CRANFIELD UNIVERSITY

A FAIERS

UNDERSTANDING THE ADOPTION OF SOLAR POWER TECHNOLOGIES IN THE UK DOMESTIC SECTOR

SCHOOL OF APPLIED SCIENCES

PhD THESIS

ACADEMIC YEAR 2008-2009

Supervisors Dr. Charles Neame and Dr. Matthew Cook

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Abstract

The aim of this thesis was to provide new insights into the adoption of solar power technologies. Policy has identified solar technologies capable of providing domestic carbon reductions but limitations such as high capital costs and poor productivity are preventing widespread adoption. The research problem was that neither the attitudes of householders to the technology, nor their adoption decision processes had previously been investigated. If these could be understood, policy interventions might be more effective.

This research presents previously unseen adoption curves for solar power systems, which by volume are less significant than conventional energy efficiency technologies, but the ‘S’ curve shows a rate of adoption similar to insulation and boiler systems. In addition, this research presents a comprehensive set of constructs that householders use as heuristics in their decision making process. These constructs were used in a survey of householders that showed both innovative and pragmatic tendencies in order to gain insight to their attitudes towards the systems.

The results of this survey highlighted that adopters are mostly positive to solar power systems, especially the environmental aspects. However, on aesthetic, operational and financial issues, the responses indicated less positive attitudes by the ‘pragmatic’ majority. The survey confirmed the presence of a previously theorised ‘chasm’ that demonstrated significant differences between earlier and later adopters. This highlighted seven aspects of the technology that developers should consider, and also a difference in the decision making process followed by the two sets of adopters. Policy insights are discussed in relation to this.

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Publications

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Abbreviations

DTI	Department of Trade and Industry
BERR	UK Department for Business, Enterprise and Regulatory Reform
DEFRA	Department of Environment, Food and Rural Affairs
UNPCC	United Nations Panel on Climate Change
DDC	Daventry District Council
NHEEP	Northamptonshire Home Energy Efficiency Partnership
ST	Solar Thermal
PV	Solar Photovoltaic
EU	European Union

Table of Contents

List of Figures

List of Tables

1 Introduction

The aim of this thesis was to provide new insights into the adoption of solar power technologies. This introduction identifies the research problem and presents the background issues that are associated with it. In addition, this introduction details the structure of the thesis, which follows a conventionally academic process of a literature review followed by methodology chapter, presentation of the primary investigation and its results, and is completed with a discussion chapter and conclusions.

1.1 Background to the Research Problem

In 2003/4, there were a total of 20.6 million households in the United Kingdom (UK), of which 14.6 million were in owner occupation (DTI 2005a). The source of the energy used to satisfy the energy demand from the domestic sector is predominantly carbon fuels, such as gas, or electricity generated in large scale power stations, which directly contribute to carbon emissions and lead to climate change (DTI 2003). In 2004, domestic energy demand accounted for just over 30% of the national energy demand, which was an increase of 18% (DTI 2005).

The Royal Commission on Environmental Pollution (RCEP) advocated targets set at the 1992 Kyoto Protocol that the United Kingdom should reduce its energy use by 12.5% by 2010 and further recommended that carbon emissions should fall to a new level of 60% below that of 1998 levels by 2050 (Clift 2005). Further demands on the UK policy have also been made; '*In March 2007, the European Council committed the European Union (EU) to a binding target of reducing greenhouse gas emissions by 20% by 2020 and by 30% in the context of international action. The agreement commits* *the EU, amongst other things, to a binding target of a 20% share of renewable energies in overall EU consumption by 2020'* (DTI 2007).

As part of an ongoing programme of energy management, the UK government set out its Energy Policy in a White Paper in 2007, opting to promote a low carbon economy. The paper set out the strategy for achieving the overall goal of better energy productivity, which was to firstly save energy, then to develop cleaner energy supplies, and thirdly, to secure reliable energy supplies with prices set in competitive markets (DTI 2003). In respect of domestic energy efficiency and micro-generation, the 2007 Energy White Paper sought to increase consumer awareness through information channels including metering, codes of practice and visible house building standards with associated information and energy ratings. Micro-generation technologies, including domestic applications of solar power technology were proposed as sources of heat and distributed energy and that the spatial planning regime would be relaxed to facilitate their installation (DEFRA 2008).

The current market for domestic level renewable energy systems shows that Domestic Solar Hot Water and Photovoltaic technologies have not penetrated the market sufficiently so as to become significant in annual market reports such as Mintel (2005). In 2001, the equivalent of 6.8% of total energy generation was produced by renewable technologies, but only 1% of this was generated with active solar technology (BERR 2008). Recent reports suggest that as of 2004, 82,200 solar systems had been installed in domestic properties in the UK, with at least 95% of these being solar thermal systems (Caird et al. 2008). This is a nominal amount compared to the market for conventional energy efficiency technologies such as thermal insulation products, central heating and double glazing, the market value of which was worth £5,783, 000 in 2005 (Mintel 2005) . The relatively low adoption of renewable energy technologies compared to conventional energy efficiency technologies thus appears slow, in part due to three factors; high capital cost, legislative barriers, and low levels of awareness (Caird et al. 2008).

A report to the Department of Trade and Industry (Djapic and Strbac 2006) made a number of recommendations regarding factors that would affect the future adoption of renewable energy technologies; they recommended reviews of the current distribution system in order that it could adapt to future technologies and also that tariffs paid to producers be reviewed in light of future renewable sources. In 2008, the UK government launched a consultation programme in order to gain views on how the UK should meet the target to generate energy from renewable sources, stating that '*it will require a ten-fold increase in the level of renewable energy generation and use in the UK over the next 12 years'* (BERR 2008a).

1.2 Research Problem

The aim of this thesis was to provide new insights into the adoption of solar power technologies. This aim has been set because there is a clear policy problem; current UK Government Policy is to '*see renewables grow as a proportion of our electricity supplies to 10% by 2010, with an aspiration for this level to double by 2020* (DTI 2007), however, the contribution of renewable power remains at 7% of the total renewable energy generated, and solar power technologies contribute only 1% of the total energy mix (BERR 2008). It is recognised within UK policy that domestic level micro-generation systems will not significantly reduce carbon emissions but the policy still seeks promotes the concept of ‘zero’ carbon emitting homes that use micro-generation technologies (DTI 2007 pp12).

Therefore, a research problem exists, which if understood, could be helpful to resolve this policy problem. The literature review highlights that energy research has not sought to understand the attitudes of householders to solar power technologies; in respect of either their attitudes to the technology or their decision processes when adopting the technology. If the attitude of householders could be understood, this could facilitate the achievement of targets set for the current policy of increasing the use of micro-generation technologies, and in particular solar power technologies.

This research complements other work carried out, such as Jackson (2004) and Caird et al. (2008) in that it extends previous research that has informed UK policy regarding energy and sustainable development. In particular, this research focuses on the role of householders as consumers as opposed to corporate or commercial applications for solar technologies. This is necessary to understand if the policies demanding an increase of the adoption of domestic level micro-technologies are to be successful.

1.3 Research Aims and Objectives

The research problem is outlined above as a need to understand the attitudes of householders to solar power technologies; in respect of either their attitudes to the technology or their decision processes when adopting the technology. Therefore, a research aim has been set, with a supporting series of objectives that will enable its achievement. Objective 1 was achieved through a review of the literature (Chapter 2) and as a result of the findings of the review, the remaining objectives were articulated (see the conclusions of the Literature Review: Chapter 2). The methodology for achieving the objectives is described in the Methodology (Chapter 3).

Aim

To provide new insights into the adoption of solar power technologies

Objectives

1. To identify theories of technology adoption which will enable the adoption of solar power technologies in the UK domestic sector to be assessed in a new light
2. To identify differences in the rate of adoption between energy efficiency and solar power technologies in the UK domestic sector
3. To identify the heuristics that consumers use in their adoption decisions regarding solar power technologies
4. To explore whether or not a chasm exists between earlier and later adopters of domestic solar power technologies
5. To identify policy relevant insights into the adoption of solar power technologies in the UK domestic sector

1.4 Scope of the thesis

The scope of this thesis was the adoption of solar power technologies by the UK domestic sector. The thesis was carried out over the time period 2002-2009. The scope for the thesis was in part dictated by Daventry District Council, who was the funding agency for the thesis. The research was initiated from a project that sought to promote the use of Solar Thermal and Photovoltaic systems to domestic users. The project, titled SolarPlan was managed by Daventry District Council who had gained funding as part of its legal requirement to promote home energy efficiency.

The SolarPlan project was one of a series of three projects that operated simultaneously, but was the least successful in achieving the aims for which it had been funded. In 2001, the first year of the project operation, it became apparent that the project was not going to realise its aim of installing 160 systems, so the decision was taken to investigate the reasons behind the lack of interest from householders.

The focus of the thesis was on the attitudes of householders to solar power technologies as opposed to the creation or development of the systems, or the diffusion or marketing of the systems. It is important to note that the criteria of the funding agency was not to focus on market research in order to sell more systems, but to understand the issues that were seeming to prevent the adoption of solar power technologies by householders. Hence, this thesis draws on the literature from both consumer behaviour and innovation disciplines.

Once completed, the results were made available to the SolarPlan management team and also the Energy Savings Trust. It is important to note that whilst the SolarPlan project had a vested interest in the results of the thesis, particularly the results of data analysis, the project had no involvement in the setting of the research aims or agenda for this thesis, nor did its managers intervene in the direction of the research. However, the association with the funding organisation did lead to some limitations that are discussed in chapter 5.

Two key assumptions are made for the purposes of this thesis:

- For the purposes of the thesis, householders have been assumed as, and are referred to as consumers as a majority of behavioural literature has been centred on consumers.
- Despite solar thermal and photovoltaic technologies being established technologies in their own right, they are assumed to be innovative technologies as they are new to the market place in the UK on a large scale .

1.5 Structure of Thesis

In order to present this thesis in a logical order, it has been divided into five further chapters.

Chapter 2: Literature Review

The review of the literature pertains to the adoption of solar power technologies and draws together salient aspects of relevant consumer behaviour theories. As a result of the review, objectives are set for further research.

Chapter 3: Methodology

This chapter explores and critiques possible research methodologies, in order to develop an appropriate methodology for this research programme. The strategic purpose and design of the research is detailed, including the method, data collection and analysis. Consideration is given to construct validity, internal and external validity and reliability.

Chapter 4: Case Study

The case study was carried out in sections covering the scope and context of the Daventry District Council projects and the analysis of the data and results.

Chapter 5: Discussion

The discussion chapter provides a critical review of the research programme, including a discussion of the findings from the case study. This includes a comparison of the findings to the literature, an evaluation of the methodology and issues that could affect the value, reliability, and validity of the final research outcomes.

Chapter 6: Conclusions

This chapter summarises the extent to which the aim and objectives have been met. It also highlights the contribution of this thesis to substantive knowledge. In addition, some recommendations for further research are presented.

This introduction chapter has introduced the thesis in order to give readers a clear understanding of what to expect. As noted above, the research process began with a review of the literatures.

2 Literature Review

The review of the literature pertains to the adoption of solar power technologies and draws together salient aspects of relevant consumer behaviour theories. As a result of the review, objectives are set for further research.

The objective of this literature review is to identify theories of technology adoption which will enable the adoption of solar power technologies in the UK domestic sector to be assessed in a new light. This chapter commences with a review of the literature concerning solar power technologies and continues with a broader review of theories associated with consumer behaviour and the adoption of innovations.

2.1 Background to Solar Power Systems

There are two types of solar technology; 'Photovoltaic' systems (PV) which convert light energy to electricity, and 'Solar Thermal' systems (ST) that utilise solar thermal energy to heat water which is then typically used for washing within the household. Benefits of solar power systems are that they can provide a proven source of energy using a clean technology that has no emissions in operation. They can be readily used in urban environments as they require no additional land use, and they can offer the opportunity for householders to make a statement about their environmental belief (BRECSU 2001).

Photovoltaic systems cost between £4,000- £9,000 per kWp (installed) whereas solar thermal systems cost up to £4,000 installed. Opportunity costs such as roof re-working can be used to offset additional installation costs such as scaffolding. Either system will typically only save £125 per annum, which may make them uneconomic for many households in simple terms such as Capital cost vs. Revenue return (BRECSU 2001).

The literature concerning the adoption of domestic solar power systems is limited and typically paints a pessimistic picture of the potential for solar power systems; it is a mature technology that is being pushed by policy but has failed to be adopted as it is too expensive (ETSU 2001) and while solar power systems are attractive at a national or policy level as a means of reducing carbon emissions, they remain unattractive to individual householders (Timilsina 2000). Research has already suggested that to be attractive in simple financial terms, solar technologies would need to cost approximately £1000 at 2003 UK prices (BRECSU 2001).

PV systems are seen as an affordable technology at a commercial level, but are incompatible with personal priorities and unfortunately, ‘compatibility’ is a basic criterion of a consumers ‘willingness to pay’ for the technology (Berger 2001). ST technology is seen as a mature and proven technology and barriers to widespread adoption include long payback periods for the householder, high capital costs and a lack of confidence in the long-term performance of the systems (ETSU 2001; Timilsina 2000). Unsurprisingly therefore, unless electricity prices rise, or commercial schemes reduce overhead marketing costs, or new inventions develop more efficient panels, the use of the technology will be uncompetitive with conventionally produced electricity (Luque 2001).

Kaplan (1999) showed that the adoption of renewable energy systems often requires extensive research and deliberation by the householder, and therefore, marketing activities that increase familiarity such as offering small-scale PV goods such as radios, calculators and lamps are beneficial. This concurs with other recommendations (e.g. Aggarwal 1998, Bolinger et al 2001) to develop greater awareness through customer education programmes, marketing material, and information about processes involved, including disruption that may occur during installation or operation. Utility companies could further incentivise the systems by providing generous prices for energy produced by householders (commonly known as a buy-back) thus reducing the time for a householder to recover the cost of the technology and installation (Bolinger et al. (2001) Specifically, householders need information such as descriptions of the technology, methods of operation, and their overall performance with regard to energy savings and environmental benefits (Lai 1991; Latacz-Lohmann and Foster 1998; Berger 2001; Tsoutsos 2001; Vollink et al. 2002; Karagiorgas et al. 2003).

Caird et al's (2008) investigation into the adoption of energy efficiency and renewable energy technologies confirmed much of what has been documented in that the barriers to adoption of renewable technologies are mostly financial, as well as some practical issues regarding installation and general levels of knowledge. However, it is not clear that even if the costs were reduced and information made more available that adoption levels would increase. Neither is it clear that if an increase in adoption were to occur that it would lead to reductions in carbon emissions due to the effect known as the 'Rebound' effect (Caird et al 2008). The rebound effect describes the phenomenon where individuals divert their spending onto equally carbon rich activities as soon as they have saved money on another; for example by spending money that has been saved as a result of energy saving in one area, on energy intensive appliances that might be perceived as improving their quality of life, for example a larger more energy intensive television (Herring 2006).

Despite the criticisms of domestic level solar power technologies, some householders are adopting the technology (BERR 2008). The literature does indicate areas of research that could be pursued if a more rounded view of the adoption of solar power systems is to be gained. Hence, a broader review of the literature concerning the adoption of innovations was undertaken and is introduced in the following section.

2.2 A broader review of the relevant literature

Whereas the literature concerning solar power technologies focuses on either the technology or market research topics, there is a broader literature relevant to consumer behaviour. A useful example is a particular review in which models of decision making, precedent and antecedent conditions are discussed against a paradigm of sustainable consumption (Jackson 2004). These models are discussed against a framework as illustrated in Table 1, below.

Researchers have often used models to predict behaviour, although there may be limitations and criticisms if the researchers are not pluralist and are seen to rely on one approach (e.g. Van den Bergh 2000 and Schotter 2006). For example, Lavoie (2004) argues that consumers appear to utilise principles that occur in a priority order, on which they make proceduralised choices relative to their needs. This procedural approach asserts that consumers have rules that allow them to make decisions. These rules are based on non-compensatory procedures, accounting for criteria that are important to the individual. Hence, if the criteria are those of the individual, then their needs are satisfied and they proceed with the purchase (Lavoie 2004).

Table 1. An overview of models of consumer behaviour (after Jackson 2004)

Category	Examples of Model
‘Rational Choice’	Consumer Preference Theory Attribute (Lancaster) Model
Against ‘Rational Choice’	Bounded Rationality Moral Critique
Adjusted Expectancy Value	Simple Expectancy Theory Means End Chain Theory Theory of Planned behaviour Theory of Reasoned Action
Moral and Normative Conduct	Ecological Value Theory Norm Activation Theory Sterns Vale Belief Norm Focus Theory of Conduct
Habit	Cognitive Effort Habit and Routine Framing, Priming and Bias
Sociality and Self	Social Symbolic Cognitive Dissonance Social Identity
Integrative Theories	Attitude-Behaviour-Context model Triandis Theory of Interpersonal Behaviour Motivation Opportunity Abilities Bagozzi’s Model of Consumer Action

The challenge therefore for further study of consumer behaviour is to understand what the criteria actually are. Hence, this section focuses on reviewing critical issues that can affect behaviour and decision making. In summary these are:

- Rational Choice
- Values, Attitudes and Perceptions
- Learning and Cognition
- Cognitive consistency and dissonance
- Social influences

The following sections discuss the impact of each of these issues on consumer behaviour.

2.2.1 Rational Choice

Rational Choice is an economic paradigm that models consumers as constrained maximisers, where individuals are seen as rational because they solve a theoretical mathematical optimisation problem and choose accordingly (Koppl and Whitman 2004). In general, rational choice assumes that preferred choices will be those that provide the greatest reward at the lowest cost (Lovett 2006). The theory of rational choice is a central tenet to many models of consumer and adoption behaviour e.g. the Theory of Reasoned Action (1975), the Theory of Planned Behaviour (1986) (reviewed by Jackson (2004)), the Diffusion of Innovations theory (Rogers 2003), and the model of use and adoption of renewable energy systems by Caird et al (2008).

However, rational choice is not without criticism. The results of studies using rational choice paradigm are criticised as having failed to provide a significant set of non-obvious, empirically sustainable propositions about political behaviour (Shapiro 2005). Criticisms include that theories of rational choice are limited because a multitude of methodological assumptions are required, for example a discrete purposeful actor exists and that the actor is expected to assess all the choices and decisions (utility),ultimately choosing the option that optimises utility (Green and Shapiro 1994; Lovett 2006).

Further criticisms of rational choice posit that consumers incorporate non-economic features into their decision making process (Yang and Lester 2008; Rios 2006; Vatn 2005). Simon (1957) argued that '*in decision-making situations actors face both uncertainties about the future and costs in acquiring information about the present. These two factors limit the extent to which rational decision- making is possible*' (cited by Jackson 2004).

Within the theories of rational choice, there are two views of decision making; a view of perfect rationality, and a view of bounded rationality (Haugtvedt et al.2005). Perfect rationality assumes that consumers have access to all available information, which informs a decision of whether or not to adopt. Examples of this might be the simple model of Consumer Preference (reviewed by Jackson 2004), which describes the influence of tastes, costs and benefits on the behaviour of consumers. More complex models, such as the Attribute (Lancaster) Model of 1966 consider the utility of products and how these add value.

Bounded rationality, on the other hand, recognises that the information available to consumers is often limited due to internal factors, such as cognitive capability, or due to external factors, for example, lack of product information (Haugtvedt et al. 2005). Where decisions are 'bounded', consumers will work with heuristics or 'rules of thumb', which are proposed as requiring less cognitive effort to work with (Elster 1977; Haugtvedt et al.2005). On the basis of research, San Miguel et al. (2005), Lehtinen and Kuorikosi (2007), and Koppl and Whitman (2004) similarly suggest the inclusion of rational choice hermeneutics into the process of interpreting situations because heuristics provide description to a situation and how individuals have orientated their responses to it.

Yang and Lester (2008) argue that consumers mostly follow a bounded rationality, due to a phenomenon of Behavioural Irrationality, which suggests that individuals have limited ability to make rational decisions due to medical impairment, low levels of intelligence, or because they are elderly or from lower social classes. This is a controversial way of presenting this particular conclusion although there is a wealth of research that demonstrates the effects of social class on education outcomes (e.g. Hansen 1997), on health (Marmot 2005) and on decision-making (Dubrovsky et. al. 1991).

As will be discussed below, the influence of values, attitudes and perspectives influences the choices that individuals make; and the literature suggests that individuals will be more greatly influenced by some characteristics of products depending on their own values (e.g. Hansen 2005; Huber et al. 2004). Simon, who first proposed the model of Bounded rationality (1957) later asserted a procedural rationality that distinguishes between the actual choices made by an economic actor and the manner (context) in which it was made (reviewed by van den Bergh et. al (2000)). Further to this, Simon proposed that the fundamental principle of bounded rationality was a compound of satisfaction and 'optimising' that was labelled 'Satisficing'. This compound differs from the paradigm of rational choice where individuals are understood to be trying to optimise choices; in that 'Satisficing' is the process of minimising costs and achieving a positive decision outcome. Simons' proposal of 'satisficing' has been reviewed extensively with resulting acceptance (see Yang and Lester (2008); van den Bergh (2000); Jackson (2004); Lovett (2006)).

The theory of Reasoned Action proposes that 'intention', which is a cognitive representation of an individual's behavioural tendency, is the best predictor of individual behaviour. 'Intention' is influenced by internal and external control constructs, such as needs, values, attitudes and perceptions and hence, is seen as a function of the individual's attitude toward behaviour and any subjective norms (reviewed in Jackson 2004; Shaw et al. 2005; Smallbone 2005).

The theory of Planned Behaviour extends this model to include the process of perceived behavioural control over the subjective norms and the intentions of the consumer, as well as the consumers' behaviour (Ajzen 1991). Although first documented in 1985, a review of the theory of planned behaviour by Ajzen in 1991showed that since the theory had been first proposed, there was a growing amount empirical support for it. Ajzen identified a need for the theory from the problem that an individuals' general disposition was often a poor indicator of actual behaviour, and further, that empirical research lacks support for a strong relationship between personality traits and behaviour in specific situations.

Other models indicate that multiple factors are involved in consumption behaviour; for example, Giddens' Agency Structuration theory (1984) reviewed by McDonald et al. (2007) demonstrates the role of multiple agencies on decision and consumption behaviour. Giddens' emphasises *'freedom and rationality, but consumer identities are multiple and contested and subject to a regulatory framework of cultural norms and social expectations'* (cited from McDonald et al 2007). Further to this, the Attitude-Behaviour-Context (ABC model by Paul Stern 2000) describes how contextual factors will influence attitudes and behaviours, while the Triandis model of choice behaviour (reviewed by Sheth 1982) adds the element of consumer's habits to the ABC model. The Motivation-Opportunity-Ability (Thorgesen and Olander 1995) recognises that predictability was only apparent when volitional control could be applied by the actor; The Bagozzi model of 'Consumer Action', which is based on the ideal of 'Trying' and includes components such as normative beliefs, cerebral aspects such as emotions, goal intention and feasibility, behavioural desire, and also moral values and standards. Kidwell & Jewell (2003) established through research that an antecedent relationship exists between internal and external control influences, with external control as an antecedent and internal control as the more proximate determinant of behavioral intent. Hence, if external influences are antecedent to a decision, then the subjective norms of the social environment will affect choices made by individuals (Stern et al 1999).

