As the researcher was in the process of collecting data and contacting suitable firms to interview at this time, apparently ESCo firms were ceasing to trade. To understand the impact of the green energy policy change few sampled firms were chosen for the study, the researcher conducted an analysis of the selected 34 ESCOs' profiles. Table C-1 summarises the current firm status of 34 selected ESCOs after the Green Deal was announced as a failure. Seven ESCOs (20.6%) are currently in liquidation or have been dissolved. 27 energy service young firms (79.4%) are still active.

Table C-1 A summary of 34 ESCOs status' at the post-Green Deal era

Firm Status	Active	Liquidation	Dissolved
Firm ID.	27	6	1

The potential reasons for the failure of these firms are considered below from a number of perspectives including performance and cost, use of information, and marketing technology adoption, this being the main focus of this research study. Figure C-2 shows the lists of the

companies which failed, their website and technology marketing status and, their marketing previous marketing approaches deployed.

Table C-2 List of failed firms and potential factors that may cause the failure of Green Deal

ESCos	Firm Age	Size	Owner-managers	Mkt Technology Status (Checked on 06/03/2017)	Firm uses marketing Technology Status
Firm 01	5 (since Oct 2012)	Small (11 - 50)	2 inactive (different persons) 2 retired	Website: Closed FB: Closed	Website: Information on Products, Green deal FB: Product Advertisements
Firm 07	5 (since 07/02/ 2012)	Micro (1-10)	2 inactive	Website: Sold out FB: Closed	Website: Information on Products, Green deal FB: Product Advertisements
Firm 11	6 (since May 2011)	Micro (1-10)	3 inactive	Website: Closed FB: No FB Twitter: Closed LinkedIn: Closed	Website: Information on Products, Green deal FB: Product Advertisements

					Twitter: No interaction with customers LinkedIn: The basic Information about the firm.
Firm 17	5 (since Oct 2011)	Small (11-50)	1 inactive	Website: Closed FB: Closed Twitter: Closed LinkedIn: Closed	Website: Information on Products and Services, ECO and Green deal FB: nothing on it Twitter: No interaction with customers
Firm 23	5 (since Sept 2012)	Small (11-50)	2 inactive	Website: Closed FB: no FB Twitter: Closed LinkedIn: Closed	Website: Information on Products, Green deal FB: Product Advertisements Twitter: Product Advertisements
Firm 30	4 (since 2012 Nov)	Micro (1-10)	2 inactive	Website: Closed FB: Closed Twitter: Closed	Website: Information on Products and Services, ECO and Green deal

					FB: Product Advertisements Twitter: Nothing on it.
Firm 33	4 (since Aug 2012)	Small (11-50)	1 inactive	Website: Closed FB: Closed Twitter: Closed	Website: Information on Products and Services, ECO and Green deal FB: Product Advertisements Twitter: Nothing on it.

Reflection 1: ESCos that are established with the guidance of Green Deal since 2012 have a tendency to survive in the local markets.

The ESCos, Firm 11 and 17, that established in 2011 and the other ESCos, Firm 01, 07, 23, 30 and 33 that established in mid-2012 show their current firm status as ‘liquidation’ or ‘dissolved’. A common point for these ESCos is that they are established before the publication of the Green Deal policy. Without the direction and guidance of a government energy efficiency policy, these firms failed to demonstrate any expected goal for Green Deal implementation (Department of Energy & Climate Change, 2016). They had built up their own energy efficiency packages and used only the well-known title of Green Deal to sell their products. Consequently, a firm may sell a product that is developed for a large company for the residential community use which comprises of a dozen individual house owners. Evidence of Green Deal ‘scam’ firms have been identified in the newspapers including The Mirror (Penman, 2015), The Guardian (2014 Feb) and BBC News (2014 April; 2013 Dec). Furthermore, BBC

news (2014) for instance reported a local energy service provider selling inefficient products to local Green Deal users which resulted in higher energy costs in the Horsham region.

Reflection 2: ESCOs that sole dependent on Green Deal policy to develop and then provide products and services tend to fail, while those ESCOs that develop their products and services in terms of Green Deal and other green policy, such as ECO, have greater opportunites to survive or growth.

The failed ESCOs were heavily dependent on the Green Deal policy, unlike the firms which survived and more diverse and pursue business opportunities from both the Green Deal and ECO. ESCOs are the key components of the Green Deal implication since they are in charge of the key steps of the house improvement with Green Deal application: assessment and installation. It requires the ESCOs' entrepreneurs and employees have insights into Green Deal policy and its implementation.

However, the explanations about Green Deal on the websites of Firm 11, 17, 23 and 30 are similar: a flowchart that demonstrates how Green Deal functions and the products and services are allowed under the Green Deal scheme. Property occupiers are difficult to understand what the benefits of being the Green Deal users are and what the risks of using Green Deal products. In addition, property occupiers are difficult to know whether their assessment is qualified or not, because the ESCOs have the information exclusively (Gosden, 2017). Furthermore, the insufficient Green Deal funds discourage the interests of the property occupiers and ESCOs managers and few ESCOs even attempt to create new frauds with ambiguous explanations of Green Deal. According to the telegraph news report (Gosden, 2017), unqualified installers turned into the Green Deal providers by getting authorisation as Green Deal participants and,

the UK trading standards agency has received several reports that scammers attempt to disguise as Green Deal providers to scam.