2.2.2 Values, Attitudes and Perceptions

Values are centrally held cognitive beliefs that will guide and stimulate behaviour (Stern et al. 1999; Chiu 2005); for example self respect, or the maintenance of good health. Schwartz (1977) (cited in Stern et al 1999) developed a topology of values where ten types of value aggregate into four broadly thematic cluster types. These clusters describe values based on Universalist values, where altruism, justice and human rights prevail; Conservative values, where tradition and security ensue; Egoistic values, where the individual is concerned about one's self; and finally 'Openness to change' values, where the individuals are less rigorous in their view. These four categories can be simplified further, to either self-transcendent values, whereby the individual emphasises the acceptance of others as equals and demonstrates concern for society at large, or self-enhancing values, where the individual is in pursuit of one's own relative success and dominance over others.

Kanuk and Schiffman (1997) define attitudes as '*a learned disposition to behave in a consistently favourable or unfavourable way with respect to a given object*'. In this definition, the 'object' could be the subject of adoption, and the 'dispositions' would be learned by exposure to media, peers or past experience with the innovation. The attitude formation process is defined as following a process of rational choice, whereby cognitive processes of knowledge gathering precede evaluative assessment, and finally actual adoption of attitudes occurs; these attitudes enable the individual to maximise their benefits and minimise costs.

Individuals will generate perceptions of constructs situations and behaviours, which in turn can influence their own behavioural intention (Kidwell and Jewell 2003). Historically, the study of perceptions has been used in marketing research to form the basis for studying motivations and attitudes (Lusk 1973; Auty and Elliott 1998; Hsu et al 2000), and also consumer behaviour, and innovation adoption (Coulson-Thomas 1991; Chisnall 1985; Kotler 2003; Schiffman & Kanuk 1997).

Hansen (2005) summarises that consumers perspectives when choosing of products and situation fall into four categories; namely ‘value’, ‘information processing’, ‘emotional’, and ‘cue utilisation’. The ‘value’ perspective is the overall assessment of utility based on what individuals give for goods, and what they receive in turn. The ‘information processing’ perspective changes depending on how involved the individual may be with the goods in question. Highly involved individuals (individuals very keen to consume the products) will need to avoid dissonance with the resulting decision by justifying their decision with their beliefs and attitudes (‘emotional’). On the other hand, individuals with a low level of involvement with the products will judge the performance of goods on cues (‘cue utilisation’), such as price. (Hansen 2005; Huber et al. 2004). Hansen (2005) recognises that these four perspectives are not mutually exclusive, but complementary to each other and form the basis of understanding choice.

Bems 1972 Self-perception theory (cited by Verhaul et al.2005) states that individuals realise their own attitudes, emotional and ‘other’ states, by inferring them from observations of their own behaviour and the circumstances in which it occurs. This is important as it shows that perceptions are borne from a range of aspects. Hence, as well as cognitive perspectives influencing the decision making process such as how the individual values the goods other cues such as perceived quality, the individual can be affected emotionally. This further strengthens the case for decisions being made within an environment of bounded as opposed to perfect rationality.

Stern et al (1999) found that non-activist support for environmental improvements was based on the three dimensions of: 1) environmental citizenship; 2) consumer behaviour; 3) policy support, and within each of these three dimensions, personal pro-environmental norms were a common factor. In testing this theory, the causal links in value-belief-norming theory were concluded to be the best theoretical account for these three dimensions. These findings are compatible with Maslow's Hierarchy of Needs (Brugha 1998), whereby 'Needs' can be categorised, although this is done on an individual basis and individuals will allocate how much of their budget they are willing to spend within categories using their own reasonable judgement. Hence, some categories will be subordinate to others, based on the principle of irreducibility. Irreducibility describes the principle that needs are separable and sub-ordinate (see Georgescu-Roegen's (1954) Principle of Irreducibility cited in Lavoie 2004).

Psychographic factors, for example, altruism, have been identified as factors that can differentiate consumer types. Altruistic behaviour, or a desire to help others regardless of the internal cost, arises where an individual has adopted the perspective of another, feels empathy and seeks to reduce the other party's needs (Straughan and Roberts

1999). This is different from other psychographic factors that may be motivated by either punishment avoidance or reward seeking (Lee and Holden 1999).

Past research on factors that influence consumers' willingness to pay for goods has shown that attitudes are excellent predictors of environmentally friendly behaviour (Laroche et al. 2001). This may be enhanced if manufacturers provide evidence that their products or services support environmental claims, demonstrable through such schemes as accreditation to standards (Vlosky et al. 1999) but there may still be limiting factors, such as premiums set too high (Salmela & Varho 2005). Also referred to as 'Social-psychological antecedents', attitudes have been identified as a key determinant of environmentally conscious behaviour (Stern 2000); attitudes such as environmental concern, political orientation, and in particular perceived consumer effectiveness (PCE) have been proven to be causal links to behaviour (Roberts 1996; Lee and Holden 1999).

However, Jackson (2004) points out that an attitude-behaviour gap exists, citing examples where individuals who had stated intentions to pick up litter, then avoided strategically positioned litter near to the point of interview! Hence, the critical issue remains that consumers do not always purchase products despite their stated intentions to do so. McCalley (2006) found that individuals who know more about an issue spend time planning adoption, but do not necessarily always show greater levels of adoption than individuals with general knowledge who have spent less time planning. For example, 20% of consumers state a willingness to pay between 10% and 20% more for micro-generation products than conventional technologies, yet actual adoption is less than 1% (Truffer et al 2001).

2.2.3 Learning and Cognition

The behaviour of an individual will be shaped by their knowledge and values (Kaiser et al. 1999), for example, Correira (2005) and Ellen (1994) both highlight examples where the existence of higher levels of knowledge was an important predictor of pro-social and pro-environmental behaviour. It has been shown that individuals with either more knowledge or concern about particular environmental issues state a willingness to pay higher prices for environmentally friendly products (Rowlands et al. 2002; Prakash 2002). The formation of attitudes as proposed by Schiffman and Kanuk (1997) is defined as a learnt disposition. Taking these examples together demonstrates that knowledge, the process of learning and cognitive ability is an issue that must be considered when reviewing consumer behaviour.

The ability to process mental information will be limited by an individual's cognitive ability (Carroll 1993). In turn, the ability to use a wider variety of processing strategies will be influenced by an individual's cognitive complexity (Zinkhan and Braunsberger 2004). The higher the utilisation of product information and marketing messages has been shown to affect how individuals analyse products. Analysis requires evaluation of both the content and the structure of a product; 'content' is defined as a mental evaluation borne from knowledge and beliefs about that product, whereas 'structure' defines how the individual cognitively places the product in relationship to others (Zinkhan and Braunsberger 2004).

Using a repertory grid to analyse cognitive complexity in relation to consumer behaviour, Zinkhan and Braunsberger (2004) found that although individuals may have a complex understanding of one product, they may have a more simple understanding of another, hence cognitive complexity is a context specific phenomenon. In seeking to understand the basis of complexity, the research found support for the concept that where individuals had had more experience, and had been exposed to more stimuli regarding the products, they had developed superior evaluative criteria and problem solving skills. This in turn enabled the individual to make decisions to be made independently of the experience of others. The individual could also transfer knowledge to other adopters and would be more open to further product training. In other words, a virtuous circle had developed in that the more individuals knew, the more they wanted to know.

Relational Discrepancy theory (Robins and Baldero 2003) suggests that while individuals have a large reservoir of self-knowledge, they only use a fraction of this resource at any one time, in what is a working knowledge. It is important to note that although an individual may be consistent at a point in time between their attitudes and behaviour, inconsistencies will occur over time as the working knowledge changes.

Individuals will self-regulate their relationships with products using internal guides, standards or values (Robins and Baldero 2003). It is generally accepted that these internal guides are learnt when the individual is young, and depending on how the individual was nurtured will follow either a promotional self regulation, which drives the individual to nurture and aspire. Alternatively, the individual will follow a preventive self-regulation, which drives the individual to make decisions based on safety, duty, and obligation (Robins and Baldero 2003). This is consistent with the findings of Stern et al (1999) in that promotional self-regulation may correlate to self-enhancing values, and preventive self-regulation may correlate to self-transcendent values.

2.2.4 Cognitive Consistency and Dissonance

Closely related to theories of cognitive ability are cognitive consistency theories such as Balance Theory, Consistency Theory, and Cognitive Dissonance Theory which highlight an individuals' need for consistency. This is an important issue to explore as dissonance occurs at the individual level and will affect adoption decisions (Jermias 2001).Cognitive Dissonance Theory, for example, postulates that internal feelings of discomfort (known as 'Dissonance') motivate people to reduce inconsistencies in the cognitive information they hold about themselves, their behaviour or their environment (cited by Jackson 2004).The impact of this is that where individuals experience inconsistency, a state of dissonance is created and drives a desire to return to consistency.

Relational Discrepancy Theory suggests that discrepancies represent different qualitative psychological situations and lead to differing outcomes, thus the consequential feelings that individuals experience may result in behaviour other than that originally intended by that individual. For example, discrepancies that occur when the individual is acting against their 'ideal' standard will cause a 'dejection' related outcome, and discrepancies that occur against a more definite standard, by which the individual believes they 'ought' to behave, will create an 'agitation' based outcome (Robins and Baldero 2003).

Individuals have been shown to adopt various strategies for reducing dissonance when it occurs and the extent to which these are followed is dependent on the choice and commitment of the individual. For example, if an individual follows a course of action but experience dissonance, they may attempt to persuade themselves that having followed that course of action, the rejected alternative was less attractive, and that the chosen alternative was not as unattractive as they originally perceived. Similarly, the individual may exaggerate the attractiveness of the chosen alternative and the unattractiveness of the rejected alternative (Jermias 2001).

Alternatively, the individual may seek advice from their social network in order to improve their own judgment or to increase their justification for a decision. In this way, they learn vicariously in order to fill gaps in their own knowledge or assess the value of alternative options (Norton et al. 2003).

It has been demonstrated that individuals have a confirmatory bias which impacts on how they use advice or information. For example, they may ignore or hypercritically scrutinise feedback that disagrees with their point of view (Vinning and Ebreo 2002). Alternatively, they ignore the advice, or accept it in part with modification, or accept it unconditionally (Abrahamse et al 2005). Yaniv (2004) identified factors that will affect whether or not attitudes can be changed through advice. The key influences are knowledge of the field in which the decision is made, and also the relative distance between the opinions of the individual seeking advice and the advisor. Hence, those with less knowledge are more likely to take advice, and where advice is consistent with the individuals' own opinion, it is regarded. However, there are no guarantees that the advice will be right, nor is there clear justification for ever accepting knowledge from others.

2.2.5 Social Influences

Cognitive consistency theories have demonstrated one role that the social network can have on influencing adoption decisions. Social learning theories explain human behaviour in terms of a continuous reciprocal interaction between cognitive, behavioural, and environmental influences. Social learning theories span cognition and behaviour because they bring together components such as attention, memory, motivation, and reproduction of behaviour.

Bandura's (1977) social learning theory emphasises the importance of observing and modelling the behaviours, attitudes, and emotional reactions of others. This is because individuals recognise that learning would otherwise be slow and inefficient if they relied on their own experiences. If the behaviour that individuals observes is close to their own values, or the model of the behaviour either resembles or is admired by the observer, it is more likely to be adopted (Lavoie 2004). This concept is compatible with some models of attribution theory (e.g. Kelleys Attibution theory in 1967, which developed Fritz Heiders (1946) theory of the same name.

Consumers can also be influenced by what effect their actions can have when combined with those of others. The effect of perceived consumer effectiveness (PCE) is based on the concept that individuals will be motivated to act if they realise that they are part of a collective effort to achieve a certain goal (Stern et al 1999, Peattie 2001; Roberts 1996). This requires a level of trust that other stakeholders, such as politicians, will do their part in achieving an overall goal (Lee and Holden 1999). The alternative situation is that consumers may feel that their actions are isolated and have no collective effect; the concept known as the 'collective action dilemma' (Prakash 2002).

Reducing dissonance in relationships may suggest that individuals will gravitate towards others that have a closer opinion to their own. Heider's Balance Theory (1946), suggests that individuals will develop positive attitudes towards those with whom they have had previous association, which is important in that it introduces the element of trust in a relationship. Homans' Social Exchange Theory suggests that individuals choose whom they have a relationship with based on demographic characteristics, personality attributes and their attitudes. These relationships have a strong degree of commensurability, in that individuals are more likely to engage with one another if their attributes are common, even if they are diametrically opposed (Corbitt et al. 2003). For example, if both people believe in the existence of 'climate change', they are more likely to engage with each other, even if they are at polar ends of the debate regarding its potential consequences, than if one of the parties had no view on or belief in its existence as an issue. Hence, if one does not share some qualities, aspirations or obligations with another, they will not connect (Robins and Baldero 2003).

Discussing the effect of the social environment on behaviour, Stern et al. (1999) used the basis of norm activation theories, i.e. personal and moral norms, to develop the Value-Belief-Norm (VBN) theory, which was used to explain public support for environmentalism. Stern et al.(1999) argue that 'Norm' activation follows when an individual has become aware of potential consequences that may arise from an action. Through the ascription of responsibility for those consequences, individuals will alter their behaviour, thus activating their personal norms. Adding to this, moral norm activation theory posits that when an individual has accepted the beliefs of a particular movement, generally on altruistic principles, they accept responsibility that their own actions may affect those beliefs and modify their behaviour.

Wider cultural and societal influences will also influence behaviour (Dunphy and Herbig 1995). A collective society will look more readily for solutions to global issues compared with an individualistic society (Pedersen 2000; Parthasarathy et al.1995). Collective societies have greater social interaction and disseminate messages faster. However, individualistic societies, such as in the UK, tend towards more materialistic values (Lynn and Gelb 1996), which is relevant to this study when considering the inclination of an individual to buy a personal, domestic power generation system.

In respect of the product, Peattie (1992) and Rogers (2003) are consistent in their findings that products must be compatible with the cultural environment in which the adopter resides. Heimburger et al (2002) recognised that a key cause of failure to adopt emergency contraception was the role of cultural influences such as family norms and religious beliefs. However, individuals cannot learn in isolation, in that they learn from the attitudes and behaviours of others, born of different experiences, and that they use these to develop their own beliefs and personality.

The preceding sections have discussed a broad range of influences and issues that affect consumer behaviour. The following section seeks to understand how these issues have been incorporated into frameworks that can be applied to explain, describe or explore adoption behaviour.

2.3 Innovation creation, adoption and diffusion

The innovation literature highlights three key processes; namely innovation creation, adoption and diffusion. It is important to distinguish between these processes in order to prevent confusion on the part of the reader. Within this section, two models of adoption and diffusion are reviewed; namely the Diffusion of Innovations (Rogers 2003), and the Model of the use and adoption of renewable energy systems (Caird et al.2008). The purpose of this review is to determine whether or not these models can provide a framework on which to base further research.

Drucker defines innovation as the *'effort to create purposeful, focused change in an enterprise's economic or social potential'*. Innovation creation and its effects on society have been the source of debate for many years. The effects of innovation were first proposed within the 1776 treatise 'The Wealth of Nations' (Smith 1776). The proposition stood that innovation led to efficiencies in productive power, which in turn gain the landlord a greater proportion of the wealth. Marx and Engels, within the 1848 'Communist Manifesto', write that the bourgeoisie cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society.

The source of innovation has also been the source of debate. Drucker (1985) identified seven sources of innovative opportunity, four of which arise within industry, and the remaining three are within the social environment. The industrial sources include unexpected results from a particular process, or incongruity with received wisdom. Further, innovation could arise by identifying the need for a whole new process or part of an existing one, either by analysing an existing process or following a shift in the industry or market structure. Steiner (1995) proposes that individuals who innovate are not restrained by a specific paradigm but are practically involved within a complex environment as opposed to being rationally involved with a conceptually simplified environment. This opposes Heidegger’s existentialist view that humans innovate in response to practical involvement rather than scientific thought, which he believed was the luxury of the few (Ree 2000).

Organisations profit from innovation by creating a state of ‘creative destruction’ where the circular flow of income is disturbed by the introduction to the market of an innovation. Profits are gained from being within a field of productive activity; in other words, the organisation gains profit from the value adding activity that disturbed the circular flow (Cantwell 2007). The ability of an organisation to efficiently discover, assimilate and exploit new methods or opportunities has been identified as ‘absorptive capacity’ (Lenox and King 2004). Schumpeter, a renowned economist, recognised that well-resourced firms would be key agents for innovation and would consequently gain profit due to the market power they could exercise (Cantwell 2007).

The adoption of innovations describes a point in time when the adopter of an innovation decides to use the innovation in question. Rogers (2003) theorises that the process of adoption commences with an individual driven by precedent conditions such as a felt need to adopt an innovative product or service. The individual will pass along an innovation decision process at a pace that is influenced by their own level of innovativeness and by the perceived characteristics of the innovation. The decision making process is aided by communication channels; either mass-media communications or by local channels such as word-of-mouth (see Figure 1, below).

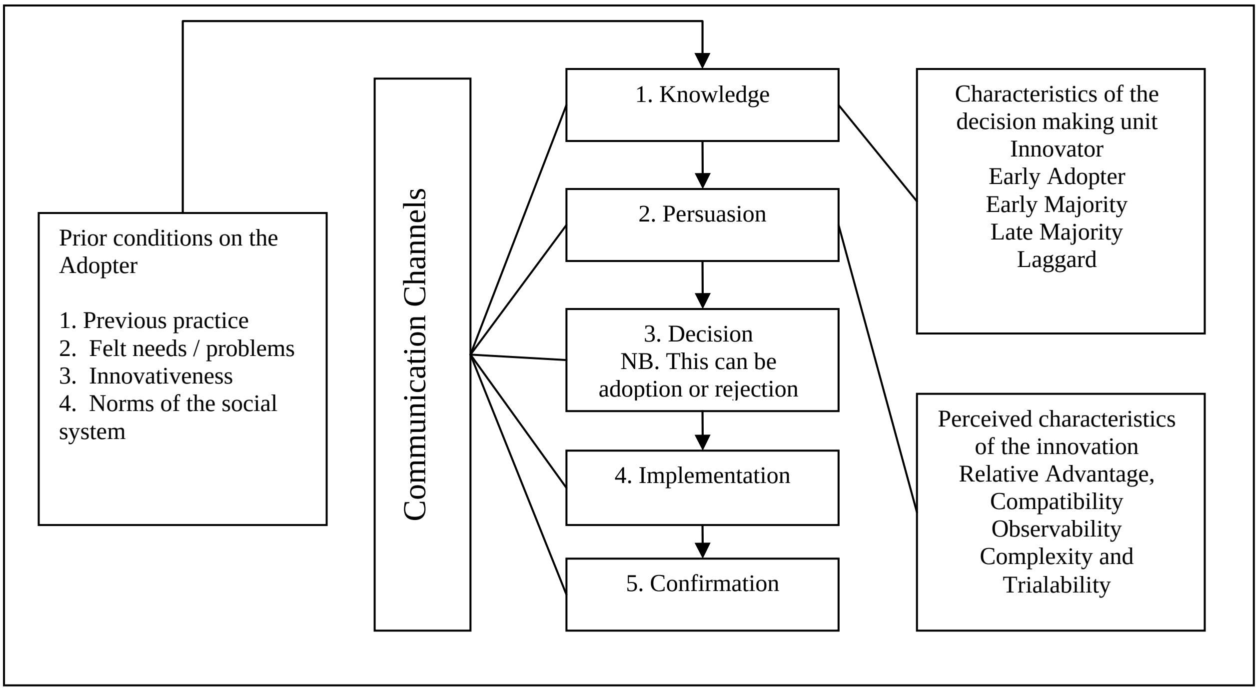

Figure 1. The adoption of innovations process (Rogers 2003)

The process of innovation decision (see Table 2) describes how potential adopter passes sequentially from gaining knowledge to ultimately confirming or not, their decision to adopt an innovation. The process follows the paradigm of rational choice (as reviewed by Lovett 2006), in that individuals are predisposed to learn about an innovation, and through a process that analyses the costs and benefits of an innovation, ultimately reach a decision of whether or not to adopt. Other models of consumer behaviour follow a similar process of cognition then affection and finally behaviour. These include the model of attitude formation (Schiffman and Kanuk 1997) and the buying process (Peattie 1992).

Rogers (2003) identifies that the first step in the process is when an adopter undertakes a cognitive process of thinking and learning about an innovation. The second step is one of persuasion, otherwise described as an evaluation of the attitudes formed by cognition (Huber et al 2004). The decision step is informed by the knowledge gained, and the later opinion formed by that knowledge. Once decided on a course of action, the adopter will implement the physical use of the innovation. For adoption to be fully complete, the adopter must confirm to themselves that the innovation satisfies their need. If this confirmation does not occur, adoption of the innovation will be discontinued (Rogers 2003).

The innovation decision process has been reviewed within the literature (e.g. Yeon et. al. 2006; Aggarwal et al. 1998) and has been applied to various studies (e.g. Morris 2004; Cestre and Darmon 1998; Dunphy and Herbig 1995).Critiques of the process are limited and include Kaplan (1999a), who stated that the early need for knowledge is critical, as it a pre-cursor to adoption interest. Other findings have been suggested that seek to re-order or embellish the steps in the model, for example, Aggarwal et al (1998) suggest an amendment to the innovation decision process by incorporating ‘interest’ as an additional stage. However, these amendments have not gained popular support.

Table 2. Steps in the innovation decision process (Rogers 2003)

Step in the model	Definition	Comments
Knowledge	This occurs when an adopter is exposed to an innovation and begins to develop knowledge of how it functions	Knowledge (a cognitive process) activities may be initiated by external factors such as mass-media advertising
Persuasion	This occurs when an adopter forms either a ‘favourable’ or ‘unfavourable’ opinion to an innovation	Persuasion (an affective process) is dependent on the attitudes of the potential adopter
Decision	This occurs when an adopter engages in activities that lead to a choice of whether to accept or reject an innovation	Innovations that can be ‘trialled’ are often a key part of the decision process
Implementation	This occurs when an adopter moves to put the innovation into use	The implementation stage requires the adopter to move from adoption being a ‘mental’ exercise to being a ‘physical’ exercise
Confirmation	This occurs when an adopter seeks to reinforce their decision to adopt an innovation	If conflicting messages are received concerning the innovation, the adopter may choose to reject the innovation

The diffusion of innovations is described as *“the process by which an innovation is communicated through certain channels over time and among members of a social system*” (Rogers 2003). Central to the diffusion process are agents of change within communities, and also different forms of communication media that are used to inform groups of adopters (Rogers 2003)

The diffusion of innovations theory has been used to explain the adoption of various innovations; Hubbard and Mulvey (2003) and Heimburger et al. (2002) used the process to evaluate the implementation of a diffusion project, and found that the adoption rate was positively related to the level of knowledge potential adopters demonstrated, and despite some adopters rejecting the innovation due to its attributes, they remained open minded to later adoption. Morris et al. (2000) mapped the decision process that farmers took to adopt a government funded grant project. From their findings, the authors were able to identify where weaknesses lay with the marketing approach the government agency took.

The model of adoption that Caird et al. (2008) propose is more directly related to the context of energy efficiency than any of the models discussed in this review and it draws on many elements common to the Diffusion of innovations model, for example the element of communication (see Figure 2).

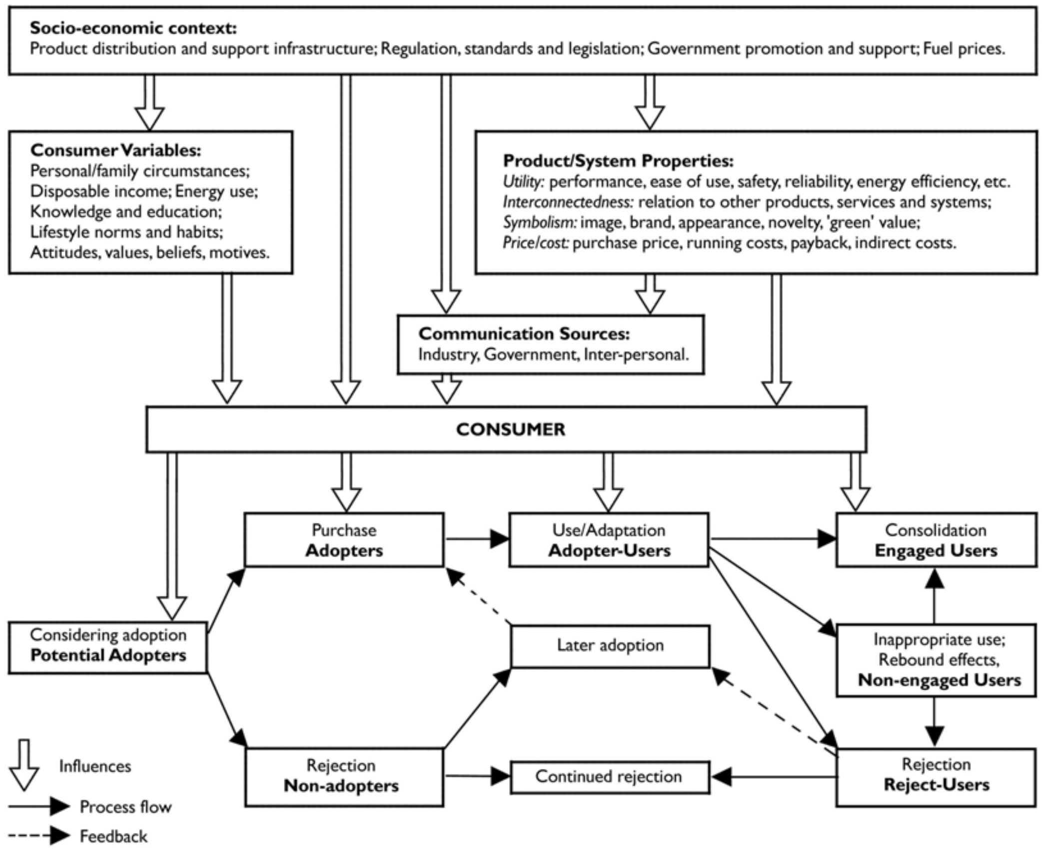

Figure 2. Model of adoption and use of renewable energy systems (from Caird et al 2008)

The results of research by Caird et al (2008) into the use and adoption of renewable energy systems by householders extends the categorisation of adopters depending on their level of engagement with the technology and motivation to reduce energy use. The model they propose presents the consumer as an agent influenced by various sources such as the socio-economic context, consumer variables, communication sources, and product and system properties. Within the two models proposed by Rogers (2003) and Caird et al (2008), there are common factors that inform the decision making process, namely the innovation attributes, and the categorisation of adopters. The following sections review these more fully.

2.3.1 Innovation Attributes

Attributes of products are critical within the decision making process ; *"the utility derived from a good comes from the characteristics of that good, not from consumption of the good itself. Goods normally possess more than one characteristic and these characteristics (or attributes) will be shared with many other goods). The value of a good is then given by the sum of its characteristics" (* Lancaster (1966) cited by Bergmann et al. (2006) . Rogers (2003) has categorised five attributes of products to act as a framework by which innovations can be described (see Table 3).

Attributes do not compensate for each other (Rogers 2003). For example, if the relative advantage is not apparent, the compatibility factors would not be considered, nor could a high compatibility make up for poor relative advantage. A product that demonstrates good relative advantage does not necessarily enhance the trust that adopters have in it, although it may influence their perceptions on quality and how they would use it (Vollink et al. 2002).

Rogers' framework of attributes has been criticised for being too broad by many researchers who often focus attention on particular aspects of attributes. For example, Vollink et al (2002) proposed that relative advantage should be split between 'capital cost' and 'perceived saving'; that compatibility should be split between 'attitude' and 'lifestyle'; and that three additional attributes be added, namely 'certainty of savings', 'dissatisfaction with the current situation' and 'efforts and skills to install the innovation'. Pujari et al (2003) propose that only two attribute levels exist, namely 'core' attributes and 'auxiliary' attributes. Whereas 'core' attributes provide the basic level of benefits that consumers require, 'auxiliary' attributes help to define products against each other. However, the definition of ‘core’ and ‘auxiliary’ will change for each product or service depending not only on the context in which they are being used, or the individual that is adopting the innovation. Whilst all these criticisms of the attributes have individual merit, none have gained popular and sustainable support.

Table 3. Definitions of innovation attribute categories (Rogers 2003)

Attribute	Definition	Comments
Relative Advantage	The degree to which an innovation is perceived as being better than the idea it supersedes.	The nature of the ‘innovation’ is critical in determining what the aspects of ‘Relative Advantage’ are to adopters.
Compatibility	The degree to which an innovation is perceived as consistent with existing values, experiences and needs of adopters	The better the level of compatibility with values, experiences or needs reduces uncertainty and risk on the part of the adopter and faster the rate of adoption
Complexity	The degree to which an innovation is perceived as relatively difficult to understand and use	The greater the level of perceived complexity is typically negatively related to the rate of adoption
Observability	The degree to which the results of an innovation are visible to others	The greater the level of observability the more rapid the resulting rate of adoption
Trialability	The degree to which an innovation may be experimented with on a limited basis	The greater the level of trialability the more rapid the resulting rate of adoption

Relative advantage is considered to be the most influential of the five attribute categories (Rogers 2003), and together with compatibility and complexity has been shown to hold the most influence over the decision of whether or not to adopt (Rogers 2001; Mohr 2001; Martinez et al 1998; Dunphy and Herbig 1995). The critical aspect of relative advantage is how potential adopters perceive the advantage, rather than how the product or service actually performs (Smizgin and Bourne 1999; Aggarwal et al. 1998), as each innovation will have its own set of performance characteristics (Martinez et al 1998). Relative advantage may include standards of manufacture, design and performance, which are considered crucial when adopters consider innovative products with which they are unfamiliar relative to their existing choice (Peattie 2001; Pederson 2000; Smith 2001; Rowlands et al. 2002; Bang et al.2000).

Within the attribute of relative advantage, Rogers (2003) identifies other factors that will affect the rate of adoption. Rogers proposes that if an innovation is mandated then its rate of adoption will increase, for example, the introduction of a restriction on private car use in California resulted in more effective congestion relief than previous voluntary schemes had seen (Rogers 2003). If an innovation has been developed in order to prevent something occurring, its rate of adoption will be slow because the advantages take longer to be realised. For example, safe sex practices can be effective in reducing the incidence of HIV/AIDs, and unwanted pregnancies but research showed that individuals were willing to take the risk of not practicing safe sex because the chances of either catching HIV/AIDs or becoming pregnant were nominal (Rogers 2001, Rogers 2003; Heimburger et al 2003).

An additional factor is whether or not the innovation is entirely new to the market (described as ‘discrete’) or whether it is a development of an existing innovation (described as ‘continuous’) (Moore 1999; Smizgin and Bourne 1999: Rogers 1995). ‘Discrete’ innovations define new product categories, represent new technologies, shift market structures, require consumer learning and induce behavioural change (Aggarwal et al. 1998). For example, a car powered by liquid petroleum gas may require a different method of refuelling than that of conventional fuel and the adopter of the technology may need to find a new source for the fuel. On the other hand ‘Continuous’ innovations do not require life-style change in order to make use of them, for example a car that uses existing fuels more efficiently than previous models. The impact of these innovation attributes will be seen on the categories of adopters they attract; early adopters are more likely to adopt a discrete product as they are willing to put up with the inconvenience, whereas ‘later adopters’ will be more attracted to continuous innovations (Moore 1999).

Risk is a critical determinant of innovation adoption and can be based on either physical or cognitive issues; for example, performance or perceptions (Rogers 2003). Whereas Rogers (2003) incorporates risk as an element of the compatibility attribute, others consider it should merit its own attribute level as they consider it to be a restrictive element (Smizgin & Bourne 1999; d. Ruyter 2001). For example, where an individual has few resources available, for example financial resources, living space, accessibility, they will be more influenced by the degree of uncertainty or risk arising from an innovation than if they had a surplus of resource (Martinez et al 1998; Aggarwal et al. 1998; Smizgin & Bourne 1999; Ruyter 2001).

Reputations, product warranties and experience all serve to alter risk levels and are commonly used in industry as risk relieving tactics (Corbitt et al. 2003) However, changing commercial aspects of the products or services does not guarantee successful adoption, for example, firms can decrease disadvantage by offering incentives (Velayudhan 2003; Prakash 2002). These incentives can take many forms, either monetary or non-monetary, but examples have demonstrated that by featuring grants as part of a promotional package focuses attention on the high cost of the innovation and away from some other advantageous features that might have persuaded a potential consumer (Aggarwal et al. 1998; Velayudhan 2003). In addition, consumption on the basis of an incentive can lead to discontinued use of the product if the individual becomes disillusioned with it, and withdrawal of the incentive may lead to reduced levels of consumption (Cabraal et al.1998; Rogers 2003).

2.3.2 Categorisation of Adopters

The adoption of innovations occurs over time, the rate of which is determined by the individual (Rogers 2003). Within groups of individuals, many are likely to differ in their attitude or perception to the same innovation, and in order to understand those differences, adopters have been categorised into five groupings. These range from those that are likely to adopt innovations readily, to those that will adopt only after a long period of time (see Table 4).

Rogers (2003) makes several generalisations about socio-economic, personality and communication behaviours of the different adopter categories. Relative to socio-economic factors, Rogers claims relationships between propensity to adopt and factors of age, levels of education and literacy, social status and mobility. For example, younger, better educated, higher levels of social status and levels of mobility are more likely to be early adopters than those who are older and less well educated (Rogers 2003).

In agreement with this claims, Vlosky et al. (1999), and Pedersen (2000) all concluded that individuals with higher levels of education are more likely to buying environmentally sensitive products, which are innovative to the market place. Rogers' profiles fit with the economic reasoning of Smith (1776) who suggested that those more likely to succeed in the economic race, i.e. those taking advantage of innovation, would be those better educated and informed. Recently, Velayudhan (2003) concurred with

Roger's profiles to the degree of identifying innovators that had higher incomes, and were opinion leaders in local society.

Table 4. Definitions of adopter categories (Rogers 2003)

Adopter Category	Definition	Comments
Innovators	• Obsessively venturesome • Able to understand and apply complex technical knowledge • Able to cope with uncertainty • Socialise with groups outside their local (geographic) system	2.5% of the group
Early Adopters	• More integrated into the local social system than 'innovators' • The group contains a high number of opinion leaders • Make judicious 'innovation-decisions' in order to maintain the esteem of being a local reference point	13.5% of the group
Early Majority	• The group will follow early adopters deliberately, waiting until a 'seal of approval' has been placed on the innovation • The decision to adopt takes purposefully longer than earlier groups.	34% of the group
Later Majority	• The group are typically cautious and sceptical • Will act on system norms, making decisions often based on financial necessity or increasing peer pressure • Relatively less well resourced than earlier groups	34% of the group
Laggards	• Many of the group may be isolated in some way • The point of reference is mainly the past i.e. previous experience (either actual or vicarious) • Require high levels of certainty prior to adoption so as not to waste precious resources	16% of the group

However, Sultan and Winer (1993) and Martinez et al (1998) argue against Roger's proposition that adopter profiles remain the same across products. They claim there is inconsistency in adopter profiles across products; that is to say, an innovator for one product may be a laggard for another, and profiles change for every innovation because of the variety of attributes specific to it. However, their resulting conclusions are limited to one socio-demographic factor of age.

In support of the criticism against Rogers' assumptions, Straughan and Roberts (1999) demonstrated that characteristics of age, gender and income, which may previously have been found to have some correlation to stated 'green' consumption, are unlikely to actually influence positive eco-behaviour. Later evidence from Peattie (2001), and Laroche et. al. (2001) found that consumers of ecologically compatible products tended to be less educated. Martinez et al. (1998) actually found that older females were more likely to adopt new appliances than younger females; a direct contradiction of the Rogers generalisations.

Taking this further, Diamantopoulos et. al .(2003) suggest that the relationship between socio-demographics and adoption is complex. Following empirical testing, they found that individuals who had had less education were observed to act no differently in their adoption behaviour to those who had had greater levels of education. Moreover, it has been proposed that earlier adopters are often users of similar products in the same category as the innovation, a proposal that would render demographic profiles meaningless (Garling and Thorgesen 2001). These individuals have developed internal reference prices based on knowledge and competence, and the actual cost of the innovation is not important but what it is worth to them as an individual that matters. For example, an electric vehicle will be adopted by an individual who is more interested in improving air quality and reducing demand on natural resources, than an individual who desires speed and performance, and these values can transcend demographic or socio-economic categorisation (Garling and Thorgesen 2001).

There are further minor points of disagreements on details; for example, Kaplan (1999a) proposes that adopters require technical knowledge about an innovation, although Kautz and Larsen (2000) disagree, proposing general knowledge is more important. Moore (1999) infers agreement with both points of view, stating that differing categories of innovation will attract different personality types.

Moore (1999) has observed a phenomenon whereby an innovation that is readily adopted by the innovator and early adopter categories is not necessarily adopted immediately by the majority groups without some amendments to ensure its practical application. Moore (1999) describes this situation as a ‘chasm’ (see Figure 3) and illustrates the effect when promoters of an innovation try to extend the market from one consisting of visionary early adopters to one of a more pragmatic early majority. The failure occurs because they (the promoters) are operating without a reference base for the new group, which has been shown to require strong references and support in their adoption decisions.

Adopter Categories					
1. Innovators	2. Early Adopters	Chasm	3. Early Majority	4. Late Majority	5. Laggards

Figure 3. The position of the chasm (Moore 1999)

Therefore it is important for manufacturers to develop products with the earlier adopter categories to make them more reliable and productive, hence narrowing the width of the chasm so the innovations appear more attractive to the pragmatic audience of the majority categories. These concepts are founded on research which concludes that pragmatists will find innovations attractive if they originate from an established manufacturer, have a recognisable quality, and fit within a supporting infrastructure of products and systems (Moore 1999). Pragmatists will consider factors beyond the innovation itself, and place a certain degree of the adoption decision on aspects such as the quality and reliability of service they receive from suppliers. Therefore, while pragmatists are a more challenging group to satisfy, they are vital for the sustained success of the innovation as they number three times more than the innovative categories (Mohr 2001; Moore 1999).

This section has outlined two frameworks of innovation adoption, and detailed two of the critical components of them, namely the attributes of innovations and the categorisation of adopters. In regard of the issues associated with consumer behaviour, the process of innovation decision as proposed by Rogers (2003) does follow a process of rational choice, albeit bounded by the levels of knowledge that the adopter has in regard of the innovation, and also by the influences exerted by the social network. Diffusion of Innovations does consider that adopters have differing characteristics that affect the point in time when they adopt, although certain incongruities exist in relationship to other research on values and attitudes. Both models of innovation adoption recognise that adopters have to go through a process of learning and cognition and to that extent, recognise the effect of dissonance in that adoption can be discontinued if dissonance prevails. The following section brings together the frameworks and the issues previously discussed which affect consumer behaviour, and articulates the objectives that were set for further research.

2.4 Summary and conclusions of the literature review

This section summarises the literature review and identifies the opportunities that exist for primary research. The aim of this thesis was to provide new insights into the adoption of solar power technologies. The literature review was carried out in order to identify theories of technology adoption which will enable the adoption of solar power technologies in the UK domestic sector to be assessed in a new light. The following section outlines the rationale for the remaining objectives in this thesis.

There are two forms of solar power technology that can be used in a domestic situation, namely photovoltaic, which generates electricity, and solar thermal, which generates hot water. These two forms of the technology have different characteristics, both in terms of the inherent technology and also their economics (BRECSU 2001). Governmental policy has identified that both forms of the technology provide potential for carbon reductions but limitations have been identified such as high capital costs and low levels of productivity which are preventing widespread adoption occurring (Timilsina 2000; Berger 2001). In addition, legislative barriers, and low levels of awareness have also been identified as reasons for poor levels of adoption (Caird et al. 2008).

Nevertheless, there is a market for solar power systems which governmental policy is attempting to develop. However, there is a lack of detailed information on the rate of adoption of domestic solar systems. This includes a lack of data regarding sales figures, adoption curves and projected adoption information. The literature shows that the rate of adoption of insulation products is good and that the market for them was predicted to remain strong until 2009 (Mintel 2005). Therefore, an objective to develop further understanding between the attributes of the technologies was considered appropriate, hence:

Objective 2. To identify differences in the rate of adoption between energy efficiency and solar power technologies in the UK domestic sector

Theories of rational choice could be used to further inform how consumers view the attributes of solar power systems. However, Lovett (2006) suggests that researchers are wrong to assume that the rational choice paradigm can be used to explain individual behaviour, but that it is more useful when reviewing the actions of a social network; Rosenberg (1979) stated that economics is not interested in the actions of individuals, but in the actions and behaviours of groups, and therefore applying Rational Choice to the study of individuals could be erroneous (Lovett 2006, Schotter 2006). Further to this, the literature suggests that consumers follow a process of bounded rationality more often than one of perfect rationality(e.g. Green and Shapiro 1994; Rios 2006); basing decisions on heuristics (Elster 1977; Haugtvedt et al.2005). . However, there is little research that identifies a comprehensive set of heuristics relevant to solar power systems (Bird et al 2002, Salmela and Varho 2005). Hence,

Objective 3. To identify the heuristics that consumers use in their adoption decisions regarding solar power technologies

Further criteria have been demonstrated to influence the decision making process, for example values and attitudes (Stern et al. 1999; Chiu 2005), Learning and Cognition (Zinkhan and Braunsberger 2004; Rowlands et al. 2002), cognitive consistency and dissonance (Jermias 2001), as well as a number of social influences, which are apparent throughout several theories; such as Bems 1972 self-perception theory, norming theories (e.g. Stern 2000)and Banduras (1977) social learning theory.

Existing theoretical frameworks of innovation adoption have been used to describe the adoption of solar power systems; such as the diffusion of innovations theory (Rogers 2003) and the model of adoption and use of renewable energy systems (Caird et al

2008). However, a review of the broader consumer literature identifies some weaknesses in the frameworks, described below;

Stern et al (1999) recognised four value types into which individuals can be categorised with each cluster type behaving differently. This is due to the effect that values have on attitudes (Kanuk and Schiffman 1997) and perceptions (Hansen 2005) of individuals. Hence, it is a questionable proposition within Rogers (2003) that all categories of adopters will follow the same decision process, but the main difference will be the time at which they take their adoption decision.

Moore (1999) identifies that some categories of adopters will adopt innovations later in time because the attributes of the innovations have been improved, making the innovation more pragmatic. Diamontopoulos et. al .(2003) and Garling and Thorgesen (2001) both suggest that simply using demographic variables to differentiate adopter characteristics is too simplified. This too, brings into question that proposition within Rogers (2003) that the socioeconomic characteristics of adopters, for example age, education, literacy, and social status will be a greater influence on the adoption decisions than values and attitudes.

Moore (1999) writes a compelling account of the management implications and assumptions which support the presence of the chasm, but as yet, no empirical evidence has been documented in the literature, particularly in respect of domestic solar power systems. If the chasm, the phenomenon that describes the differences between early adopter and the early majority, could be identified, this may positively influence the adoption of domestic solar power systems. The issues identified within the review (socio-economic characteristics, values, decision processes) could help to inform the validity of the chasm for innovations other than high tech products. Hence, a fourth objective was set:

Objective 4. To explore whether or not a chasm exists between earlier and later adopters of domestic solar power technologies

Finally, in order to bring the thesis to a logical conclusion, it was considered that the findings of the objectives should be assessed in order to ascertain the impact of any substantive knowledge on the current framework of policy. Hence, a fifth objective:

Objective 5. To identify policy relevant insights into the adoption of solar power technologies in the UK domestic sector

The discussion and conclusions chapters therefore contain reference to the results of the primary research and the methods used to achieve them, and also analyse the results in light of the literature review. The following chapter outlines the research methodology that was developed to support this thesis.

3 Methodology

This chapter explores and critiques possible research methodologies, in order to develop an appropriate methodology for this research programme. The strategic purpose and design of the research is detailed, including the method, data collection and analysis. Consideration is given to construct validity, internal and external validity and reliability.

Responsible research, which is carried out with a scientific attitude, should be carried out systematically, ethically and with some degree of scepticism (Robson 2002). This should include having a duty of care for the results and subjecting the work to scrutiny. Hence, this chapter discusses the technical considerations relevant to the selection of research purpose, strategy and method in order that the final results that are presented are valid, reliable and credible. The following section describes the purpose and strategy for the research; the methodology is described in subsequent sections.