Reflection 3: Failed ESCos did not use digital marketing technologies, such as Facebook, Twitter and LinkedIn, to engage with consumers interactively. On the contrary, these innovative marketing technologies are treated as same as traditional advertisement board to display the product with the price.

The seven failed ESCos did not use digital marketing techniques, including websites, Facebook and Twitter, to display product and service advertisements, which is considered a low and inappropriate use of digital technology for marketing activities based on the usage of successful firms. This highlights the requirement for entrepreneurs and founder-managers to have a good understanding of the functional differences between the website and social media channels, such as Facebook, Twitter and LinkedIn.

Reflection 4: The UK energy service industry is an information-centred industry that requires ESCos to continue to positively provide useful information via their marketing channels, such as website and Facebook page.

Examined the history records of product descriptions and dialogues along with customers on their websites and Facebook pages before they shut down, information that was posted on marketing channels are too simple and general which fail to win the confidence of the consumer. Evidence on the websites of both Firm 07 and 23 shows that their entrepreneurs published information on product function. However, insufficient information of the benefits to the Green Deal users, product price, and testimonials from satisfied customers were not posted. Negative comments left on the Facebook page of the Firm 07 is also a major reason for its bankruptcy.

User 013 left a message about the product installed by Firm 07 as:

“Your boiler is not working !!!  (an emoji: crying face that means disappointment). Can you do something for that. thx”

However, there is no response from the Firm 07 in following 22 days. Then, the User 013 added a further message as:

*“S**t ***. 3 weeks I’ve been waiting for your company to come and repair a title on my roof to get my boiler works again. Your workers blocked my f*****k ventilation in my bathroom for that time. How many times I have called? How many times are your poor excuse of a company going to let me down.. Send your f*****g workers here!!”*

and Firm 07 still no replied about it on its Facebook page.

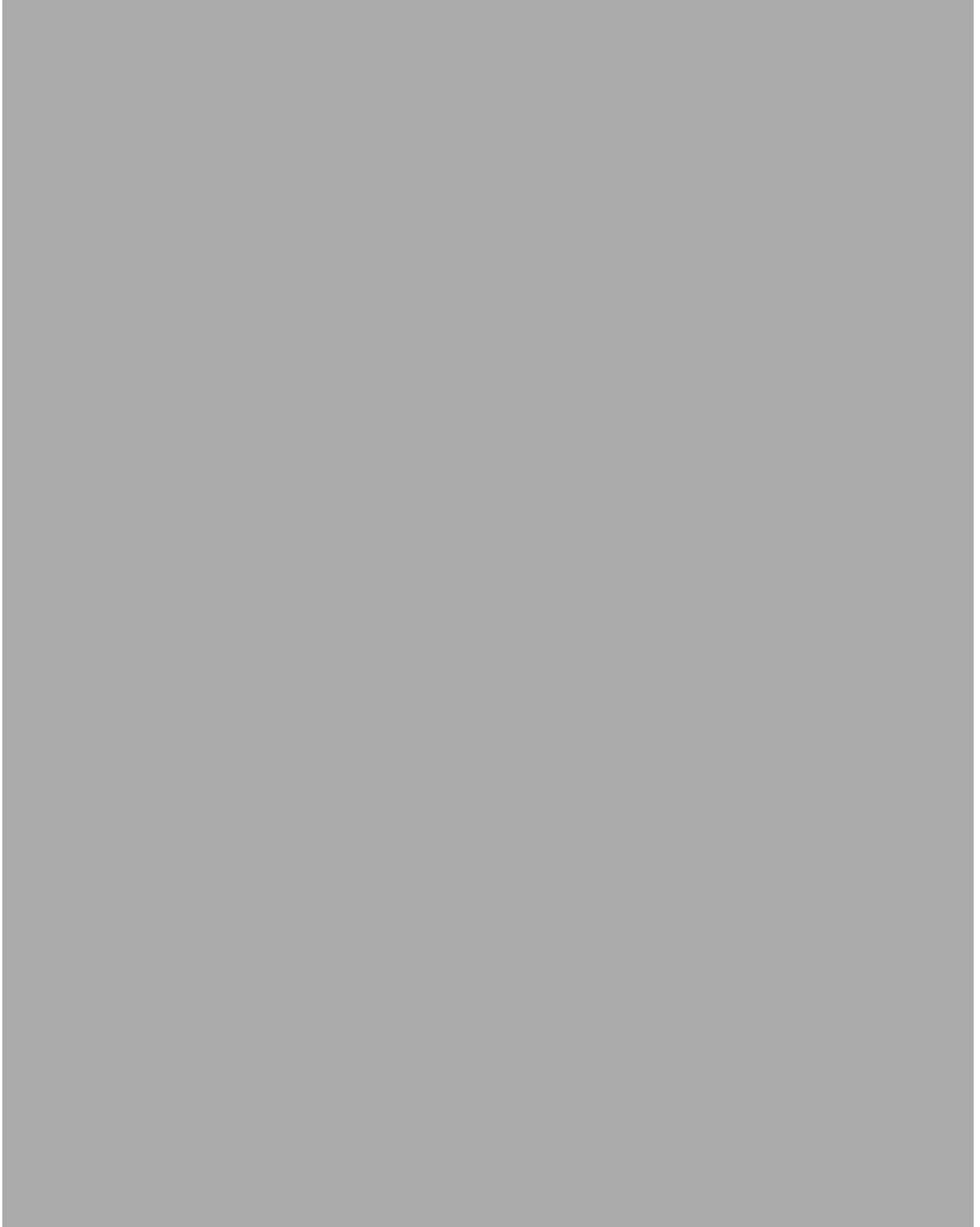
As the consequence, Firm 07 had 61 Facebook users engaged on the Facebook page and there are three consumers who asked about the boiler information or post-purchasing questions before the User 013 left a negative message. While no one attempts to start a conversation after that message and Firm 07 announced the firm status as ‘liquidation’ after four months.