3.1 Research Purpose and Strategy

The purpose of research is to explain, describe or explore situations in order to further understanding. Typically, research programmes have been categorised as having three key purposes; to explore, to explain and to describe (Robson 2002), as outlined in Table 5, below. Exploratory research will seek to find out what is what is happening in situations previously unexplored. On the other hand, explanatory or descriptive research will take a situation that has been explored and seek to identify a greater level of detail in order to find causal relationships, or extend previous knowledge. However, programmes of research can be flexible and utilise or integrate elements or techniques that are used in each of the techniques.

Table 5. Table showing rationale behind research purposes (after Robson 2002 and Yin 1993)

Research purpose	Rationale	Type of research question
Exploratory	• To find out what is happening • To seek new insights • To ask questions • To assess phenomena in a new • light • Usually, but not necessarily qualitative	How many? How much? Who? Where?
Explanatory	• Seeks explanation of a problem (usually a causal relationship) • Experimental basis • Often theory driven • Often, but not necessarily quantitative	What? Why?
Descriptive	• To portray an accurate profile of situations • Requires extensive previous knowledge (in order to form a basis of hypotheses) • Non-experimental basis • Can be qualitative or quantitative	How? Why? What is going on here?

The aim of this thesis was to provide new insights into the adoption of solar power technologies; an aim that is inherently exploratory in nature due to gaps in the knowledge concerning detailed information on the rate of adoption for domestic solar systems, and the understanding of relevant heuristics that adopters utilise in respect of solar power systems. The aim was disaggregated into a series of objectives, some of which were seeking to describe the current situation; hence the overall purpose of the research is exploratory in nature with some descriptive elements.

The strategy that a research programme follows will facilitate the research purpose. Robson (2002) proposes that certain strategies favour certain research purposes (See Table 3). As can be seen from table 6, exploratory research would typically adopt a case study strategy, which is an assessment of situations and problems in the environment or context in which they occur.

Table 6. Purpose, Strategy and Method (after Robson 2002)

Research Purpose	Research Strategy (most typically applied)	Research Method (most typically applied)
Exploratory	Case Study Ethnographic study Grounded Theory Study	Qualitative
Explanatory	Experiments	Quantitative
Descriptive	Survey	Quantitative

The purpose of this research was exploratory, with some descriptive elements; hence, it was considered appropriate that a case study would be the most appropriate strategy with a survey being used to fulfil the descriptive element of the research. A benefit of the case study strategy is that it allows flexibility in the design, and can incorporate data from a multiple of sources and issues. Multi-modal studies, i.e. those that collect data from a range of source material are more robust in their conclusions (Yin 1993).

The basis for the case study was found in the form of a series of marketing projects that were undertaken in Central England operated by a Local Authority, with mandatory responsibilities for promoting energy efficiency. In 2001, Daventry District Council launched the third of three marketing projects that aimed to promote the uptake of energy efficiency technologies by private householders in Northamptonshire. The projects presented a primary source of data, which was available for analysis and which included qualitative and quantitative data. The projects provided data regarding sales of high efficiency boilers, cavity and loft insulation and solar photovoltaic and solar thermal systems, as well as access to contact information of the individuals that had purchased the systems. The following sections detail the methods used to achieve the primary research.

3.1.1 Technical Considerations

The choice of research methods will often be informed by the research strategy; whether the research will be based on quantitative or qualitative data. Outcome based research will require quantitative data to explain or describe a situation, whereas a focus on processes requires qualitative data in order to explore a situation (Robson 2002) In addition, the design of the research programme can inform the use of quantitative or qualitative data; for example, studies with flexible designs generally involve the use of non-numeric data and the details emerge during the research programme. Fixed designs on the other hand tend to utilise numeric data, so the researcher can detail the design of the research prior to its execution (Robson 2002).

It is necessary to consider the validity of conclusions, particularly if a researcher is seeking to make generalisations in relation to a larger population (Dillon et al. 1994). Reliability is defined as the extent to which conclusions drawn from findings are stable and consistent, for example by ensuring that consistent results are achieved if research data were tested at different times (Robson 2002). Further validity can be achieved by determining construct validity; whether or not the variables within the study are representative of the variables being studied. Internal validity is demonstrated when it can be proven that any treatments applied to a situation cause are the causal factor in the outcome, rather than another factor (Dillon et al.1994, Robson 2002).

3.1.2 Ethical Considerations

Good quality research activities require that a duty of care is given to the implementation and reporting of the research. Issues such as illegal and unlawful activities could be encountered, which if not dealt with appropriately could compromise the entire research programme (Robson 2002). As stated above, this research was carried out under the regulations stipulated by both the Energy Savings Trust and Daventry District Council. It should be noted that these two agencies are publicly funded organisations and subject to scrutiny by the political process.

During the course of the research, new legislation was introduced relating to data protection and access to information legislation which enabled the public to pursue a legal case if they felt that their rights to information handling were abused. Hence, the impact of these regulations did restrict some of the information that the research programme could collect and the number of times information could be collected.

3.2 Research Methods

As described above, a case study strategy was chosen for this research. The purpose of the case study was to answer the objectives that were identified from the gaps in the literature. Therefore, the case study had to be designed with these objectives in mind. The following sub-sections focus on the methods used for each objective where primary research was required.

3.2.1 To identify differences in the rate of adoption between energy efficiency and solar power technologies in the UK domestic sector

The second objective was to indentify differences in the rate of adoption between energy efficiency and solar power technologies in the UK domestic sector. The rate of adoption is measured most effectively by the number of installations, and identification of the point in time at which they were installed or ordered.

Therefore, in order to identify the differences in the rate of adoption it was necessary to carry a form of quantitative assessment of data describing when each type of technology was adopted. The data from the projects used as the basis of the case study was made available and allowed quantitative analysis of the rate of technology installation over the course of the projects.

3.2.2 To identify the heuristics that consumers use in their adoption decisions regarding solar power technologies

The third objective for the research was to identify the heuristics that consumers use in their adoption decisions regarding solar power technologies. As identified in the literature review, the gap in the literature concerned the identification of attitudes of consumers to solar power systems. The literature suggested that householders utilise a bounded rationality and base decisions on heuristics they associate with innovations. Hence, it was important in the research to firstly identify those heuristics, then to explain the levels of priority that adopters place on those heuristics. Therefore, the achievement of this objective required two steps to be taken;

- The identification of heuristics used to describe innovation attributes
- The identification of consumer attitudes to those heuristics

The following sections describe the rationale and outline of the methods that were chosen to pursue these objectives.

For ease of reference, the detailed processes that were used to develop, utilise and review the survey forms are described in section 3.5 below. This is due to the survey methodology being used to capture information for the purposes of both Objective 3 and Objective 4.

3.2.2.1 Identifying heuristics

There are different techniques for identifying product attributes; for example, Conjoint Analysis or Kelly's Repertory grid. Conjoint Analysis is a method used in Market research; respondents typically react to products in terms of their overall preference, where the objects being evaluated reflect a predetermined combination of attributes (Dillon et al. 1994). Kellys' repertory grid results in a repertory grid of bi-polar constructs that describe the attributes of products (Dillon et al. 1984).

Conjoint Analysis results in constructs being ranked against each other or a pre-determined concept (van Kleef et al. 2005). Kelly's theory, is founded on the hypothesis that every "*individual seeks to evaluate stimuli in terms of their own personal constructs and they do so within a grid or framework in which the dimensions are bipolar constructs. These techniques focus the attention of the respondent on the product as opposed to their own needs"* (Westburn 2008). Means-End chain theory proposes that these constructs are inextricably linked to the values of the individual from whom the constructs originate (Huber et al 2004).

Constructs can be elicited from respondents during group meetings, or as part of an in-depth interview using a method known as triadic sorting, where commonalities and differences about groups of characteristics are elicited from a respondent (Dillon et al. 1994, Auty & Elliott 1998). The method has the advantage that the responses are in the terminology of the respondent (often a user of the technology, but not necessarily a technocrat) which is more accessible to other individuals within that group (Lusk 1973). In order to make credible responses, respondents need to have a baseline understanding of the innovation in order to make informed decisions (Vollink et al. 2002; Vaughan and Schwartz 1999).

Other methods of articulating constructs exist and include listing the most common attributes published in the literature and creating a bi-polar repertoire using dictionary antonyms (Franck et al 2003). Alternatively, images can be presented to a respondent who is then asked to list all the adjectives they can consider. The bi-polar construct pairs are then developed using a keyword analysis for opposite pairs (Hsu et al. 2000; Auty and Elliot 1998).

3.2.2.2 Gaining responses to the heuristics

There are options for soliciting responses for research purposes; surveys, interviews, and observational methods. Techniques such as content and data analysis can also be used (Robson 2002). This research was seeking to understand the attitudes of as broad a group of adopters as possible in order to make generalisations, and therefore a survey methodology was considered most appropriate; the time that would be required for individual interviews was not considered effective given the number of informed responses that would be needed for statistical analysis.

There are two types of survey; Longitudinal surveys, which collect data from a number of respondents at a point in time, can be used to examine changes over time if they are repeated. On the other hand, cross sectional surveys examine the relationships among a set of variables between groups of respondents at a single point in time (Dillon et al.1994). Given the time restrictions for the research, a cross-sectional survey was considered most appropriate.

Criticisms of surveys include the suggestion that the nature of the data is collected in a sterile environment, rather than part of a contextually grounded conversation (Robson

2002). Surveys have been historically criticised as being positivistic, and falsely prestigious because of the quantitative nature of the data, which allows statistical inferences to be made (Yin 1993, Dillon et al 1994, Robson 2002). Critical to overcoming this issue, is the statistical robustness of the data analysis; in order to gain statistical credibility the sample size and groups must be considered.

Having selected a cross-sectional survey methodology, it was necessary to format a scale which respondents could use to provide responses to the constructs. Methods of attribute scaling involve the respondent indicating their response to either a single item, or a series of items that reflect their beliefs. Examples of multi-item formats include the Likert scale, Stapel scale, and semantic differential (Dillon et al 1994). These scales assess affective responses to pre-determined statements. The advantage of these procedures is that they are relatively simple to develop and administer, they have a pedigree of use in social research and have been demonstrated as having reliability and validity (e.g. Osgood et al. cited by Dillon 1994, and Heise 2008).

In addition, the literature review identified discrepancies concerning the generalisation that all categories of adopters will follow the same decision process, and the main difference will be the time at which they take their adoption decision. Therefore, an analysis of the order of priority that respondents place on the characteristics ascribed to attribute categories was undertaken as part of the survey. A series of statements were developed that followed the generalisations about the Attribute Framework within Diffusion of Innovation theory. This framework was selected because it has gained popular approval despite criticisms that it has attracted. Further to this, it is being used as a heuristic framework to explore responses rather than to test its application. For reasons of clarity, the statements generated will be referred to throughout this thesis as ‘Decision Priority Statements’. The responses to these statements were simple ‘Yes/No’ responses. The intention was that the response would reflect the respondent’s perspective of the decision process.

The responses from the survey were analysed using statistical techniques; the choice of statistical test follows a typology depending on the number of groups being analysed, and whether or not the groups are dependent or independent of each other. A third criterion in the selection of test is the level of test data, i.e. nominal, ordinal, interval or ratio data. It is recognised that where data allows for parametric testing, i.e. where data can fit parametric distribution (such as the normal distribution) (Dillon et al. 1994), this will generally deliver more accurate statistical results.

Typical statistical analysis follows a process of identifying descriptive statistics which help to illustrate the dataset with basic information, then applying statistical tests to the data (Dillon et al. 1994). Hence, descriptive statistics for each measure were calculated, which were tabulated by annual cumulative, and total cumulative figures. Further analysis was then made using statistical techniques appropriate to the type of data. The choice of statistical analysis follows a clear path depending on the quality and amount of data (Dillon et al. 1994 pp427). In this situation, given that there were comparisons to be made between two or more groups of data, and the data was ratio data, an ‘Analysis of Variance’ (ANOVA) test was used. This enabled a comparison of the difference in variance between the three sets of data available (i.e. each of the three projects generated a dataset). Thus, the three datasets (groups) could be compared for similarity.

3.2.3 To explore whether or not a chasm exists between earlier and later adopters of solar power technologies

Within the literature review, the phenomenon of a chasm that exists between earlier and later adopters was identified (Moore 1999). Applying the premise of the chasm to solar power technologies, the earlier adopters are adopting an innovation that significantly changes their existing provision, and will provide them with an advantage over their existing situation. On the other hand, later adopters are seeking to buy productivity improvements over their existing provision.

Using the results of the surveys used for objective 2, it was decided to use the results of these to identify statistical differences that might be found between the two groups to which the survey was applied. As will be described in the case study, the survey forms were sent to two distinct groups, identified as early adopters and the early majority. Statistical comparison of all the responses would therefore provide a basis of identifying whether or not a chasm exists between the differing groups of respondents.

3.3 Detailed methodology

As stated above and for ease of reference, the detailed methodology for the primary research required to answer objective 3 and objective 4 has been detailed in this section. The objective was pursued using a survey methodology. The developments, testing and application of the survey form, including the detail for each section of the form and any amendments are detailed in the following sections.

3.3.1 Survey Development Plan

The aim of the survey was to gain the maximum number of responses for analysis in order to inform the thesis objective. The plan entailed drafting and testing an initial survey form that contained several sections, as illustrated in Figure 4.

Figure 4. Plan of the survey development, testing and application

Once tested, the survey form would be revised before being applied to a group of early adopters familiar with solar power technologies. Once this initial survey was complete, the form would be revised further if necessary and then applied to a larger group of non-adopters, referred to as the early majority.

It should be noted that due to the low number of actual adopters that had installed in the systems, it was necessary to make some assumptions and use ‘proxy’ adopters. This was done in the following way; the ‘Solarplan’ project had had 400 householders who had enquired about the systems and shown an interest in pursuing installation. Therefore, this group were assumed to be ‘early adopters’ on the basis of their high level of interest and actions to seek further information. The sample was therefore taken from this group. This assumption was partially justified later in the research programme as at the time of completion of the programme, the 210 adopters had been within this group of 400.

3.3.2 Survey form content

The aim of the survey was to generate responses for analysis against the objective ‘*To identify the heuristics that consumers use in their adoption decisions regarding solar power technologies*’. The survey form was initially drafted with 5 sections, although through testing and application, this was reduced to three sections for the largest of the two surveys, to the early majority group. Table 7 provides a summary of the sections and the point in time at which they were revised.

Table 7. Survey form content

Sections	Draft Survey	Early Adopter Survey	Early Majority Survey
Demographic Information	Used	Revised	Yes
Heuristics (Semantic Differential)	Used	Revised	Revised
Opinions about Solar technology (Likert Scale)	Used	Used	Not used
Features about Solar technology (Likert Scale)	Used	Not used	Not used
Innovation Adoption process statements	10 statements used	Revised to 5	Used

As identified in the methodology chapter, a set of heuristics was solicited from a group of adopters, who had installed solar power technologies. These heuristics were used to form a semantic differential table that could be used in the survey form. The basis of the choice to use a semantic differential scale was that despite being more difficult for researchers to develop than Likert and Stapel scales because of the need to develop bipolar adjective statements or phrases, they provide good quality data (Dillon et al 1994). Likert scales were used in the draft and early adopter surveys but, as described within section 3.3.4, were considered as repetitive of the semantic differential form and were therefore deleted.

In addition to the heuristics, the literature review identified that the chasm was a key issue for the research. In order to aid differentiation between the two groups of respondents, a series of demographic features was identified and collected through the survey. Although the literature review found that demographics were not often the causal factors within the process of decision making, they do form a useful basis of analysis.,

For the purposes of testing the innovation decision process, a series of 10 statements were developed using the innovation decision process as described by Rogers (2003). This set of statements was kept to a minimum (10) as the semantic differential table was considered to have more priority at the time of the research. This issue is discussed further within the discussion chapter as the number of statements that previous investigations have used to test this process have ranged from 15 – 75 (Rogers 2003 p234). As described in section 3.3.4, this number was later revised to 5.

3.3.3 Application and Survey Size

Survey sample sizes can be determined using a number of techniques, for example blind guesses, statistical determination, Bayesian considerations, or industry standards (Dillon et al. 1994). The most common and simple to use is the industry standard, as it involves reading off a pre-determined scale, which has been generated by specialist market research organisations. An example of this is the sample size calculator (Dillon et. al. 1994 p253), which was the method that was used to determine the size of the survey for this research. In order to generate results with sufficient confidence levels (99.7%), the required survey size for the early adopters was 100. This group consisted of 100 people, drawn at random from the group of 400 enquirers to the Solarplan project. The required size for the early majority survey was 850. In order to account for the likelihood 35% of the survey forms not providing usable responses (Dillon et al. 1994), 150 extra survey forms were also sent, making a total survey group of 1000.

3.3.4 Testing and revision

During the process of development and application, the survey form was tested twice; the first time by a small group in order to ascertain any issues that would prevent responses being made. The second test occurred as a result of being applied to the early adopters; the feedback generated further revisions that were considered useful in order to elicit as high a response rate from the early majority.

The first test was carried out by ten randomly selected individuals who were involved in the Solarplan project, but who had not been involved in any aspect of the research programme. The individuals were asked to complete the survey forms and in addition, to comment on how easy or difficult the form had been to complete. The changes that were made included details concerning the demographic details in order to improve understanding, and also a revision of the multiple sections.

As described in the Methodology, the survey form was developed using two Likert Scales and one Semantic Differential scale. In addition, a True/False checklist was used. However, the feedback suggested that there were too many sections and they were repetitive. The results from one of the Likert scales had not provided any useful insights and therefore, the section was deleted. The rationale for selecting the Semantic Differential was that respondents commented they preferred the method as it was easy to use. In addition, the 10 true/false statements were reduced to 5 as respondents suggested some were confusing and repetitive.

3.3.5 Analysis

Statistical tests were used to analyse the survey responses; both descriptive and cross tabulation assessment of the data was carried out. The process of statistical testing requires the origination of a null hypothesis to guide the analysis. The hypothesis is only rejected if there is sufficient evidence to do so, which is a cautious approach and designed to avoid error (Dillon et al 1994).

Parametric analysis using Analysis of Variance (ANOVA) was carried out to test the responses to the heuristics within groups. Further tests, using Levenes Equality of Variances, were used to compare the mean responses of groups, where groups could be identified. The responses to the innovation adoption statements generated ordinal data, which was analysed using equivalent non-parametric tests, such as Kruskall-Wallis (where more than 2 samples existed) or Mann-Whitney U test (where only 2 samples existed).

3.3.6 Audience and assumptions

The 'Solarplan' project had had 400 enquiries, but at the time at which the survey was being planned, only 20 householders had actually installed the systems. However, the 'ChillOUT' project had had over 2800 householders install insulation systems. Hence, an assumption was made, that householders who had enquired to the 'Solarplan' projects were to be considered as early adopters; due to the fact that they have either stated an intention to adopt, or were in the process of adopting one of the solar technologies. The pragmatic early majority was assumed to be householders that had enquired about, and subsequently installed insulation products. The basis of this assumption was that Rogers (2003) proposes the early majority to be pragmatic and prefer tried and tested innovations. In this case, insulation products could be deemed tried and tested as their market size is significantly larger than that for solar power systems (Mintel 2005).

This chapter presented the general methodology that was used for the primary research to follow in Chapter 4. The research has an exploratory purpose, although some of the elements within the case study strategy that was adopted were descriptive. The following chapter introduces the projects that were operated by DDC and continues with the detailed results of the primary research. This forms the basis of the later discussion chapter.

4 Case Study: The adoption of energy efficiency and renewable energy technologies

The case study was carried out in sections covering the scope and context of the Daventry District Council projects and the analysis of the data and results.

This case study commences with an introduction to the projects that were operated by DDC and continues with the detailed results of the primary research, which form the basis of the later discussion chapter. The discussion chapter has been split out from the case study chapter to allow ease of reference for the reader.

4.1 Introduction

Daventry District Council (DDC), a local authority in central England, began promoting the use of energy efficient technologies in 1999 in order to fulfil its legal obligation to reduce carbon emissions. From 1999 to 2004, DDC operated three projects designed to improve the rate of adoption of energy efficiency and micro-renewable technologies. DDC initially developed a project for promoting the installation of high efficiency boilers in 1999, known as 'Boiler Magic'. Having understood previous issues that were limiting the adoption of solar technologies, the scheme adopted a method of promotion using price reduction, and implementing the installation of systems through a network of change-agents in the form of registered independent installers. The second project, known as 'ChillOUT' began in 2000 and was of a similar concept to the boiler scheme encouraging the installation of reduced price loft and cavity wall insulation through registered installers. In 2001, DDC developed a third project, called 'Solarplan', using the same business model in order to extend the choice of products to include solar thermal and solar photovoltaic products.

In 2004, DDC noticed that while the schemes to promote energy efficient boilers and insulation products had achieved their performance targets set at the outset of the project, the scheme to promote solar power had not achieved its targeted level of performance. Therefore, the scheme was proposed as a basis of academic study in order to understand further why the levels of adoption had not been achieved. The scope of the project was limited to the adoption of solar power technologies and did not include the management of the scheme.

The following sections focus on the results achieved from the primary research that was undertaken for the thesis. Section 4.2 identifies differences in the rate of adoption between technologies, and Section 4.3 identifies factors that account for adoption decisions by consumers of solar power technologies.

4.2 Results of Adoption Data Analysis

The market for energy efficiency products was predicted to remain strong until 2009 (Mintel 2005). Despite this, there remains a lack of detailed information concerning the rate of adoption of domestic solar systems as the market for the technology is fragmented and serviced by a series of mostly micro-businesses and consultancies. This section seeks to identify the differences in the rate of adoption between the energy efficiency technologies of boiler systems and insulation, and solar power technologies.

This research programme used a series of energy efficiency programmes operated by Daventry District Council (DDC) as the basis for this case study. DDC had operated three schemes to promote the adoption of high efficiency boilers, insulation products, and solar thermal and photovoltaic technologies. The driver for DDC to undertake the projects was to achieve its legal obligation under the Home Energy Conservation Act, to achieve 15% reductions in carbon emissions by 2010. The desired effect of the projects was to contribute to that result through the use of more efficient heating systems, better insulated housing, and localised energy generation.

The ‘Boiler Magic’ project was the first to commence in 2001and promoted the use of high efficiency boilers, which at the time were a development of existing technology, albeit more expensive. The ‘ChillOUT’ project began operation one year after ‘Boiler Magic’ in 2002, and the promoted the installation of loft and cavity wall insulation. Householders could choose to have either product, or both. The ‘SolarPlan’ project started officially in the summer of 2002, although the work to promote Solar Thermal and Photovoltaic technology started at the beginning of 2002.

The three projects were developed by DDC, who selected partners consisting of installers, commercial sponsors and governmental agencies. The role of DDC was to promote the technologies and administer the provision of financial assistance where appropriate. In addition, DDC undertook the role of quality assurance by screening installers and suppliers of the technologies and services.

The model of project delivery for each of the schemes was similar; householders were able to benefit from prices below market rates as either the cost of installation or the cost of the technology was subsidised through the project. The benefit therefore was that householders could purchase a high efficiency boiler at 50% of the recommended retail price (cost through the scheme £400-500), insulation could be installed from £100 to £500, depending on the size of property and configuration of products purchased, and solar power systems started from £1500. The effect of available subsidies reduced the cost of Solar Thermal by approximately £500 and Photovoltaic systems by 50% which at the time was the lowest possible installed price.

The ‘Boiler Magic’ project achieved a total of 1881 boiler installations. The rate of installations peaked in the second year of the project with 516 systems being installed. The greatest number of installation occurred in September 2001 and October 2002, during which 138 and 104 boilers were installed respectively (See Figure 5).

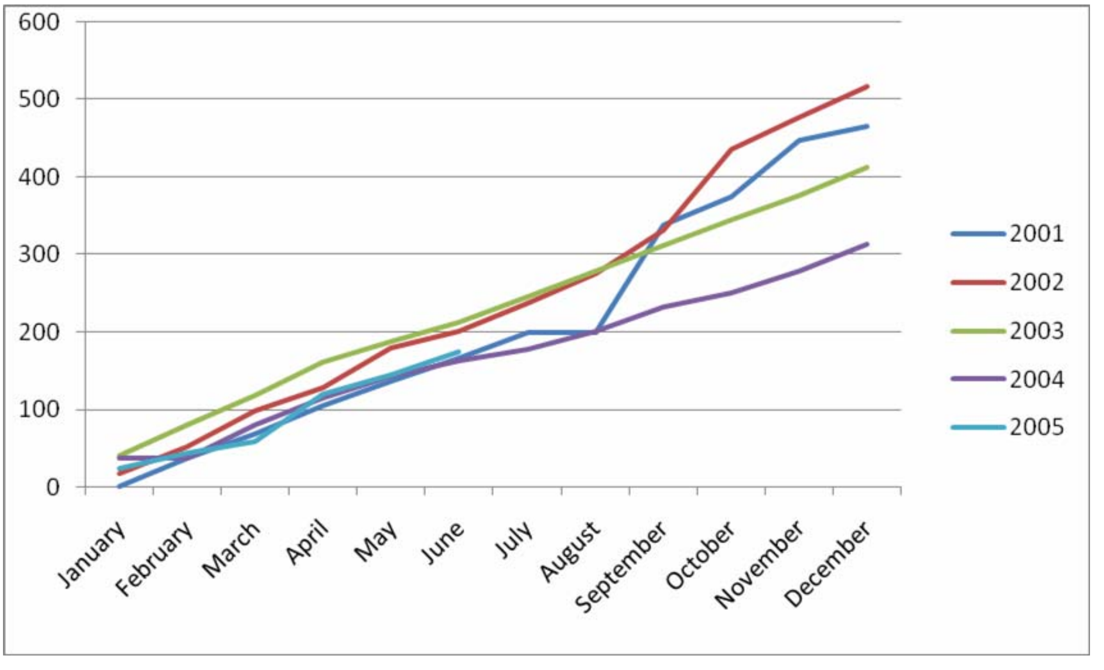

Figure 5. Graph showing annual rates of installation of boilers (2001 - 2005)

The influence of the sales in the months of September 2001 and October 2002 can be seen as the curves increase (Figure 5). These sales increases could be reasoned that during these months householders turned on their heating systems for the first time since the warmer summer months and encountered problems requiring them to be replaced. As this project was new to the area, householders applied to the project in larger numbers but in later years, with a greater awareness this peak was spread over the year. Statistical analysis using ANOVA was used to compare the annual adoption rates of high efficiency boilers but the result showed uniformity in the annual rates of adoption. In other words, there appeared to be no issues that could be causing a difference in adoption rates, year on year (See Appendix A for detailed results).

By contrast to the 1,881 boiler installations, the 'ChillOUT' project achieved a total of 13,852 installations. This is probably to be expected given that insulation can be purchased on an ad-hoc basis; there is not the same compulsion to purchase as is the case if a boiler had broken down. This was achieved despite the scheme operating for less time. The success of the scheme can be seen from the graph in Figure 6, where it can be seen that more installations were completed in the final six months of operation, than took place in the first 12 months. The graph shows that the rate of adoption fluctuates over the courses of the year, with a slowdown in installations in 2003-2004 during May to August, increasing September and thereafter.

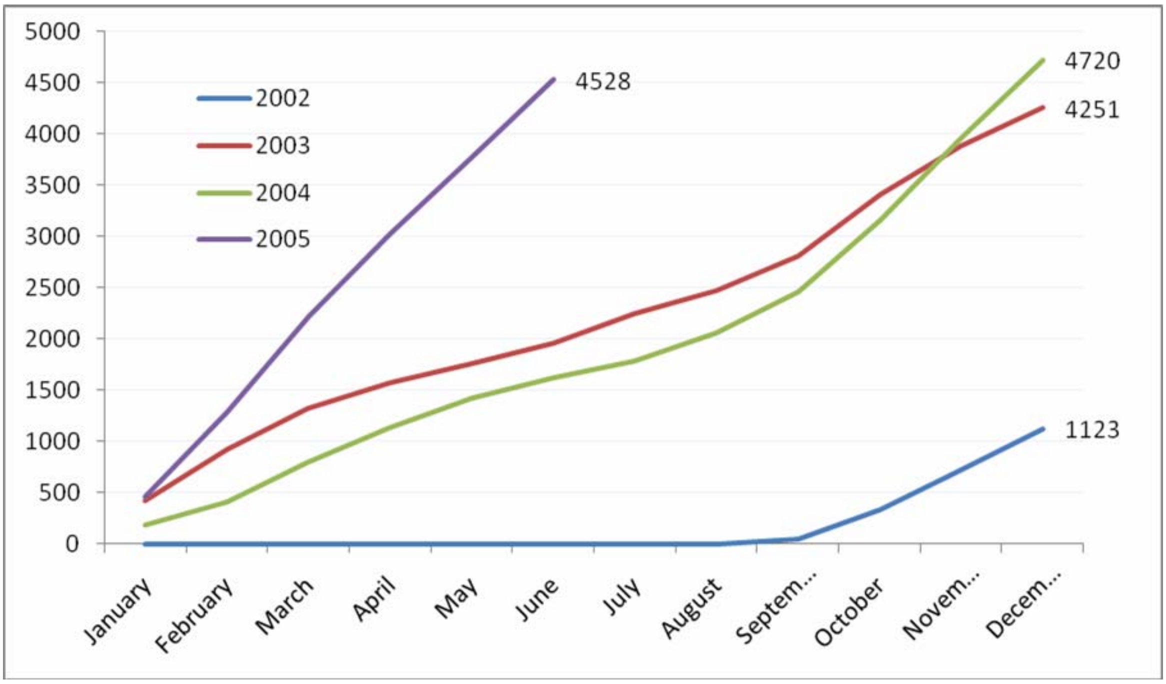

Figure 6. Graph showing cumulative annual sales for Insulation measures 2002-2005

Compared to installations achieved by the 'Boiler magic' and 'ChillOUT' projects, the number of installations recorded through the 'SolarPlan' scheme are negligible. In total, the project only recorded 210 installations over the 3.5 years of operation. Despite the number of installations being low however, the pattern and rate of adoption provides some useful insights (See Figure 7).

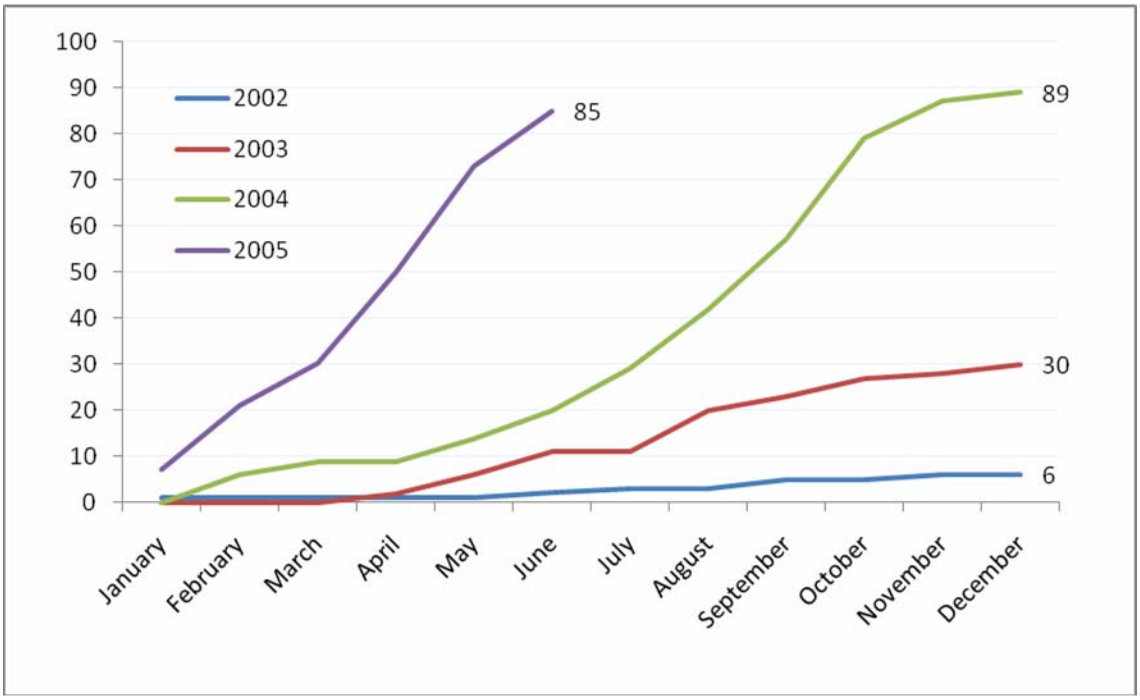

Figure 7. Annual installations of solar power technologies 2002-2005

Cumulatively, the data for the installation of solar power systems shows that in the early phases of the project, there were negligible installations but these increase in rate over the remainder of the project, with significant increases in the rate during the final 18 months of the project. Although the number of installations is nominal compared to insulation products, the pattern of adoption is similar. Indeed, correlation shows a 94% positive correlation (See Appendix B) between the two datasets.

Figure 7 illustrates the annual rate of adoption for solar technologies and highlights that seasonal influences may influence the installation of solar power systems; the curve for 2004 shows the rate of installation slowing considerably during October to December. However, given the size of the dataset, statistical analysis cannot support this hypothesis.

The dataset can however support analysis between the annual rates of adoption for each technology and does confirm that there are differences (See Appendix A). However, the causal factor for this is unknown. It is likely that a key factor is greater awareness of the technologies by the target markets for the technology. This would have been caused by the information campaigns generated by DDC. It is unlikely to be due to differences in the technology as during the time of operation, there were no significant developments in either the technology of the systems, or the technologies to install them.

In conclusion, the datasets show that:

- Between the three technologies, the volume of installations is highest for insulation products, then for boilers, and then solar technologies.
- The volume of adoption for solar power technologies is nominal.
- The rate of adoption between each of the technologies show a positively correlation but the strongest correlation is between boilers and insulation.
- The pattern of adoption between solar technologies and insulation is similar in that the rate of adoption in the final 6 months of the project was equivalent to, or greater than the first twelve months.
- Seasonal influences, particularly at the end of the summer months appear to positively impact the adoption of insulation and boilers, whereas the summer months record higher levels of adoption for solar power technologies.

These findings, whilst highlighting seemingly obvious conclusions are useful in that they provide a benchmark for future studies. The impacts of these results are discussed more broadly in Chapter 5.

4.3 Results of the Survey

This section details the results of the survey that was undertaken. The results of the survey include the results of initial interviews that were undertaken in order to determine heuristics for the survey form, as well as the later responses to the form, and the profiles of the respondents.

4.3.1 Development of the constructs

Ten of the eleven householders who had installed solar power systems through the Solarplan project were interviewed on a one-to-one basis. The interviews were conducted using the technique of triadic sorting to develop the list of bi-polar constructs that could be used to describe the solar power systems. Examples of the forms that were used can be found in Appendix C.

Despite the adopters being chosen at random, they shared similar demographic features and other values; they were retired or approaching retirement, and their primary motivation for adoption was focused on either financial or environmental aspects. All the interviewees indicated that they had a disposable income and were considering the long-term benefits of energy efficiency on their future financial position; solar was a method for reducing future expense when the interviewers had a potentially reduced income later in their retired lives. Environmentally, the key driver was the motivation to live sustainably.

The interviews each provided a number of useful bi-polar descriptors, which came total of 24 different bipolar adjectives or phrases, listed in Table 8.

Table 8. Bipolar constructs generated through triadic sorting.

Positive statement	Negative statement
Clean	Dirty
Reduces carbon emissions	Increases carbon emissions
Reduces pollution	Increases pollution
Safe form of power generation	Not a safe form of power generation
Could develop in the future	Probably won't develop in the future
Solar power is compatible with modern living	Solar power is not compatible with modern living
Will be more widespread in the future	Unlikely to become more popular
Generates savings	Does not generate savings
Home Improvement	Waste of money
Provides a visual statement of beliefs	Not a highly visible technology
Acts all of the time	Seasonal
Solar systems provide a comprehensive solution for hot water and electricity	Normal heating and mains power provides an adequate solution
Solar systems are an appreciating asset	Solar is a depreciating asset
The positioning of solar panels does not affect the visual landscape	The positioning of solar panels does affect the visual landscape
Maintenance free	Solar systems needs more maintenance than existing heating systems
Might help sell a house any faster	Does not help sell a house any faster
Adds value to a property	Does not add value to a property
The systems are hidden away	The systems are intrusive
Affordable technology	unaffordable technology
Simple to install in a property	Difficult to install in a property
Attractive	Unattractive
There is a high level of grant available	There is a low level of grant available
Solar has a long payback	Solar has a short payback
Natural	Man-made

As a result of the early adopters survey, the feedback suggested that the remaining Likert Scale was confusing. The section was reviewed and where appropriate, the repetitive points were deleted; the four remaining phrases (as can be seen in Table 9) were incorporated into the semantic differential table.

Table 9. Additional Descriptor Pairs added during the revision of the survey form.

Positive Statement	Negative Statement	Attribute Categorisation
Saves fuel	Does not save fuel	Relative Advantage
Toughened, Hard to break materials	Fragile and Exposed	Relative Advantage Compatibility
A greater flow rate when connected to a combination boiler (solar thermal)	No additional benefits	Relative Advantage Compatibility
Proven and Mature Technology	New, unproved technology	Relative Advantage

In total, 28 bipolar constructs were used in the survey form that was sent to the early majority. The constructs covered a range of issues, including economic and financial issues. In addition, the constructs described environmental, operational and aesthetic issues.

4.3.2 Response rates and profiles of Respondents

The survey was sent to two groups as described in the methodology chapter. Of the 100 surveys sent to the early adopters, 35 valid responses were received (35%). From the 1000 sent to the early majority, 420 responses valid responses were received (42%). This enabled statistical analysis to take place with confidence (95% Confidence).

The two groups of respondents shared some common features; predominantly, responses were received from males, many of whom described their occupation as ‘retired’, and most of whom lived either on their own or as part of a couple. The majority of the respondents had a ‘mains gas’ supply, which was expected as was the high level of households that had installed insulation (see Table 10).

Table 10. Demographic profiles of respondents from the two survey groups

Group	Sub-group	Early Adopters (%)	Early Majority (%)
Gender	Male	71.1	63.9
	Female	28.9	36.1
Age	18-35	9.3	13.1
	36-50	44.2	28.9
	51-65	30.2	36.2
	66+	16.3	21.9
Occupation	Retired	35.7	38.7
	Senior Management	7.1	11.6
	Professional	11.9	17.4
	Semi-skilled	35.7	27.4
	Not Working	9.5	04.8
No. of people at home	1-2	58.1	61.4
	3-5	39.5	37.9
	6+	2.3	00.7
Total Household income	0 – 14,999	27.0	23.3
	15 – 29,999	37.8	33.8
	30 – 44,999	18.9	30.0
	45+	16.2	12.9
House location	Urban	46.5	84.6
	Rural	53.5	15.4
Primary Fuel type	Electricity	12.2	05.4
	Oil	24.4	17.7
	Mains Gas	51.2	74.0
	Solid Fuel	4.9	00.9
	LPG	7.3	01.8
Cavity wall insulation fitted	Yes	59.5	80.4
	No	40.5	19.6
Loft insulation fitted	Yes	88.1	99.7
	No	11.9	00.3
Energy efficient boiler fitted	Yes	38.1	42.4
	No	61.9	57.6
Double glazing installed	Yes	78.6	88.6
	No	21.4	11.4
Solar Thermal installed	Yes	9.5	00.0
	No	90.5	00.0
Photovoltaic installed	Yes	4.8	00.0
	No	95.2	00.0

The two groups had differences on some issues however; the largest group of early adopters were in the age group 36 to 50, whereas the largest group of the early majority were in the age group 51-65. However, the early majority had nearly 4% more respondents in the age group 18-35. A greater proportion (8%) of the early majority had an income higher than 30k per annum than the early adopters. The early majority also had a much larger proportion of respondents that lived in an urban setting as opposed to a rural setting.

Some energy technologies had been installed, although in both groups, approximately 60% had not had an energy efficient boiler fitted. A higher proportion of the early majority had fitted cavity wall insulation and double glazing. Within the early majority group, cross-tabulation against income shows that more respondents had fitted loft insulation than cavity wall insulation, and more had fitted double glazing than energy efficient boilers. The next section details the responses to the heuristics within the semantic differential scale.

4.3.3 Results of attitudes to heuristics

The attitudes of both survey groups were statistically analysed using descriptive statistics, including simple classification and cross-tabulation and also a comparison of the mean scores that were applied to each of the ‘constructs. The responses were scored on a 13 point scale and are detailed within the appendices; for ease of reference, they are summarised in Tables 11 and 12, below.

Table 11. Values of returns and 95% CI levels for ‘constructs from the ‘Early Adopter’ survey.

Positive statement	Low CI	Mean	High CI	Negative statement
Safe form of power generation	1.24	1.60	1.97	Not a safe form of power generation
Reduces pollution	1.25	1.72	2.19	Increases pollution
Clean	1.24	1.91	2.57	Dirty
Will be more widespread in the future	1.59	1.98	2.37	Unlikely to become more popular
Could develop in the future	1.59	1.98	2.37	Probably won’t develop in the future
Solar power is compatible with modern living	1.59	2.05	2.49	Solar power is not compatible with modern living
Reduces carbon emissions	1.63	2.49	3.35	Increases carbon emissions
Home Improvement	2.32	3.12	3.92	Waste of money
Solar systems provide a comprehensive solution for hot water and electricity	3.56	4.38	5.20	Normal heating and mains power provides an adequate solution
Natural	3.23	4.53	5.84	Man-made
Provides a visual statement of beliefs	3.62	4.63	5.64	Not a highly visible technology
Generates savings	3.42	4.69	5.96	Does not generate savings
Acts all of the time	3.60	4.70	5.80	Seasonal
The positioning of solar panels does not affect the visual landscape	3.80	4.95	6.11	The positioning of solar panels does affect the visual landscape
Maintenance free	3.96	4.98	5.99	Solar systems needs more maintenance than existing heating systems
Solar systems are an appreciating asset	4.17	5.00	5.83	Solar is a depreciating asset
The systems are hidden away	4.37	5.24	6.11	The systems are intrusive
Simple to install in a property	4.24	5.32	6.40	Difficult to install in a property
Adds value to a property	4.47	5.37	6.27	Does not add value to a property
Might help sell a house any faster	4.80	5.70	6.60	Does not help sell a house any faster
Affordable technology	4.98	6.15	7.31	Unaffordable technology
Attractive	5.61	6.49	7.37	Unattractive
There is a high level of grant	6.23	7.31	8.39	There is a low level of grant available
Solar has a short payback	10.09	10.86	11.63	Solar has a long payback

Table 12. Values of returns and 95% CI levels for ‘constructs from the Early Majority survey

Positive statement	Low	Mean	High	Negative statement
Clean	1.84	2.07	2.3	Dirty
Reduces carbon emissions	1.91	2.12	2.33	Increases carbon emissions
Reduces pollution	1.94	2.23	2.52	Increases pollution
safe form of power generation	2.08	2.27	2.46	Not a safe form of power generation
Saves fuel	0.5	2.6	4.7	Does not save fuel
Could develop in the future	2.66	2.88	3.1	Probably won’t develop in the future
Solar power is compatible with modern living	3.24	3.49	3.73	Solar power is not compatible with modern living
Will be more widespread in the future	3.4	3.66	3.92	Unlikely to become more popular
Generates savings	3.57	3.88	4.19	Does not generate savings
Natural	0.33	4.29	8.25	Man-made
Home Improvement	4.16	4.46	4.77	Waste of money
Toughened, hard to break materials	1.84	4.55	7.26	Fragile and exposed
Provides a visual statement of beliefs	4.78	5.1	5.42	Not a highly visible technology
Acts all of the time	4.77	5.17	5.57	Seasonal
Proven and mature	2.5	5.39	8.28	New ‘unproved’ technology
Solar systems provide a comprehensive solution for hot water and electricity	5.25	5.59	5.94	Normal heating and mains power provides an adequate solution
Solar systems are an appreciating asset	5.29	5.65	6.00	Solar is a depreciating asset
The positioning of solar panels does not affect the visual landscape	5.99	6.4	6.81	The positioning of solar panels does affect the visual landscape
A greater water flow-rate when connected to a combination boiler	3.76	6.43	9.1	No additional benefits
Maintenance free	6.09	6.43	6.78	Solar systems needs more maintenance than existing heating systems
Might help sell a house any faster	6.07	6.43	6.78	Does not help sell a house any faster
Adds value to a property	6.39	6.73	7.08	Does not add value to a property
The systems are hidden away	6.59	6.97	7.35	The systems are intrusive
Affordable technology	6.9	7.23	7.56	Unaffordable technology
Simple to install in a property	6.91	7.23	7.55	Difficult to install in a property
Attractive	7.91	8.24	8.57	Unattractive
There is a high level of grant	8.15	8.5	8.85	There is a low level of grant available
Solar has a short payback	9.6	9.9	10.2	Solar has a long payback

The results show that the same constructs were ranked in the top four most positive scores for both groups, albeit in different order. The ‘early adopter’ group did return slightly more positive scores for the constructs but this is to be expected as they have decided to physically adopt the technology. Conversely, both groups also scored the same four constructs the least positively. Three of the four constructs related to the economics of the technology, and one related to the aesthetic value of the systems on the roof.