Furthermore, the failed firms do not regularly update their posts on Facebook and Twitter, while the fast-growing firms, like Firms 24 and 25, frequently update their websites, Facebook and Twitter pages.

Madge et al. (2009) claim that Facebook (and other social media) is useful for customer identification and segmentation and may then lead the potential customers to browse the websites or entity stores. Twitter shows a close relationship with e-WoM (Word-of-Mouth) for interaction and communication with consumers (Burton and Soboleva 2011). Additionally, entrepreneurs can use LinkedIn to establish a business network with large energy companies and other ESCos. The government should consider an introduction to marketing channels with a clear expectation of Green Deal into an energy efficiency policy for future.

Appendix D

An Example of New Product Development with Innovation: Six Layer Mesh to keep warm



Appendix E

E-store: an innovative marketing method

All Categories ▾
Q

Wishlist (0)
Compare (0)

🛒 Your Cart:
£0.00

Shop by Department ▾

Home > Shop


Categories

- Electric Fires
- Engineered Wood Flooring >
- Gas Fires >
- IPE
- Jatoba
- Pitch Pine

250 x 114


Shop

Sort by popularity ▾
Grid
List




Eko 1011 LED Electric Fire
EKOPIRES

£299.00



Eko 1050 LCD Wood Burning Effect Electric Fire
EKOPIRES

£649.00





EKO 1060 LED Conventional Electric Fire
EKOPIRES


£299.00


✉ Leave a message


Featured Products

- 


Eko 3090 Gas Fire
£649.00-£769.00
- 

EKO 1060 LED Conventional Electric Fire
£249.00
- 

Eko 1050 LCD Wood Burning Effect Electric Fire
£649.00
- 


Eko 1011 LED Electric Fire
£299.00
- 

EKO 1070 LED Reflections Conventional Electric Fire
£299.00




EKO 1070 LED Reflections Conventional Electric Fire
EKOPIRES

£299.00




Eko 3090 Gas Fire
EKOPIRES

£649.00-£769.00




EKO 5010 Flueless Gas Fire
EKOPIRES

£499.00




EKO 5020 Flueless Gas Fire
EKOPIRES

£499.00



EKO 5030 Flueless Gas Fire
EKOPIRES

£499.00

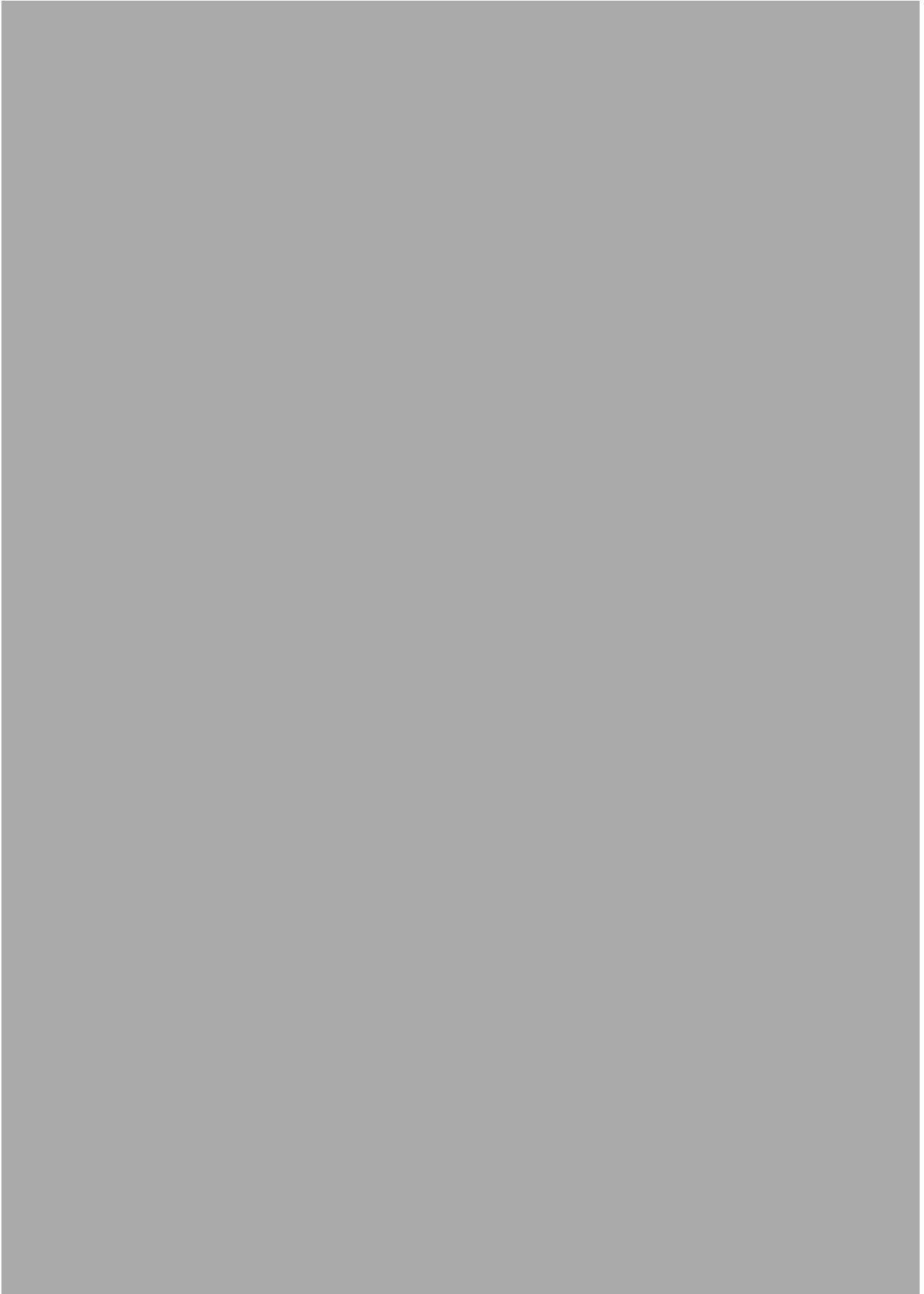


EKO 5050 Flueless Gas Fire
EKOPIRES

£549.00

Appendix F

Key Financial Figures and ESCos' Marketing Performance



Appendix G

An example of Getting Investment from VC

Firm A	120 at £1	ORDINARY D	10.00%
Firm B	120 at £1	ORDINARY C	10.00%
Firm C	600 at £1	ORDINARY A	50.00%
Firm C	166 at £1	ORDINARY B	13.83%
Firm C	46 at £1	ORDINARY C	3.83%
Firm C	46 at £1	ORDINARY D	3.83%
Firm C	51 at £1	ORDINARY E	4.25%
Firm C	51 at £1	ORDINARY F	4.25%

(Part A)

Top Shareholders	Numbers of Shares	Share Type	Ownership (%)
Shareholder A	12.5k at £0.1	ORDINARY	11.39%
Shareholder B	8k at £0.1	ORDINARY	7.29%
Shareholder C	25k at £0.1	ORDINARY	22.78%
Sustain LTD Employee Benefit Trust	14.3k at £0.1	ORDINARY	12.89%
Shareholder D	50k at £0.1	ORDINARY	45.56%

(Part B)

(Source: companycheck [firm 6])