Differences were found within the sub-groups of the ‘early adopter’ survey; more respondents from households with incomes over 50k per annum responded that solar power was unaffordable, with a lower level of grant was available, and that solar was unattractive than those with incomes under 50k. On the other hand, households with electricity as their main heating fuel thought that solar power was affordable compared to those households with mains ‘gas’ as their main source of energy. The same households also thought that solar power was more of an appreciating asset than the respondents from households with mains gas.

Within the responses of the early majority survey group, the results showed consistency within sub-groups; for example, males indicated more positively to the construct regarding the reduction of carbon emissions than female respondents (1.96 vs. 2.45). Females on the other hand indicated more positively to solar technologies being an appreciating asset (4.93 vs. 5.95), and that it is a ‘home improvement’ (3.88 vs. 4.78).Females also indicated more positively to the impact of solar on the visual landscape (5.78 vs. 6.69).

Other responses in the ‘Early Majority ‘sub-group indicated that the ‘Over 50’s’ were less positive towards the ‘attractiveness’ of solar technology than those under 50 (8.55 vs. 7.83), and the same group was less positive than the age group ‘36 to 50’that solar was less likely to affect the visual landscape (6.17 vs. 7.81). Households with incomes under 50k thought solar more of an appreciating asset, compared to those over 50k who tended towards the negative statement (5.54 vs. 6.82). This was despite households with incomes over 50k responding more positively to the descriptor that solar reduced carbon emissions (2.08 vs. 1.13). Rural households responded more positively towards solar technology being an appreciating asset than urban households (4.78 vs. 5.85), this is possibly due to those in rural areas being dependent on higher priced energy supply.

4.3.4 Results of responses to the decision statements

The second key element of the survey work was to understand the priority that householders put on attributes of innovations in their adoption process. Rogers (2003) generalises that the attribute category of ‘relative advantage’ will be the most influential in the decision making process. This generalisation is comparable to that of the ‘Rational Choice’ paradigm, in that consumers are proposed to be ‘constrained maximisers’ and consumption decisions are based on maximising economic rewards. Other researchers have disputed Rogers’ generalisations, claiming for example other attribute categories are more important in the decision making process (e.g. Bhate and Lawler (1997), and Pujari et. al. (2003)). A critical discrepancy is that the generalisations in Rogers (2003) ‘Innovation Attributes’ model closely follow the process of ‘perfect rationality’, which itself has been disputed; consumers instead being guided by heuristics and following a process of ‘bounded’ rationality (e.g. Yang and Lester (2008); van den Bergh (2000); Jackson (2004); Lovett (2006)).. Therefore, it follows that if the generalisations are correct in the Diffusion of Innovation theory, the attribute of ‘Relative Advantage’ will always be the most influential attribute category. The responses to the ‘decision priority statements’ are listed in Table 13, below. The response to the questions highlight that approximately 93% of all respondents agree with the statement that the advantage and benefits of the technology are the most important to an adopter. This was the most emphatic of all the responses.

Table 13. Results of the Decision Priority Statements

	Advantage and Benefits most important		Only if it works with what I have		Knowing a product fits with my lifestyle is more important than trying it first		Too complex, likely to discourage		Not seen before, less likely to buy		Try it first more likely to buy	
	T	F	T	F	T	F	T	F	T	F	T	F
Early Adopters	93.02	6.98	56.10	43.90	42.86	57.14	51.22	48.78	22.50	77.50	73.17	26.83
Early Majority	92.46	7.54	73.96	26.04	33.73	66.27	63.69	36.31	59.76	40.24	95.94	4.06
	Key: T=True F=False											

Two statements were used to test the attribute of ‘compatibility’, and interestingly, these two statements attracted opposing results. 56% of the respondents stated that they would adopt an innovation if it worked with their existing system; however, they were less positive to the statement that knowing a product was more important than trying it first; in other words, trialling a product would be more important to a majority of the group than knowing it was compatible with their lifestyle.

The response to the statement related to the ‘complexity’ of innovations, often seen as a limiting factor highlighted an almost even group of early adopters who responded that the statement was true, as those who stated it was false. On the other hand, the ‘early majority group appeared more conservative, with an approximate 65 true: 35 false ratio of responses. This indicates that early adopters may be more likely than the early majority groups to tolerate complexity. The responses regarding ‘observability’ was not as expected for the early adopters in that only 22% of respondents indicated that the statement ‘If I had not seen the technology before, I would be less likely to buy’ was true; this compared to almost 60% of the early majority group.

Cross tabulation was carried out on the results in order to understand if any significant differences occurred between demographic sub-groups. All areas where differences occurred between the sub-groups are listed in Table 14. In summary;

- A greater proportion of the age group 36-50 disagreed with other age groups when asked if they would adopt an innovation if they had not seen it before; in other words, this age group shows a greater propensity to buy an innovation without having seen it before.
- A greater proportion of the group earning more than 45k per annum disagreed with other income groups when asked if they would adopt an innovation if they had not seen it before; in other words, this income group shows a greater propensity to buy an innovation without having seen it before.
- A greater proportion of the group of people occupied in senior or managerial professions disagreed with other occupation groups when asked if they would adopt an innovation if they had not seen it before; in other words, this profession shows a greater propensity to buy an innovation without having seen it before.
- There was an even number within the age group 36-50 who stated that if an innovation was too complex, it would discourage them from adopting it. In other words, this age group shows a greater propensity to adopt an innovation regardless of its complexity.

Table 14. Differences within sub-groups on the decision making process statements

Survey group and Statement	**Sub-group**	**% True**	**% False**
Early Majority Survey: Age Sub-groups Not seen before, less likely to buy	18-35	**56.82**	43.18
	36-50	41.24	**58.76**
	51-65	**66.39**	33.61
	66+	**75.34**	24.66
Early Majority Survey Income groups (£K p.a.) Not seen before, less likely to buy	0-14.9	**77.03**	22.97
	15-29.9	**58.10**	41.90
	30-44.9	**57.14**	42.86
	45+	34.15	**65.85**
Early Majority Survey: Occupation Type Not seen before, less likely to buy	*Retired*	**73.50**	26.50
	Senior / Management	48.57	**51.43**
	Professional	**51.92**	48.08
	Semi Skilled	**51.19**	48.81
	Not working	**60.00**	40.00
Early Majority Survey: Age Sub-groups Too complex, likely to discourage	18-35	**59.09**	40.91
	36-50	50.00	50.00
	51-65	**71.54**	28.46
	66+	**70.42**	29.58

The innovation decision process, as prescribed by Rogers follows a step-wise approach of knowledge, persuasion, decision, implementation and confirmation. Rogers (2003) proposes that all adopters follow this process, albeit over different durations; adopters follow the process faster than laggards. The results show that the step-wise process placing priority on attributes for decision making is followed by a majority of the group. However, there are anomalies which occur depending on the attribute they are considering. The attribute of ‘relative advantage’ appeared to show the highest level of importance, with the remainder of attributes decreasing in importance of impact on decision. For example, the process was followed through with each respondent, and nearly a third of the group would have decided to adopt based on the ‘relative advantage’ and ‘compatibility’ attributes.

Table 15. Respondants following the Innovation Decision Process

Responses	Relative Advantage	Compatibility	Compatibility	Complexity	Observability	Trialability
	321 (yes)	Of which	Of which	Of which	Of which	Of which
Yes	321	230	83	64	47	46
No	24	82	143	18	17	1
Missing	2	7	4	1	0	0
	%	%	%	%	%	%
Yes	92.46	72.10	36.08	77.10	73.43	97.87
No	6.96	25.71	62.17	21.69	26.56	2.13
Missing	0.58	2.19	1.74	1.20	0.00	0.00

Table 15 shows that a diminishing proportion follows through the entire process as presented by Rogers (2003). Of the useable responses, 92.46% responded that relative advantage would be the most important. Of that group of respondents, 72.1% agreed with the first statement of compatibility, but only 36% of that group agreed with the second response.

This chapter has presented the results of:

- Analysis of sales data of energy efficiency and solar power technologies
- Development of a series of constructs describing heuristics of solar power
- Analysis of a survey of householder attitudes to solar power
- Analysis of a survey to understand householder adoption decision processes

These results are taken forward to the next chapter as the basis from discussion.

5 Discussion

The discussion chapter provides a critical review of the research programme, including a discussion of the findings from the case study. This includes a comparison of the findings to the literature, an evaluation of the methodology and issues that could affect the value, reliability, and validity of the final research outcomes.

This discussion section focuses on each of the objectives set for the thesis and draws on the findings from the primary research, as well as the previously researched information available from the literature.

5.1.1 *To identify differences in the rate of adoption between energy efficiency and solar power technologies in the UK domestic sector*

In 2005, the Buildings Research Establishment (BRE 2005) published conclusions on the future adoption of energy efficiency technologies, which also included data on the rate of adoption for a number of efficiency measures, including boilers and insulation. The BRE results however, do not give any indication into the future adoption of any micro-generation technologies. Other literature shows that over time, the use of solar thermal and photovoltaic systems has increased slowly. In respect of solar thermal systems, an estimated 63.4 GigaWatt hours (GWh) installed capacity has replaced the need for gas heated domestic hot water generation; and the installed capacity of photovoltaics has increased from 8.2 MW in 2004 to10.9 MW in 2005 and 14.3 MW in 2006. (BERR 2008). However, the increase in photovoltaics has been due to commercial rather than domestic application of the technology (BERR 2008).

Hence, the analysis of the adoption data from the DDC projects added to the available literature in the following ways:

- Confirmation of the patterns of adoption of energy efficiency technologies
- New insights into the patterns of adoption of solar technologies

The data for the projects shows that the rate of adoption for solar power systems is increasing over time, but the numbers of installed systems remains low compared to insulation and high-efficiency boilers. Over the period between 2002 and 2005, the SolarPlan ‘project’ recorded a total of 210 installed solar power systems. This compared to 4258 installations of insulation, and 1881 installed boilers.

Over time, the annual rate of adoption for solar power systems was different for each year of the SolarPlan ‘project’ operation. The causal reasons for this difference could not be determined due to the low volume of data, but the results indicate that growing awareness of the technology through marketing activities, a growing number of householders decided to install the systems.

Rogers (2003) proposes that the ‘time’ element of the diffusion process allows the diffusion curves to be drawn, and to identify adopter categories. Rogers proposes that the rate of adoption can be represented by ‘Normal Distribution’ using the bell shaped frequency curve, or the ‘S’ shaped ‘cumulative’ curve. Rogers (2003) proposes that diffusion curves rise slowly at first, accelerating until half of the individuals have adopted [the innovation in question], and then levelling out as the final individuals adopt [the innovation].

Figure 8 presents the 'S' curves for a range of energy efficiency technologies and the cumulative rate of adoption until 2050. The conclusions suggest that over the period between 2010 and 2050, cavity wall insulation will continue to be installed at a steady rate achieving saturation as the period comes to an end. Other technologies will reach a point of saturation before this time, e.g. hot water tank insulation and loft insulation. Further, central heating systems and draught proofing are likely to be adopted at a faster rate than cavity wall insulation. The 'S' curves for cavity wall and high efficiency boilers differ in that the rate at which the technologies are adopted is more rapid for high-efficiency boilers than for cavity wall insulation. This is due to the fact that whilst cavity wall insulation is a technology that is unlikely to develop, high efficiency boilers were new to the market in the year 2000, and therefore, will not have been available to adopt prior to this date (BRE 2005; Shorrock 2005).

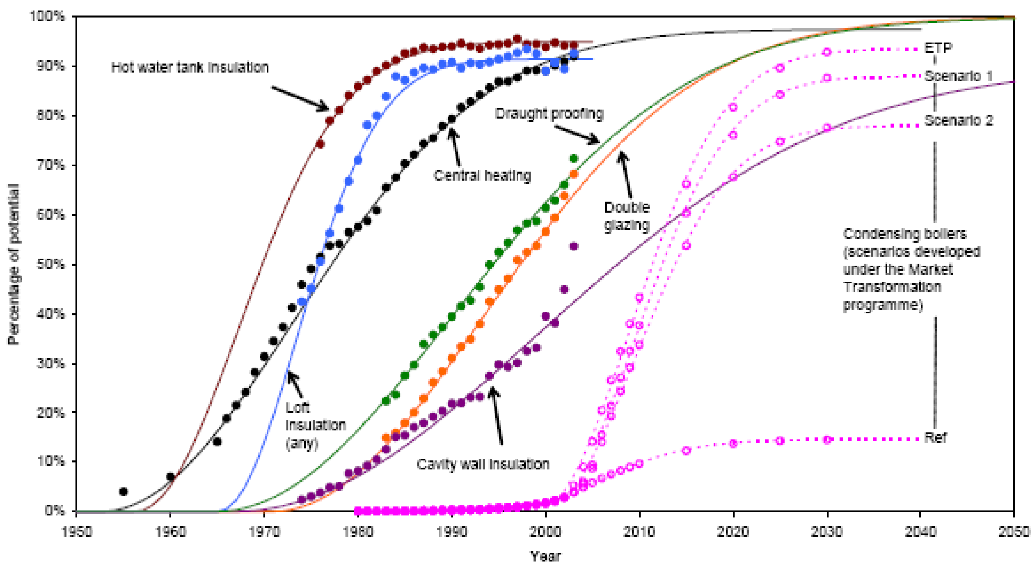

Figure 8. Projections of Technology adoption (Shorrock 2005)

Figure 9 illustrates the adoption curves for solar power systems from the DDC projects, which, given the low volume of data illustrates an 'S' curve less clearly. The curve for solar power reflects the initially slow rise and the accelerated increase as the number of adopters increase.

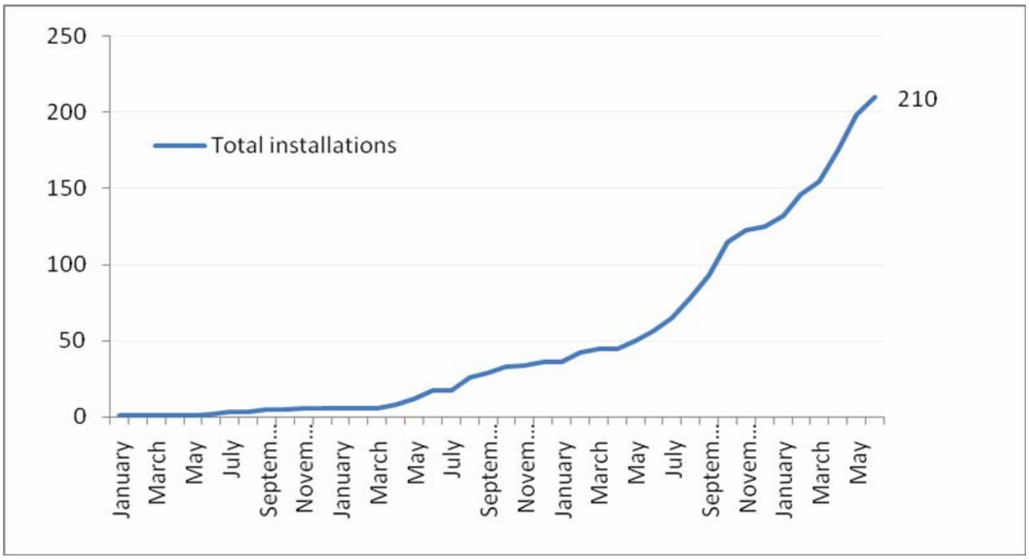

Figure 9. Graph showing cumulative sales of Solar Power systems 2002-2005

However, the curve is not consistent as it increases; for example during the final months of the project, the rate of adoption fell between the months of November to January. This may be due to seasonal factors as these months are typically darker and colder than other months. In addition, potential adopters could be saving or diverting their resources to spend on other activities (for example, presents at Christmas). In addition, the rate at which the 'S' curve increases does not begin to decelerate. This may be due to the reason that the number of adopters has not been 'exhausted' and therefore, if the Diffusion of Innovations theory holds true, further installations can be expected.

The differences in the rate of the adoption can therefore be summarised that firstly, the volume of systems installed is significantly different, with solar power technologies providing the lowest volume. Secondly, there appears to be seasonal factors that might be affecting when solar systems are adopted, as the majority of solar systems being adopted either just prior to, or during the summer months.

Given the data reported in the literature, intuition almost leads to these two conclusions, however, it is worthy of note that the demographic information provided from the surveys. Rogers (2003) makes a generalisation that age is not a useful indicator for innovativeness. In this research, the ‘early adopters’ group, who had enquired about solar technologies, had a greater proportion of respondents in the younger age category(age 36-50), whereas the ‘early majority’, who were known adopters of energy efficiency technologies had a larger proportion in the ‘older’ age categories (51+). However, the adopters that were interviewed and had actually installed solar technology were all in the older age group (51+). Further to this, Rogers (2003) generalises that the earlier adopters are better placed to deal with risk, which would be borne out as the actual adopters were installing to reduce their future risks (for example, higher energy prices and low maintenance systems). An implication therefore, is that if solar technologies could be marketed together with energy efficiency products, it might increase the rate of adoption.

5.1.2 To identify the heuristics that consumers use in their adoption decisions regarding solar power technologies

The third objective sought to identify the heuristics that account for consumers’ adoption decisions regarding solar power technologies. Some literature has stated that factors such as ‘cost’, ‘environmental certification’ and ‘public perceptions of the environmental impacts’ are critical (Rowlands et. al.2002). However, the literature is limited in relation to the results of energy uses related to solar power in a domestic situation.

The literature on consumer behaviour highlights that a broader set of factors needs consideration, for example rational choice processes (Lovett 2006, Schotter 2006), values and attitudes (Stern et al. 1999; Chiu 2005), learning and cognition (Zinkhan and Braunsberger 2004; Rowlands et al. 2002), cognitive consistency and dissonance (Jermias 2001), as well as a number of social and norming theories.

The survey provided some useful additional insights into the factors that account for consumers adoption decisions regarding solar power technologies, each of which is discussed below;

- the heuristics householders use for solar power systems
- the attitude that both adopters and non-adopters have to solar technologies
- the influence of the attribute categories on the decision process

The adopters that were interviewed generated a series of 23 construct pairs, which, using the triadic sorting method articulate how they view solar technologies. These heuristics can be categorised as environmental issues, economic issues, operational issues, and aesthetic issues. For the most part, some of the heuristics might be considered to be stating what is known from the literature, but there are some useful insights from this approach. The environmental issues included constructs related to the reduction of pollution and carbon emissions, and the economic issues included those related to appreciation, savings and payback. However, slightly more surprising was the construct that solar might help to sell a house faster [than a house without solar]. This suggests that some adopters might have installed the systems as an additional feature, considering the cost of the technology was equal to, or less than the cost of other factors that could improvement the speed at which a house sells.

Operational issues relate to factors that describe how the systems operate in the home and there are two constructs that could be used to summarise the operational issues; ‘compatibility with modern living’ and whether or not solar technologies provide a comprehensive solution for heating and hot water. Other factors arose, ‘seasonality’, ‘maintenance’ and simplicity to install’ are all issues that are considered by adopters. In addition, operational issues also seemed to extend to more obscure factors such as the safety and cleanliness of the systems,

The ‘aesthetic’ issues articulate how the respondents describe the visual impact of the systems; the terms generated included attractiveness, intrusiveness, and visibility of the technology. Some of the constructs are more difficult to categorise, but indicate some interesting findings. For example, that the early adopters do consider future developments in the systems, and how widespread the technology will become, although this has obviously not prevented them from adopting the technology.

Table 16. Comparison of Constructs relevant to Solar Power Systems

Category (from Caird et al. (2008)	Variable from Caird et al (2008)	Positive Construct (derived from this Thesis)
Drivers for Adoption	Saving energy	Generates savings
	Postive communication from friends	
	Environmental concern	Reduces pollution
	Funds available	There is a high level of grant available
	Affordable after grant	Affordable technology
	Try out innovative technology	
Barriers to Adoption	Too expensive	
	Likely fuel savings not worth cost	Solar has a long payback
	Difficulty in finding reputable supplier	
	New technology with uncertain performance and reliability	
	System not likely to last long enough to payback	Solar has a long payback
	Incompatibility with hot water	Solar systems provide a comprehensive solution for hot water and electricity
	Difficulty finding suitable location	
	Expected disruption in home	
Benefits experienced in use	Satisfied	
	Pleasure of using a renewable energy	
	Lower fuel bills	
	Greater energy efficiency	
	Greater concern about energy saving	
Problems experienced in use	Poor reliability about components	
	Solar hot water not usable in cold fill appliances	
	Insufficient solar heated water	
Rebound effects	No behaviour change to use available hot water	
	Less concerned about using solar hot water	

By means of comparison, Caird et al. (2008) carried out survey interviews with 14 individuals in order to develop a range of ‘variables’ that influenced the adoption decision. The resulting variables were categorised differently; whether or not the variable was considered a ‘driver’ or a ‘barrier’ to adoption, whether it was ‘benefit’ or a ‘problem’ in use, or whether it described a behaviour that illustrated the ‘rebound’ effect. As the respondents to Caird et al (2008) had either not installed or not long installed systems, the ‘variables’ were mostly incommensurable with those generated by the early adopters. As can be seen from the results in table 16, there were only five constructs from the ‘early adopters that were directly similar to those from Caird et al (2008).

Respondents to both surveys indicated positive attitudes to many of the constructs of solar power technologies. In particular to environmental issues such as solar being a safe form of power generation, the ability to reduce pollution by using solar technology, and the technology being perceived as clean. This corresponds to other research (e.g. Viklund 2004), who concluded that consumers view solar power systems more favourably that conventional forms of power generation.

Rogers (2003) proposes that with the exception of attributes that describe how ‘complex’ an innovation may be, all others attributes of innovations positively influence the ‘rate’ of adoption. Further, attributes that describe an innovations’ ‘Relative Advantage’ are the most influential. This is a proposition that is supported by other researchers (e.g. Smizgin and Bourne 1999; Aggarwal et al. 1998) and which finds support through this research. Many of the constructs articulated by the early adopters describe the ‘relative advantage’ of solar power and many of these had positive responses ascribed to them (e.g. clean technology, reduces pollution). There were other constructs which generated a less positive response, but still positive nonetheless, regarding installation, visual aspects, and certain financial aspects such as the affordability of the systems. Definite negative responses were indicated for the 'payback' of the systems.

The Diffusion of Innovations theory makes generalisations regarding the propensity of an individual to favour of innovation based on socioeconomic characteristics of adopters regarding age, education, literacy, social status, social mobility, and ownership of units. However, the findings from this research suggest that there is not always consistency between groups; for example whereas Rogers suggests that earlier adopters are no different in age to later adopters, the survey identified that the older age groups were less positive to three of the constructs. Whether or not these differences will impact on the adoption process is unclear but it may be relevant to marketing activities. In addition, there were differences between the demographic profile of the early adopters and the early majority such that the early adopters were skewed to younger age groups, and with lower incomes.

The results of the investigation into the innovation decision process found that most respondents placed the greatest level of importance on 'Relative Advantage', a finding concurrent with the innovation attribute framework (Rogers 2003). However, almost 7% of the early adopters and 7.5% of the early majority did not follow this decision route; despite this being a small proportion of the overall sample, it is worthy of note as it demonstrates 'irrationality' in the decision making process, in line with the criticisms of 'Rational Choice' theory (e.g. Lovett 2006).

If as the results show, that wealthier households are likely to be less favourable to solar power technologies then the costs of the technology are going to play a key factor in limiting adoption. Hence, future developments of the technology, including installation and revenue costs will have to focus on reducing prices in relation to other sources of energy. On the other hand, if households using electricity as a heating source are more favourable to solar power, this could indicate an opportune market; there is a higher cost involved in using electricity compared to gas. In addition, households not on the mains gas supply often occur in rural areas where energy supplies could be intermittent. Hence, if the technologies were able to offer greater security of constant energy supply, this might influence the economic factors of cost and appreciation.

5.1.3 To explore whether or not a chasm exists between earlier and later adopters of domestic solar power technologies

This objective sought to explore whether or not a chasm exists between earlier and later adopters of domestic solar power technologies. The chasm was proposed by Moore (1999) but no empirical evidence has been found that exists for innovations other than those in the high-tech sector.

A comparison was made of the decision making process between the two groups; this is presented in the next section. Over 90% of the respondents from both survey groups indicated that the first statement relating to advantages and benefits being the most important factor is ‘true’. A larger proportion of respondents also indicate that second, third and fifth statements are true as opposed to false. However, a larger group of respondents indicate that the final statement regarding the compatibility of products and lifestyles is false, and the two survey groups disagree on the statement regarding the need to see a product before purchase (see Table 17).

Analysis of the figures shows that a significant difference occurred between three of the six statements, which relate to compatibility, observability and trialability. The statement regarding observability suggested that the ‘early adopters survey group’ disagreed with the early majority survey group’ suggesting that as innovators, they would more likely purchase an innovation regardless of whether they had seen it before. The other two statements, regarding compatibility and trialability indicate different levels of agreement between the survey groups. The early majority group showed a higher agreement level than the early adopters group in both situations, and the greatest difference in agreement level was regarding compatibility. Future research may be carried out here to clarify the position of the early majority group, but this evidence suggests the group are less likely to take risks in their innovation-adoption process.

Table 17. Table showing the responses to the adoption statements for both survey groups.

	Advantage and Benefits most important		Only if it works with what I have		Knowing a product fits with my lifestyle is more important than trying it first		Too complex, likely to discourage		Not seen before, less likely to buy		Try it first more likely to buy	
	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
early adopters	93.02	6.98	56.10	43.90	42.86	57.14	51.22	48.78	22.50	77.50	73.17	26.83
early majority	92.46	7.54	73.96	26.04	33.73	66.27	63.69	36.31	59.76	40.24	95.94	4.06

Hence, there are differences in the strength of the response between the two adopter groups but there is only one statement on which the two groups disagree; this relates to ‘observability’ where the later adopters would appear to be less likely to buy the systems if they had not seen them in popular use.

There are some statistically significant differences between the early adopters and the early majority regarding some constructs. This indicates the presence of the chasm, which could be preventing later adopters adopting the innovation. However, the differences in returned values often indicate a difference in the strength of the attitude, rather than suggesting an opposing attitude. The bipolar adjectives or phrases where this occurs are generally related to the operational and financial issues of the products e.g. the level of grant, simplicity to install and maintenance features, and observable features such as the aesthetics, and attractiveness (as seen in Table 18). Please note that for ease of reference, the responses have been categorised as ‘positive’, ‘negative’ and ‘don’t know’ depending on the strength of response.

Table 18. Significant differences in returned response value

Construct	**Early adopter Survey mean score**	**Early Majority Survey mean score**	**Early Adopters group response**	**Early Majority Group response**
Safe form of power generation	1.60	2.27	Positive	**Positive**
Complete solution	4.38	5.59	Positive	**Positive**
Home improvement	3.12	4.46	Positive	**Positive**
Could develop in the future	1.98	2.88	Positive	**Positive**
Will be more widespread in the future	2.07	3.66	Positive	**Positive**
Solar power is compatible with modern living	2.05	3.49	Positive	**Positive**
The systems are hidden away	5.24	6.97	Positive	**Don’t know**
Simple to install in a property	5.32	7.23	Positive	**Don’t know**
Maintenance free	4.98	6.43	Positive	**Don’t know**
Does not affect the visual landscape	4.95	6.40	Positive	**Don’t know**
Affordable technology	6.15	7.23	Don’t know	**Don’t know**
Attractive	6.49	8.24	Don’t know	**Negative**
There is a high level of grant	7.31	8.50	Don’t know	**Negative**
Solar has a short payback	10.86	9.90	Negative	**Negative**

Figure 10 presents a graphical illustration of the differences between the two survey groups.

Key: Early Adopters Survey (Light shade) Early Majority survey (Dark shade)

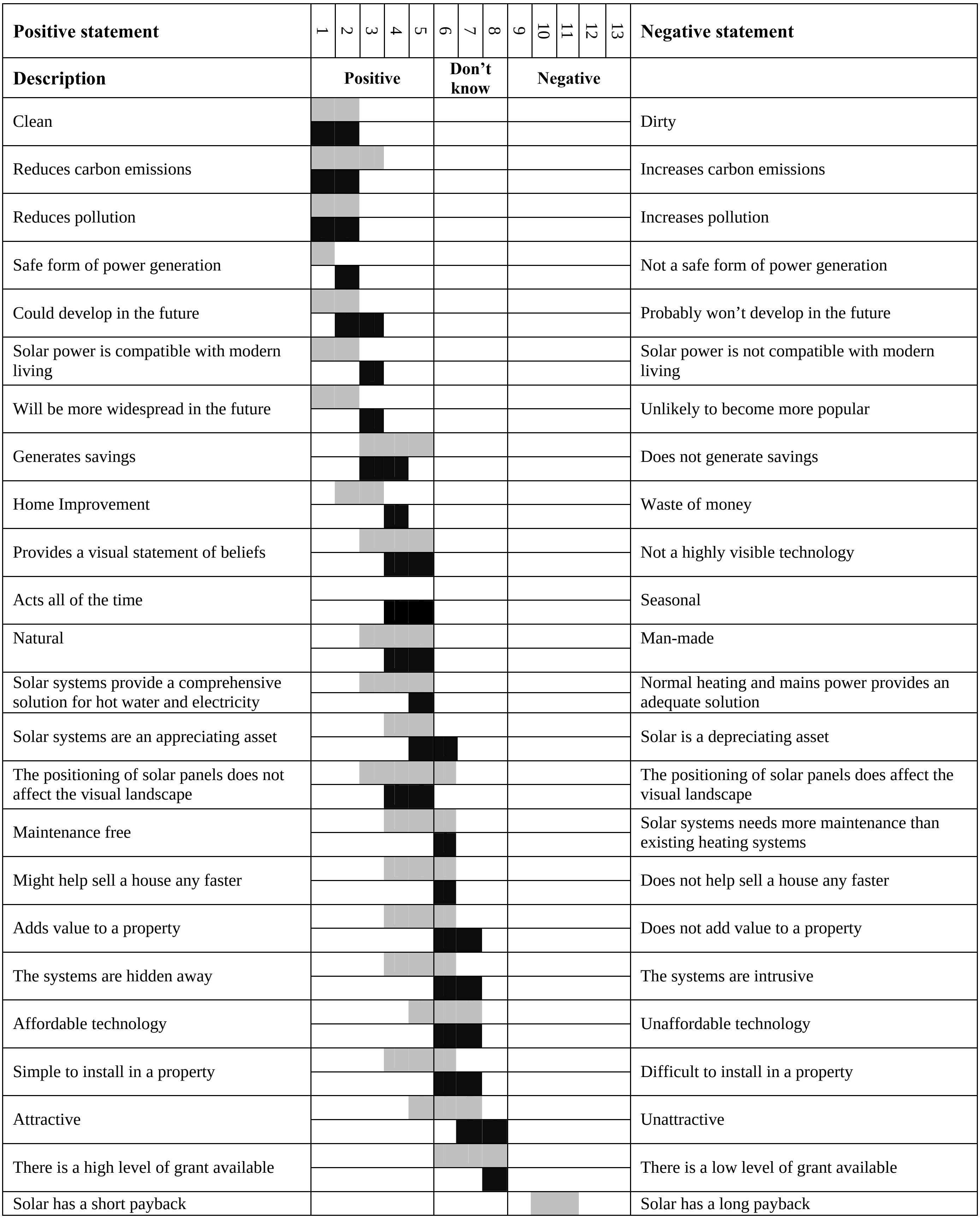

Figure 10. Graph indicating the spread of responses from each survey group.

In relation therefore to the heuristics, the chasm consists of seven constructs;

- Solar being unattractive
- Grant levels
- Solar not being hidden away
- Solar not adding value to a property
- Solar affecting the visual landscape
- Not being maintenance free
- Solar not being simple to install

In addition, the chasm will also include the factor that later adopters need to see the technology being in popular use.

Moore (1999) writes about the early majority; "*the early majority want to buy productivity improvements for existing operations*". Considering each of the constructs suggests that the improvements that householders are looking for over and above their existing water heating, or electricity generation are systems that are attractive and unobtrusive, simple to install and maintenance free. In addition, the householders are looking for 'reasonable' pricing, which may be subsidised through grant levels, and systems that will add 'value' [financially] to a property. The challenge, as Moore (1999) suggests is that the early majority will not use the early adopters as a reference point for adopting the innovation, therefore, the agency promoting the innovation need to find an '*upstanding member of the early majority community to provide references to the others!*'(Moore 1999).

5.1.4 To identify policy relevant insights into the adoption of solar power technologies in the UK domestic sector

The UK government has set a policy to '*see renewables grow as a proportion of our electricity supplies to 10% by 2010, with an aspiration for this level to double by 2020* (DTI 2007). This policy is relevant to all renewable technologies, which includes solar thermal and photovoltaic technologies. However, as the response from the early majority survey has shown, the pragmatic majority still concur with earlier findings that the barriers to widespread adoption of solar power technologies include long payback periods for the householder, high capital costs and a lack of confidence in the long-term performance of the systems (BRECSU 2001, ETSU 2001; Timilsina 2000).

Drucker (1979) identifies a central relationship in the innovation process between three parties; government, academia and independent business. In order for innovation to occur in a manner that will have long term benefit, there needs to be an interdependence and trust between these three parties with a continual view on long term sustainability. Drucker quotes examples of where certain actions, for example industrial taxation by government, which causes industry funding to focus on short term gain rather than long term, which in turn affects the scientific research necessary for industry to gain long term market advantage. Hence, policy should be able to facilitate innovation, by means of either market or legislative intervention. Energy policies globally contrast heavily depending on the local politics and regional situations; for example, the policy of 'demand and provide', which often leads to an increase in oil production in order to increase gross domestic profit (Wilson Center 2007), or the policy of 'Low carbon' economy, where growth is decoupled from increased use of carbon in industry (DEFRA 2006). The effects of policy can have a sustained impact, for example, the use of biomass in energy production was not given any policy support and as a consequence localised efforts to develop the technology and diffuse it into general use failed (Clift 2005).

The following section outlines how policies could be implemented to operate at three levels:

- A strategic governmental level whereby legislation is used to influence adoption
- Policies implemented by local authorities to influence adoption through routes such as education and information
- Policies implemented by the commercial sector seeking to sell solar systems

At a strategic level, the administration in the Netherlands sought to further the adoption of ‘green’ energy products and their use by developing a virtuous circle whereby funding to stimulate the market increases demand for products. As a result, there was a total increase of 675,000 customers for green energy between 1995 and 2002, with premiums for green electricity falling to in some cases either zero premium or even green electricity cheaper than electricity generated by conventional fossil fuel based processes (Bird et al 2002).

Despite the RCEP (2000) concluding that the role of renewables in energy policy was limited by the superiority of other technologies, UK policy has a mechanism known as the Renewables Obligation (RO), which provides an incentive for producers of renewable energy to either, source or procure renewable energies, or to pay suppliers a ‘buy-out’ price. Critically, Foxon and Pearson (2007) suggested that up until 2006, the RO had failed to allow technologies that were not market ready to develop to a point where they were commercially viable, that it failed to stimulate long-term thinking, and that it favoured a short-term efficiency rather than long-term thinking.

Almost in answer to the critics (e.g. Foxon & Pearson 2007; Clift 2005), the 2007 white paper included specific reference to heat generation and banding the Renewables Obligation. A number of methods for clean production are discussed including the development of hydrogen as an energy source, micro-generation, and combined heat and power systems (DEFRA 2006).The policy may assist potential innovation of solar technologies through various routes, such as improved legislation enhanced tax incentives to encourage initial development larger scale renewable sources , and also by improving the ability to generate renewable energy and trade ‘carbon offsets’ on the market.

Graham & Williams (2003) concluded that trading schemes for greenhouse gas emissions would be the most effective way to achieve reduction targets. This was because all technologies were able to compete on the basis of their cost competitiveness after accounting for their relative effectiveness. In their calculations, competitiveness of individual electricity generation technologies can vary depending on present resource costs and future scarcity, future rates of technological change, required reliability standards and economies of scale. The results achieved through this study reflect the current situation in the UK, that in terms of energy generation, gas would provide the main fuel source, with biomass being the most prolific source of renewable energy. However, it might be expected that solar technologies may be used more extensively provided that expected future learning takes place, as was the premise proposed by Graham and Williams (2003).

An interesting example of developing energy policy can be found in the Baltic States in Northern Europe. Since the political changes in the 1990s, the Baltic States have undergone significant economic development and as a consequence are being forced to review their policies in respect of energy use. Miskinis et al (2006) identified that the drive for energy generated from renewable sources was as much driven by a need to improve energy self-sufficiency as a need to meet environmental targets required by the European Union under the EU Directive 2001/77/EC 2003. Relevant to this self-sufficiency is the overall increase in the price of oil; in 2004, the price of oil was $30 per barrel (Brynea et al. 2004), whereas in 2005, the price had increased to over $60 dollars a barrel and in 2008, peaked at $139 per barrel (Bloomberg 2008).

Some researchers suggest that solutions to regional and global environmental problems require deeper change than simply a few individuals adopting an artefact or service. A proposition put forward is that of transforming an entire technological regime (Berkhout et al. 2003). Boardman (2007) highlights the plan for a lower carbon strategy to firstly intensify energy conservation, then develop renewable energy sources and finally address issues of carbon sequestration and nuclear power. Taking this approach with technological regime change, the most desirable environmental solution would be chosen over all others and it would be pushed into use. There are issues associated with this approach; the method by which the solution is selected, and also the adoption of the method by the social network and individuals.

A second level of policy could be implemented by local authorities to influence adoption through routes such as education and information. Recommendations have previously been made by other researchers such as Aggarwal (1998), and Bolinger et al

(2001) that improved rates of adoption would be achieved through such routes. These recommendations fit with those of Geroski (2000) who suggested that the processes which influence consumer choice need to be the target of policy intervention.

The early adopters that were interviewed as part of the process to develop the heuristics shared a similar position in that they were all of retirement age, with money available to purchase technologies that would lower their future levels of financial risk; in other words, by installing solar power, they were able to reduce their energy bills in the future, when they may have less disposable income. These people were engaged in their 'energy' behaviour and were using innovative solutions to improve their situations; at the same time as being 'environmentally' minded, they could be 'financially astute'. This behaviour fits with Hansen (2005) who posited that early adopters might be described as being influenced by the 'emotional' perspective; they engage with the products and justify their beliefs by acting on them.

A possible policy position for local authorities therefore, would be to make available all information to its constituents that will enable them to make informed decisions about technologies that could improve their quality of life. As Local Authorities also have responsibilities for social housing, this could be used as a mechanism in some way to demonstrate solar technologies.

In addition to this, innovation theory has proposed that adopters will follow through an innovation decision process during which they will assess the relative advantage, compatibility, complexity, observability and trialability of innovations (Rogers 2003). However, policymakers should be aware that within the population, there will be subsets of adopters who will differ in their level of innovativeness, and will have differing attitudes to the technologies. Further to this, this research has shown that in regard to the innovation decision process, adopters at each level will react to the product attributes differently; in this research it was seen that a diminishing proportion of the ‘early majority’ would follow through the innovation decision process as presented by Rogers (2003). Hence, if local authorities could understand the dynamics of their constituencies, it might be possible to focus on the issues that are important to them, in order to improve adoption rates. Table 15 (page 85) demonstrates how the group of adopters could be filtered to best understand what emphasis the group places on each of the attribute levels.

Focusing on policies that could be implemented by commercial organisations, it is useful to review the theory of rational choice, whereby householders will choose technologies that offer the greatest reward, but with the lowest possible cost. ‘Cost’ in this situation might be considered in financial terms, but also the cost of investing time and resources to learning about the technologies, installing them in a property and adapting a lifestyle to make best possible use from them.

However, comparison of the rate of adoption between technologies shows that despite an increase in the rate of adoption for solar technologies, the rate at which insulation and high-efficiency boilers were adopted over a similar period was significantly faster. The benefits of the more affordable technologies such as high-efficiency boilers and insulation suggest that a significant improvement in solar technologies will be required before it is more widely adopted.

Hence, the solar technologies will need to undergo a process of continuous innovation, whereby performance improvements can be made to an existing innovation (Rogers 2003). In order to be successful, innovations should be simple, focused and specific and should start with a limited market, with a view to being a market leader; they can arise from an identification of the need for a new process, amendment of an existing process, or by following a shift in the industry or market structure (Drucker 1985).

5.2 Limitations and Weaknesses of the research

Every effort was made throughout this research programme to ensure that the study was carried out as robustly as possible; however, there were inevitable weaknesses and limitations. This section seeks to identify as many of the weaknesses and limitations in order that future research can take the issues into account. In particular, the limitations are caused by the:

- Methodology
- Focus of the study
- Funding source of the programme

The following sections discuss these weaknesses and limitations.

5.2.1 The Research Methodology

Issues of reliability and validity can occur within research programmes and must be identified as part of the results. The typical areas that these can occur are related to observer bias and error, participant bias and error, construct validity such as data collection and analysis, and also internal validity through testing, rivalry, and ambiguity about the causal effects (Robson 2002). This research programme used a number of research methods:

- Interview techniques and generation of constructs
- Survey techniques
- Statistical analysis

These methods gave rise to certain methodological concerns, which are discussed further in the sections below.

During the development of the survey form, interviewees were asked to develop a set of bipolar constructs using a triadic sorting and laddering technique. By doing this, the constructs would be generated using the terminology of the adopters as opposed to the technical terminology of those selling or developing the technology. The benefit would be that a better response rate would be facilitated from those unfamiliar with the technology.

A weaknesses of this approach was that constructs may not have been generated that related to every attribute category from the Diffusion of Innovation framework (Rogers 2003). For example, none were generated to describe trialability. Hence, it could be argued that either trialability is not important to the early adopters, or it is not an attribute suited to the innovation. The option for future research is to independently insert some descriptors relevant to trialability, or to survey respondents on how they value the option to trial the technology.

The survey methodology that was carried out followed a cross-sectional typology as opposed to a longitudinal typology. If the length of the project were expected to last a longer time period, it may have been possible to choose a longitudinal survey so that data could have been collected over time. The data sources presented information from marketing projects for a number of years since 2000. However, while all the projects had been running for a number of years, they were not run in parallel. Therefore, it would be impractical to test the data for the purposes of causality; in other words, why did householders choose one technology over another as this choice was not available to them.

The survey sampling groups were assumed to be early adopters and the early majority after Rogers (2003) classification. The assumption followed the reasoning that the innovators, who are the first group to adopt, will have been involved in the development of the technology and more likely to have installed the technologies on their own without a Council-led project to lead them. The early adopters are the second key group, who will have been the first to apply to the project for information and will be following the innovation decision process. The early majority were predicted to be the next group to adopt the technologies on the basis that they had been the first group to adopt insulation products, which are a proven technology, widely available and understood, and reduced in price. Therefore as the sample group of the early majority was assumed on the basis of previous adoption behaviour, and there is no guarantee that adoption behaviour between innovations is consistent, extreme caution should be given to any inference in respect of the broader population of adopters of energy efficiency technologies.

A key weakness in the application of the survey was that during the final week of the data collection, the Main Post Sorting Office in Northampton was subject to an arson attack. This may have had an influence on the total number of returns even though the number of returns provided sufficient data for analysis.

The early adopters survey form that was sent out contained 5 sections and was deemed to be very long by respondents. This led to a reduction in the size of the survey by harmonisation of some of the statements. However, an alternative approach may have been to send out multiple questionnaires either to the same respondent group over time, i.e. phase the application, or to send different surveys out to a set of respondents.

These options were not used because of the small number of available respondents in the early adopter group, and also survey fatigue of respondents asked to fill in multiple questionnaires over time.

Although comments were received on the structure of the survey form, none of the descriptors were challenged as being inappropriate, although some were repetitive. The decision making process statements however are open to criticism on two issues;

- There were insufficient questions / statements to allow cross examination, and to test for bias and error.
- The statements did not include any focus on the innovation decision sequence (knowledge, awareness, decision, implementation, confirmation)

Other research has used between 15 and 75 questions to test the innovation decision process, so this series of questions would never provide as detailed a response as those. This is potentially the greatest weakness within the thesis and limits the ability to draw conclusions on the process of rational choice. However, the focus of the research was primarily on the attitudes of adopters and due to lack of space in the questionnaire, and a limited number of adopters, it was decided not to develop more questions on this area.

A weakness with the collection of this type of data is the recall problem, and also pro-adoption bias. For example, if respondents are asked what their decision making process is in respect of solar power, they may suggest that they have rejected the innovation, but not even thought about it, simply answered the questions because they were asked to answer questions. If they had not adopted the innovation, they may not want to answer questions (as 1 non-respondent did specify in the questionnaire)

Limitations existed with the selection of data analysis. In relation to the adoption data of the technologies, only descriptive statistics, and an analysis of the variance (ANOVA) was carried out. Further testing could have been carried out to determine whether or not the rates of adoption show patterns that could be used to predict the ‘S’ curve of adoption, as suggested by Diffusion Theory. Further to this, the only data available for analysis was monthly adoption data for each technology; unfortunately there was no breakdown of the size of installation, type of individual technology, or baseline information concerning the property into which it was installed. This type of background information would have been more useful as it would have provided an insight into the perception of each householder to the attributes of the technologies; for example a householder with a property that is south-facing might have perceived greater benefit from a solar system than a householder in a property with an easterly perspective.