Appendix H

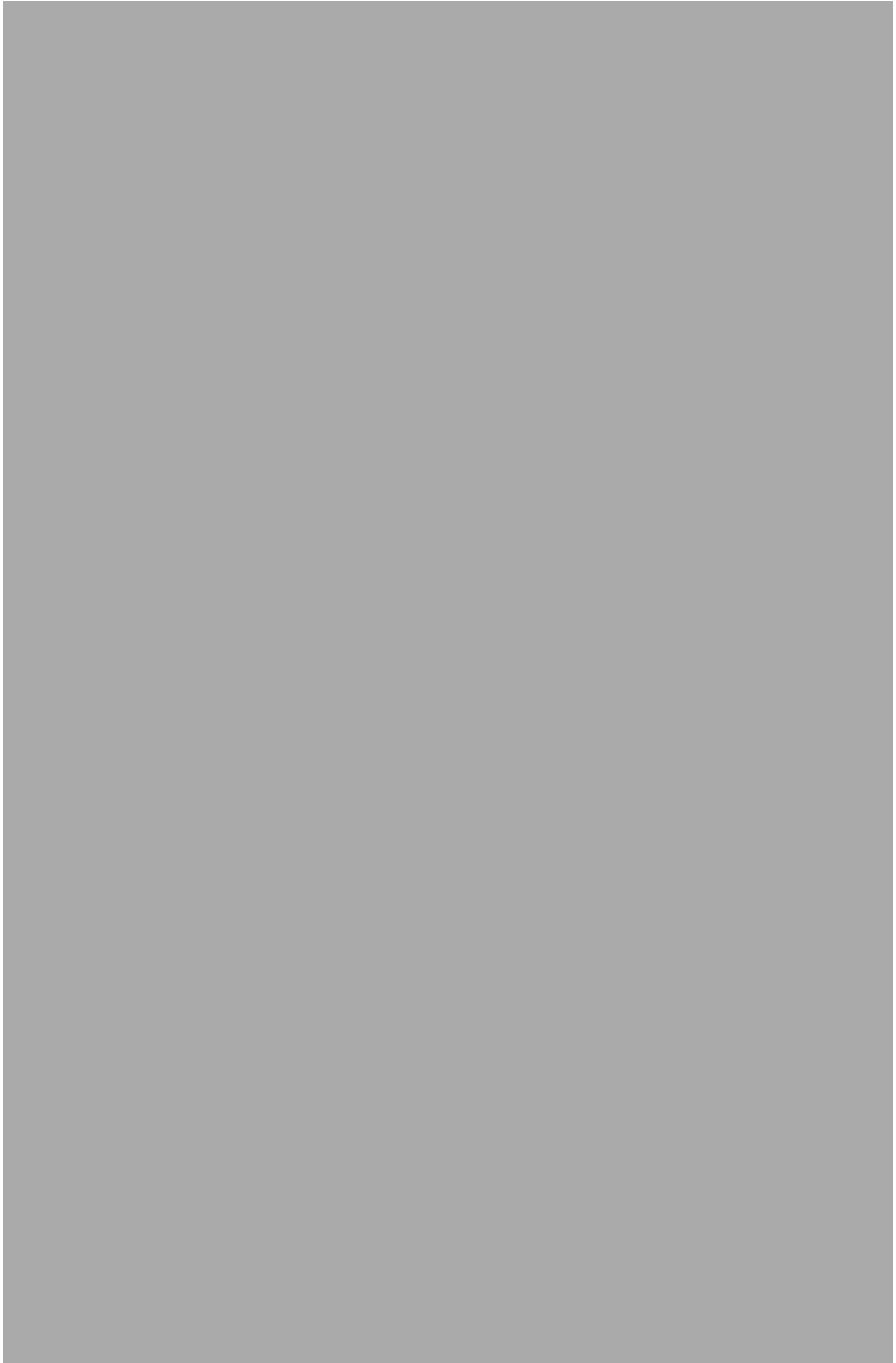
Prevalence Table of Dimension and Sub-dimension

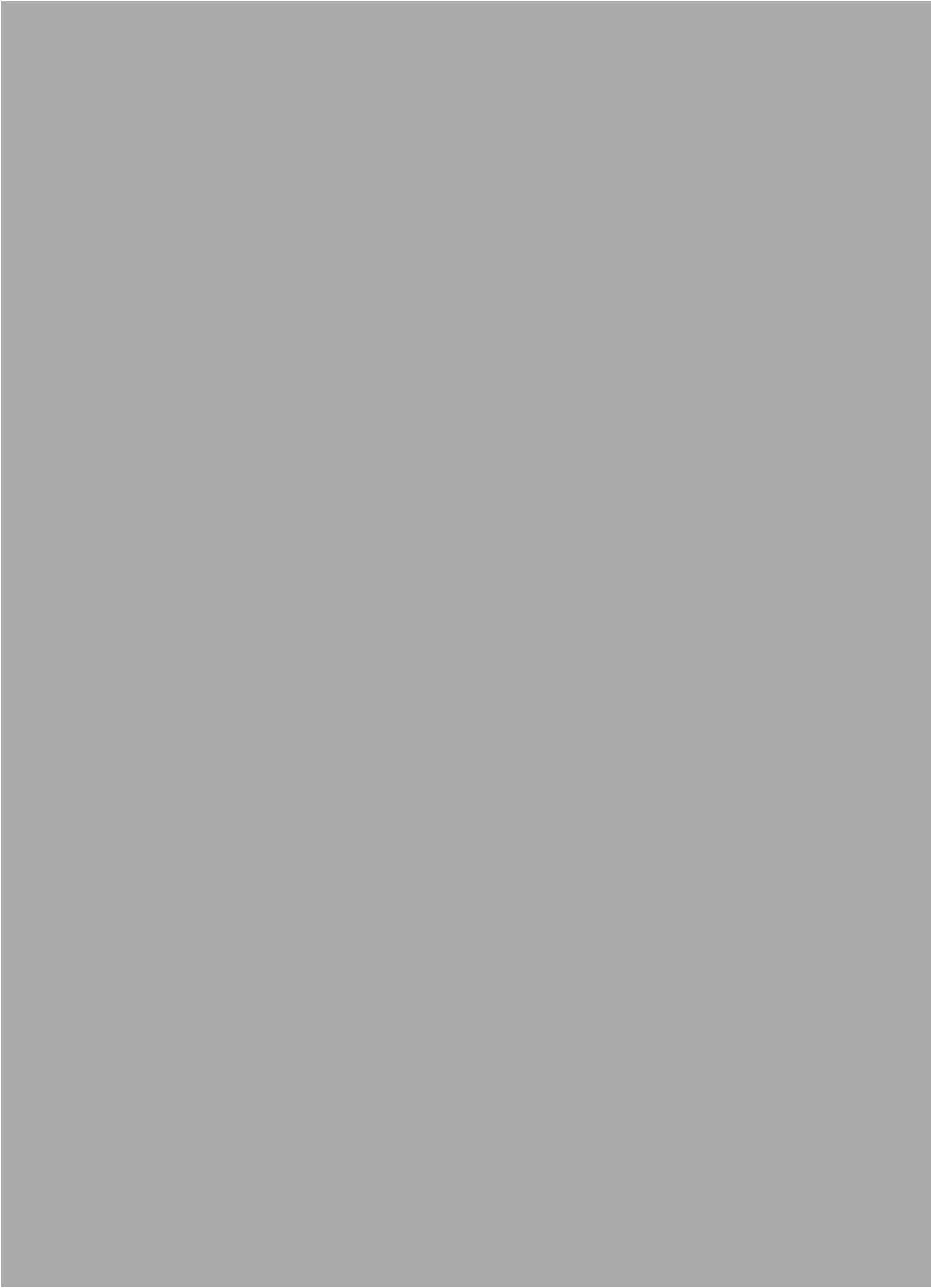
Major Dimension	Sub-dimension	Prevalence	
Entrepreneur's idea and intention (N=25)	Entrepreneurial idea	N=14	41.2%
	Entrepreneurs' intention	N=23	67.6%
Entrepreneurial Orientation (EO) (N=29)	Motivation	N=17	50%
	Entrepreneurial Experience	N=7	20.6%
	Work Experience	N=29	85.3%
	Risk-taking	N=7	20.6%
	Proactiveness	N=6	17.6%
	Entrepreneurial Resources	N=6	17.6%
Market Orientation (MO) (N=24)	Marketing Knowledge	N=19	55.9%
	Networking and Partnership	N=23	67.6%
	Word-of-Mouth (WoM) Marketing	N=5	14.7%
	Administrative marketing	N=21	61.8%
	Direct marketing (one-stop shopping)	N=3	8.82%
	SEA	N=2	5.89%
	International marketing	N=3	8.82%
Technological Orientation (TO) (N=26)	Innovativeness	N=10	29.4%
	Technological Superiority	N=3	8.82%
	Marketing Tool Selection	N=1	2.94%