Given that a number of pairs of bipolar adjectives or phrases were developed during the interviews, a further technique can be used to look for relationships between bipolar adjectives or phrases. This technique is known as factor analysis and is known as a linear reduction technique (Dillon et. al 1994). However, examples of where factor analysis is carried out normally contain more than 100 bipolar adjectives or phrases so this level of analysis was considered unnecessary.

Although the repertory grid technique used provided good data and useful findings, further research could also have used a Conjoint Analysis to study the perspectives between differing solar products, or to investigate the impact of the differing perspective of the products between consumers and technical experts, who so often sell the products.

Statistical tests are developed to fit with certain criteria (e.g. number of groups and type of data), but Robson (2002) describes the controversy surrounding the use of statistical significance and how it can be misrepresented to infer findings on the broader population. To support this cautious approach, the null hypotheses followed the convention when using statistical tests of assuming a status quo, and if the results exceeded the test statistic, the suggested outcome was only that there was insufficient evidence to reject the null hypothesis.

5.2.2 The focus of the study

This study has focused on the adoption of domestic solar power systems, specifically domestic retrofitted systems. An issue that was immediately apparent from the literature was that the adoption of solar power systems was very limited; therefore any research into consumer attitudes would be fraught with difficulties because so few adopters would be available to gather from. Caird et al. (2008) found similar problems with collecting data about both types of solar system as this case study had found due to the limited number of individuals that had bought the systems, particularly photovoltaic systems

A criticism of the research could be that the focus on these technologies is not specific to either of the two solar technologies (i.e. solar thermal and photovoltaic). An assumption was made that respondents understood the technologies about which they were being asked as they were actors within the field of energy efficiency. This could have had an impact on the responses that were provided by the survey groups, as the economics for the technologies are very different. However, given that the level of adoption of either technology is so low, and that the general level of understanding between the two technologies is poor, it was decided to carry out the research using the term of solar technology. This could be addressed in future research once the level of understanding and levels of adoption increase, but for this research it was important that at least some responses were gained, and analysis of the situation could begin.

Given that the early adopter group had made enquiries to the solar promotional project, it was assumed that the knowledge levels of the group were high. This may have affected the answers the group gave. Hence, although their attitudes were positive towards the systems, this may have been based on vicarious information rather than direct experience with the systems over time. Further work could therefore be carried out with adopters over time to understand levels of discontinuation, or changing perspectives and attitudes.

The level of knowledge of the early majority group was assumed to be lower than the early adopter group. This becomes apparent when analysis of the responses to the bipolar adjectives or phrases shows a large proportion of answers that are centred on the mean point. This could be because respondents are keen to answer the survey, but do not know what the answer is, so they hedge their answers. This issue becomes a further concern when a researcher seeks to apply a description to this answer.

5.2.3 The impact of the Projects on the data collection and analysis

The research was funded by one of the promotional projects that was carried out by Daventry District Council (DDC). Although the Council had committed full support to the thesis and the project, there were some issues that limited the thesis. The duration of the project was limited to two years, therefore the pressure to deliver results to the scheme financiers was a key factor in the scope and execution of the survey. The ‘Boiler Magic’ and ‘ChillOUT’ schemes had previously collected information regarding house characteristics (e.g. orientation, date of construction, levels of insulation) but this was not made available to the research programme on the grounds of data protection.

DDC did restrict some of the information that the research programme could collect and the number of times information could be collected. This was done so that the residents of the district would not become frustrated with repeated information gathering exercises by the District Council. DDC were very conscious of issues that may cause a perceived drop in the level of service provided by the organisation; in part enhanced by the introduction at the time of new data protection and access to information legislation.

Finally, a further project which was designed to promote the adoption of all three technologies simultaneously (i.e. boilers, insulation and solar technologies) failed to operate according to the business plan. The business plan was not controlled as part of this thesis. The benefit of this project was that it would have provided data regarding the adoption and diffusion of the technologies. However, the result was a great deal of lost time and effort with no data to show.

6 Conclusions and Recommendations

This chapter summarises the extent to which the aim and objectives have been met. It also highlights the contribution of this thesis to substantive knowledge. In addition, some recommendations for further research are presented.

The aim of this thesis was to provide new insights into the adoption of solar power technologies. A literature review was carried out, from which research objectives were developed. The objectives were pursued through a case study research strategy that contained a number of key stages; the first to analysis the results of installation data for high-efficiency boilers, insulation and solar power systems. The second stage of the case study was to articulate a series of constructs that adopters of solar power systems used as heuristics in the adoption decision. The case study employed a survey methodology to research a wider group of current and assumed adopters, referred to as the early adopters and early majority. The basis of this categorisation was on the framework of adopter categories proposed by Rogers (2003) in the Diffusion of Innovations theory.

This section is split into two sections; the first section presents the conclusions against the research objectives. The second section summarises some recommendations that have been made for future research.

6.1 Conclusions against the research objectives

Five research objectives were set in support of the overall research aim to provide new insights into the adoption of solar power technologies. The following sections summarise the findings of the research against each of the objectives.

1. To identify theories of technology adoption which will enable the adoption of solar power technologies in the UK domestic sector to be assessed in a new light

The two forms of solar power technology have different characteristics, both in terms of the inherent technology and also their economics. Policy has identified that both forms of the technology provide potential for carbon reductions despite limitations that have been identified. The research problem was identified that attitudes of householders; in respect of either their attitudes to the technology or their decision processes when adopting the technology have not previously been investigated, and as a consequence, interventions cannot be effective until both the attitudes and the innovation decision making process are understood.

Theories of consumer behaviour, including rational choice could be used to further inform how consumers view the attributes of solar power systems and yet, these have not been used to inform the energy debate. Further criteria have been demonstrated to influence the decision making process, for example values and attitudes, learning and cognition, cognitive consistency and dissonance, as well as social norming influences on behaviour. The influence of each of these theories was used to determine the objectives for this research, each of which are summarised below.

2. To identify differences in the rate of adoption between energy efficiency and solar power technologies in the UK domestic sector

The results of the first stage of the case study articulated detailed adoption curves for the three technologies (high-efficiency boilers, insulation products, and solar power systems). Comparable research by the Buildings Research Establishment (BRE 2005) published current adoption curves for insulation and boilers, but this research identified for the first time the adoption curves for solar power systems. It should be noted that this rate of adoption is relative to a period of four years only, and is limited to the geographic area of Northamptonshire in the UK. This is one area of substantive knowledge that this thesis has contributed.

The adoption curves for Insulation and High-Efficiency boilers were similar to the results published by the BRE (2005), thus providing a degree of validity. However, future work could be carried out, which is detailed in the recommendations for future research in section 6.2, below. On solar power systems in particular, the rate of adoption increased significantly over the four years of the 'SolarPlan' project, with an almost equal number of installations occurring in the final six months of the project to the first 2.5 years. The adoption curve follows a pattern similar to Rogers (2003) 'S' curve of adoption although the curve has not appeared to level at the top end, indicating that the market for the systems is still growing, therefore future monitoring will be needed to identify the size of the market for the area studied in the case study; this could be useful in determining the national (UK) market for solar power systems.

3. To identify the heuristics that consumers use in their adoption decisions regarding solar power technologies

The second stage of the case study sought to articulate a series of constructs that adopters use as heuristics in the adoption decision process for solar power systems. This part of the research differed from other comparable research (e.g. Book 1999, Caird et al. 2008) in that it identified in a way that had not been before, the actual viewpoints and descriptors of adopters of solar power systems as opposed to those involved with the commercial and technical development of the technology. This repertoire of construct is the second area in which this thesis has contributed to the substantive knowledge.

The constructs were used to research attitudes to solar power systems of both early adopters and an assumed group of pragmatic adopters, referred to as the early majority. The results of this research highlighted that adopters are mostly positive to solar power systems, and most of all to the environmental aspects of the technology. However, on aesthetic, operational and financial issues, the responses indicated less positive attitudes by the 'pragmatic' majority.

4. To explore whether or not a chasm exists between earlier and later adopters of domestic solar power technologies

Moore (1999) identified the presence of a chasm for hi-tech (information technology) products. This research sought to discover whether or not a chasm existed in relation to solar power technologies. As a result of the survey, it is proposed that a chasm does indeed exist; the early majority were significantly different to the early adopters in relation to seven of the constructs. In addition, the chasm could be determined from the responses to decision priority statements. Rogers (2003) makes generalisations that adopter categories each follow the same decision process in relation to innovation attributes, with the key difference being the time at which the adoption decision was made. However, this research found that this was not entirely correct and differences were found on the priority that adopters placed on different innovation attributes. Specifically, 7% of adopters did not place the priority of their decision making on attributes related to relative advantage. As a result of this finding, further research is recommended as detailed in section 6.2 below (Recommendation no 5). This area is one of the areas in which this thesis has contributed to theory; the presence of the chasm can be applied to a wider range of innovations than just hi-tech products and services.

5. To identify policy relevant insights into the adoption of solar power technologies in the UK domestic sector

Three levels of policy intervention have been discussed; strategic governmental policy using legislation to influence adoption, policies implemented by local authorities to influence adoption through routes such as education and information, and policies implemented by the commercial sector seeking to sell solar systems.

The UK government has set policy to increase the level of energy generation sourced from renewable technologies and solar power technologies at a domestic level are considered part of that technological mix. However, the policy has focused on the development of the technology and has largely ignored the broader range of consumer theory that is applicable to this issue.

Local authorities that are charged with improving levels of energy efficiency and reducing levels of carbon emissions in their constituencies are minded to consider their role in educating and informing the population in relation to solar technologies. Using information available to them about the populous might inform the authority about strategies to promote the use of solar systems; whether it is informing about the benefits that solar could bring to mitigating future energy costs, about how solar systems could improve quality of life, or about how solar technologies could be used to improve the value of property.

Of particular note to commercial organisations is that the chasm identified through this research consisted of both attitudinal and technological issues (e.g. aesthetic, maintenance and installation issues) identified through the survey of the heuristics. For example, Hansen (2005) categorised four perspectives of adopters, and the early adopters appear to have engaged with the technologies and undertaken both the information processing and value perspectives, in that they have learnt about the technologies and carried out an assessment of the utility the technologies offer. Having carried out these assessments, they have justified their emotional beliefs and installed the systems. On the other hand, the later majority have not installed the systems having carried out an assessment of the price (a ‘cue’) and have not been motivated to install the systems.

The following section outlines the recommendations for further research. These recommendations are made in light of the shortcomings and opportunities that presented themselves in the course of this research programme.

6.2 Recommendations for further research

This research sought to explore some of the key factors which influence the rate of adoption of solar power technologies by individuals in the UK domestic sector. Although this research has concluded successfully, the results suggest further avenues of research that will help to develop knowledge and theory in this field of research.

1) Whilst the projects studied in this thesis have concluded, the market will continue to grow and further installations of energy efficiency technologies and solar power systems will continue. A natural continuation of this research will be to continue tracking the number of sales of solar power to develop the diffusion ‘S’ curve. In addition, specific analysis could be undertaken of the installation data in this thesis in order to quantitatively compare the adoption rates for the three technologies to data generated by BRE (2005). Further monitoring could also verify the validity of whether this follows a probit model, or epidemic model of growth, as proposed by Geroski (2000).
2) Where this research focussed on issues associated to attitudes of a ‘pragmatic majority’ towards solar power systems, further research could investigate why the early adopters installed when they did, and specifically what their motivations for installation were. Over time, as those households that have installed systems develop their experience with solar power systems, further investigation could be carried out as to whether their attitudes to the systems remained as they were when they first installed the systems. Further research could then be carried out on the rebound effect, which would also further the work of Caird et al. (2008).

3) A further extension of this research could be to further test the chasm as identified through this research in order to test its validity. For example, research could be carried out on the early majority group using examples of systems that had been altered to address the issues that the group considered were less than favourable. If the results of that research showed that the early majority were more positive to adopting the systems, this would confirm the presence and composition of the chasm

4) Further research could be carried out in relation to the adoption rates of other energy efficiency and micro-generation technologies; such as loft and cavity wall insulation, wind or wood burning stoves. This could be carried out in order to confirm the rates of adoption that this research has illustrated, or to confirm the extrapolation of adoption rates for solar power systems that other research did not cover (e.g. BRE 2005).
5) The literature review made reference to the use of demographics to differentiate between adopter categories. Whereas this research was limited to the attitudes that respondents have to constructs of solar power systems, further investigation could be made into values of householders, in order to ascertain whether certain values are indicators of adoption categorisation.

The aim of this thesis was to provide new insights into the adoption of solar power technologies. The five areas identified above would serve well to continue or to complement this thesis.

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7 Appendix A. Statistical Tests on Project Installation data

This appendix contains the tables containing monthly installation figures and the calculations for statistical testing on the installation data. The results of this analysis are discussed further in the Case Study.

7.1 Installation Figures from the DDC Projects

The following three tables contain installation data for boilers, insulation and solar power technologies.

Table 19. Monthly Installations of High Efficiency Boilers 2001-2005

Cumulative annual figures are shown in brackets										
	2001		2002		2003		2004		2005	
January	0	(0)	18	(18)	40	(40)	37	(37)	23	(23)
February	37	(37)	35	(53)	39	(79)	0	(37)	20	(43)
March	31	(68)	46	(99)	39	(118)	43	(80)	15	(58)
April	36	(104)	30	(129)	43	(161)	35	(115)	62	(120)
May	31	(135)	50	(179)	26	(187)	28	(143)	24	(144)
June	31	(166)	22	(201)	26	(213)	20	(163)	30	(174)
July	33	(199)	37	(238)	33	(246)	14	(177)		
August	0	(199)	37	(275)	33	(279)	23	(200)		
September	138	(337)	57	(332)	33	(312)	32	(232)		
October	37	(374)	104	(436)	33	(345)	18	(250)		
November	73	(447)	40	(476)	31	(376)	28	(278)		
December	18	(465)	40	(516)	37	(413)	35	(313)		
Total	**464**	**(465)**	**516**	**(981)**	**413**	**(1394)**	**313**	**(1707)**	**174**	**(1881)**

Note: The annual data did have some notable issues. For months were 0 installations are record, official records shows that for management reasons no data was recorded.

Table 20. Monthly Sales of Insulation Measures 2002-2005

(cumulative annual sales in brackets)								
	2002		2003		2004		2005	
January			423	(423)	178	(178)	457	(457)
February			503	(926)	221	(399)	830	(1287)
March			398	(1324)	398	(797)	925	(2212)
April			248	(1572)	329	(1126)	803	(3015)
May			180	(1752)	290	(1416)	748	(3763)
June			206	(1958)	200	(1616)	765	(4528)
July			280	(2238)	165	(1781)		
August	0	(0)	234	(2472)	277	(2058)		
September	53	(53)	338	(2810)	403	(2461)		
October	290	(343)	587	(3397)	696	(3157)		
November	386	(729)	480	(3877)	797	(3954)		
December	394	(1123)	374	(4251)	766	(4720)		
Total	**1123**	**(1123)**	**4251**	**(5374)**	**4720**	**(9594)**	**4258**	**(**

Table 21. Monthly Sales of Solar Thermal and PV Sales 2002-2005

(cumulative annual sales in brackets)								
	2002		2003		2004		2005	
January	1	(1)	0	(0)	0	(0)	7	(7)
February	0	(1)	0	(0)	6	(6)	14	(21)
March	0	(1)	0	(0)	3	(9)	9	(30)
April	0	(1)	2	(2)	0	(9)	20	(50)
May	0	(1)	4	(6)	5	(14)	23	(73)
June	1	(2)	5	(11)	6	(20)	12	(85)
July	1	(3)	0	(11)	9	(29)		
August	0	(3)	9	(20)	13	(42)		
September	2	(5)	3	(23)	15	(57)		
October	0	(5)	4	(27)	22	(79)		
November	1	(6)	1	(28)	8	(87)		
December	0	(6)	2	(30)	2	(89)		
Total	6	(6)	30	(36)	89	(125)	85	(210)

The statistical tests used were an Analysis of Variation (ANOVA), which compares the variation between means for groups being tested. Each summary table contains a list of the groups being tested. Figures 32 to 34 inclusive compare the annual groups, whereas the summary in Figure 35 compares each technology.

The result of the ANOVA test is a criterion figure (F Crit), which is compared to the Test Statistic. The test statistic is generated from a table of statistics derived from the normal distribution (See Dillon et al. 1994). A statistically significant difference is indicated when the F Criterion is greater than the Test Statistic (Dillon et al. 1994)

7.2 Correlation between adoption curves

	High Efficiency Boilers	*Solar Systems*
High Efficiency Boilers	1	
Solar Systems	0.864136536	1

	Solar Systems	*Insulation*
Solar Systems	1	
Insulation	0.948653764	1

	High Efficiency Boilers	*Insulation*
High Efficiency Boilers	1	
Insulation	0.973619426	1

Anova: Single Factor Boilers

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
2001	12	465	38.75	1334.931818
2002	12	516	43	487.6363636
2003	12	413	34.41666667	28.62878788
2004	12	313	26.08333333	140.4469697
2005	6	174	29	285.6

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2109.416667	4	527.3541667	1.107313245	0.363753307	**2.561122869**
Within Groups	23336.08333	49	476.2465986			
Total	25445.5	53				
Test Statistic α = 0.05	**2.57**					

Figure 11. ANOVA results testing the variances of the years of Boiler Sales

Anova: Single Factor Insulation

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
2002	5	1123	224.6	34728.8
2003	12	4251	354.25	16637.29545
2004	12	4720	393.3333333	53407.33333
2005	6	4528	754.6666667	25156.26667

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	923152.7214	3	307717.5738	9.214992693	0.0001649	**2.911335173**
Within Groups	1035187.45	31	33393.14355			
Total	1958340.171	34				
Test Statistic α = 0.05	**2.93**					

Figure 12. ANOVA results testing the variances of the years of Insulation sales

Anova: Single Factor	Solar					
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
2002	12	6	0.5	0.454545455		
2003	12	30	2.5	7.363636364		
2004	12	89	7.416666667	42.99242424		
2005	6	85	14.16666667	38.96666667		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	892.25	3	297.4166667	14.99414041	1.35314E-06	**2.851741954**
Within Groups	753.75	38	19.83552632			
Total	1646	41				
Test Statistic α = 0.05	**2.85**					

Figure 13. ANOVA results testing the variances of the years of Solar system sales

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Boilers	5	6428	1285.6	327498.8		
Insulation	4	31213	7803.25	34089960.92		
Solar	4	377	94.25	8508.25		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	140680032.5	2	70340016.27	6.789222804	0.013722213	4.102815865
Within Groups	103605402.7	10	10360540.27			
Total	244285435.2	12				
Test Statistic α = 0.05 = 4.10						

Figure 14. ANOVA test for variance between measures

8 Appendix B. Triadic Sorting Interview sheets

Interview sheets for Bi-polar adjectives to be used in Semantic Differential questionnaire.

Cranfield UNIVERSITY
Silsoe

Institute of Water and Environment

Adam Faiers

MSc by Research

Consumer attitudes regarding Solar Thermal and Photovoltaic systems.

Office Use only

Date of Interview	
Time of Interview	
Comments	

1. Firstly, think of as many features of your solar system as you can and put them in the box provided.

1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

2. Take three features and group them together.

Group no	Feature numbers
1	
2	
3	
4	
5	
6	
7	
8	
9	

3. Take two of the features and describe (in one word if possible) how they are similar, but differ from the third.

In what way similar	In what way different	In what way similar	In what way different

Thank you for your assistance.

9 Appendix C. Draft Questionnaire

Dear Householder,

Daventry District Council is currently working with all the other Local Authorities in Northamptonshire to improve energy efficiency in private houses.

As part of this work, the Council has gained funding from the Department of Trade and Industry to develop local awareness in Solar power. We have agreed to work with a research project at Cranfield University to investigate some of the issues regarding the use of solar power.

As a previous enquirer to the Solarplan project, we are seeking your help with the research. Enclosed with this letter is a simple questionnaire, which we would ask you to fill in and return in the pre-paid envelope.

The questionnaire is entirely voluntary although each respondent will be put into a draw for a £25 cash prize. Please return your questionnaires to us by Friday 12th September to be entered into the draw.

Thank you for your assistance,

Yours sincerely,

David Malone
Home Energy Conservation Officer

Part 1. Please tell us about yourself.

Are you:

Male ☐
Female ☐

Which category best describes your age?

18 – 35 ☐
36 – 50 ☐
51 – 65 ☐
65+ ☐

Are you living alone or with a partner / spouse?

Alone ☐
Partner / Spouse ☐

Please describe your occupation

Student ☐
Professional (e.g. Lawyer / Doctor) ☐
Tradesmen (e.g. plumber , builder) ☐
Retired ☐
Other (please indicate) [ ]

Please indicate how many people live at home?

0 ☐
1-3 ☐
3-5 ☐
More than 5 ☐

Please tick the category which best describes your total household income

0 – 14,999 ☐
15,000 – 29,999 ☐
30,000 – 44,999 ☐
45,000 – 59,999 ☐
60,000+ ☐

Do you live in an urban area, or village / rural area

Village / rural ☐
Town ☐

Please indicate your energy supply (tick more than one if necessary)

Mains electricity ☐
Mains Gas ☐
LPG ☐
Oil ☐
Solid Fuel ☐
Other (please indicate) [ ]

Please describe your house

House ☐
Bungalow ☐
Flat ☐
Maisonette ☐

Is your house:

Detached ☐
Semi-detached ☐

Does your house have:

Loft insulation ☐
Cavity Wall insulation ☐
A boiler installed after 1996 ☐
Heating controls ☐
Thermostatic radiator valves ☐
Radiator panels ☐
Draughtproofing ☐
Double Glazing ☐

Part 2. Using solar power in your home.

Below are a series of statements, which show different opinions about solar. Please put a cross on the line between the words or phrases to show how strong your opinion is to either one statement or the other.

The closer to the statement you cross the line, the stronger you support the statement. A line halfway between shows that you don't favour either statement.

Solar has a long payback	-----+-----+-----+-----+-----+-----+-----	Solar has a short payback
There is a low level of grant available	-----+-----+-----+-----+-----+-----+-----	There is a high level of grant
Solar systems are an appreciating asset	-----+-----+-----+-----+-----+-----+-----	Solar is a depreciating asset
The systems are intrusive	-----+-----+-----+-----+-----+-----+-----	The systems are hidden away
Attractive	-----+-----+-----+-----+-----+-----+-----	Unattractive
Solar systems needs more maintenance than existing heating systems	-----+-----+-----+-----+-----+-----+-----	Solar systems needs less maintenance than existing heating systems
Reduces emissions	-----+-----+-----+-----+-----+-----+-----	Increases emissions
Increases pollution	-----+-----+-----+-----+-----+-----+-----	