	New Product Development	N=19	55.9%
	Technology Adoption in Decision-making	N=0	0
	Digital marketing	N=26	76.5%
Customer Needs (N=23)	Customer Identification	N=16	47.1%
	Customer Requirements	N=22	64.7%
	Customer Satisfaction	N=8	23.5%
	Customer Loyalty	N=3	8.82%
Marketing Performance (N=10)	Marketing Performance	N=10	29.4%
Environmental Factors (N=25)	Green Policy	N=29	85.3%
	Environmental Uncertainty	N=7	20.6%
	Venture Capital Investments/ Government Funds	N=14	41.2%

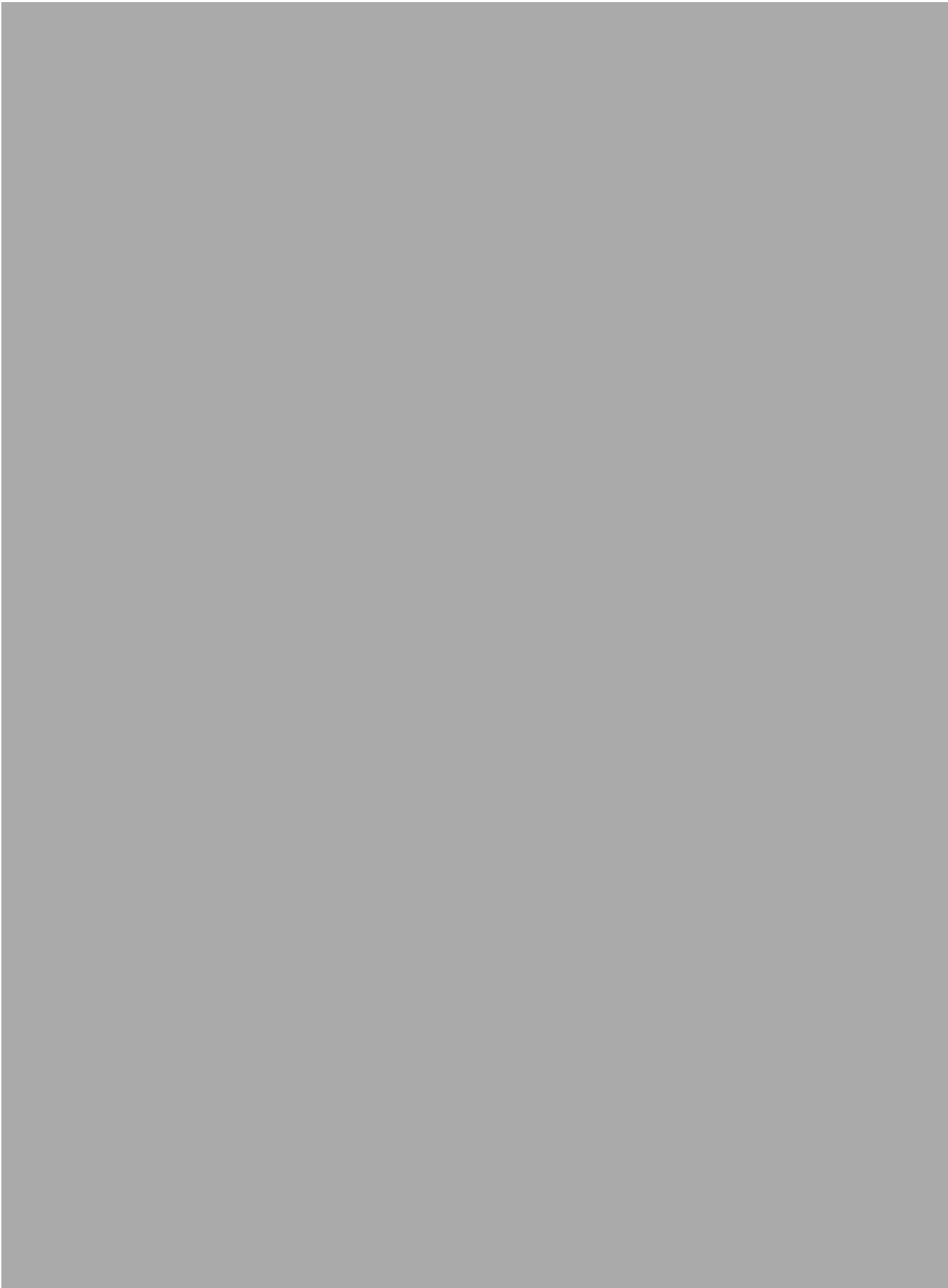
Appendix I

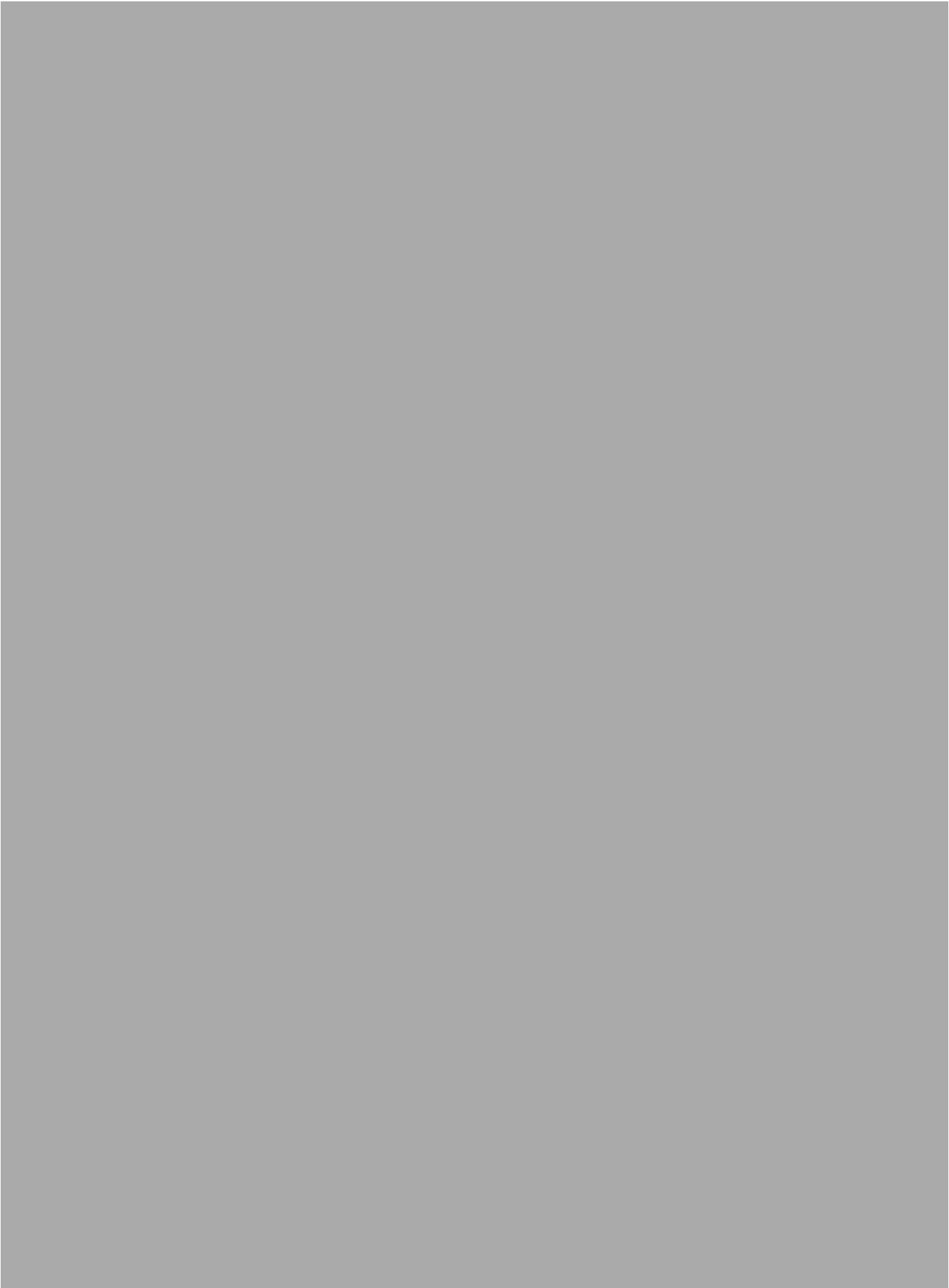
The Interview Question List for the semi-structured Interviews



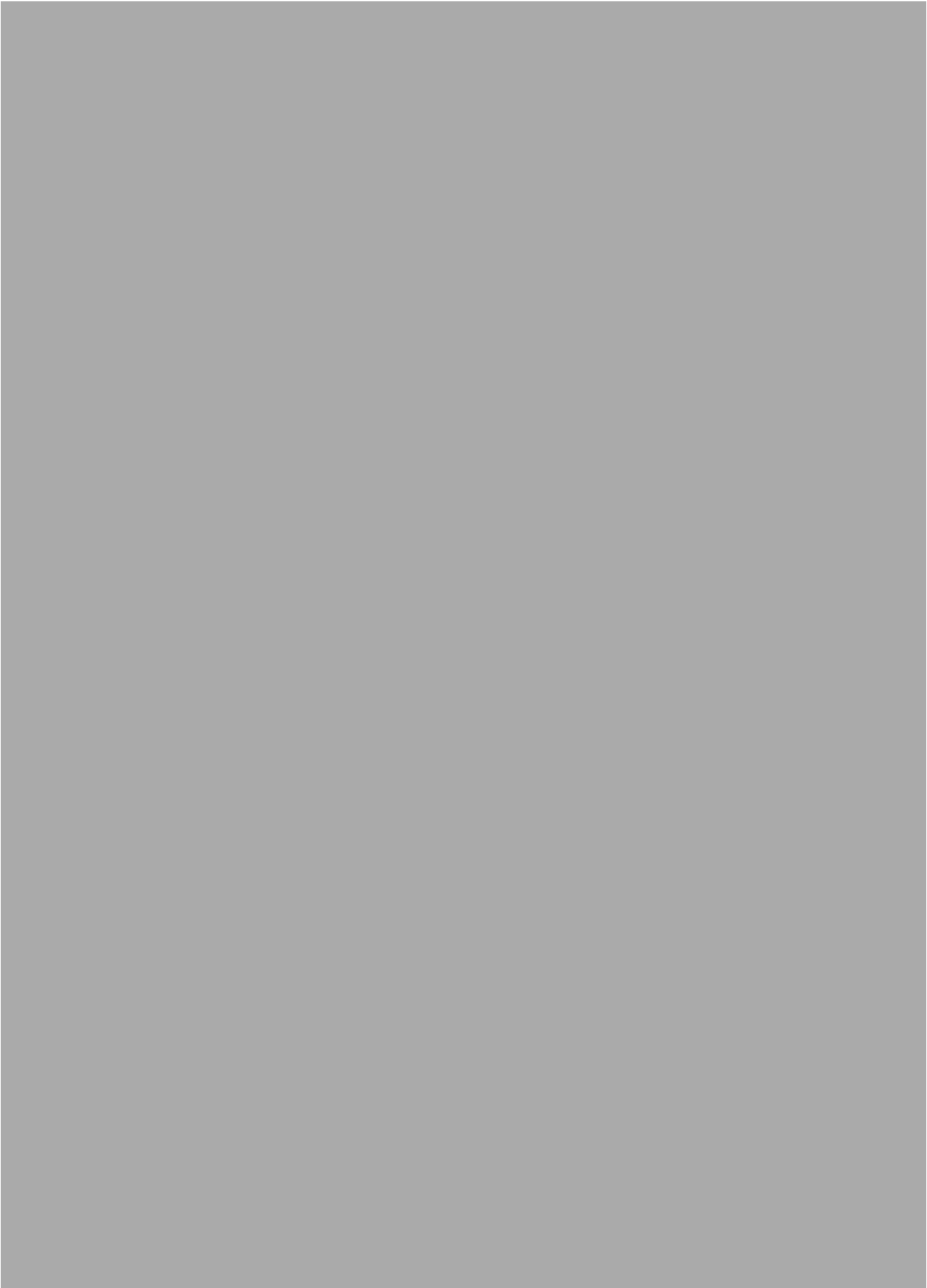














Appendix J

Dimensions of the TEMP model demonstrated with The Secondary Data of Online Non-Participant Observation

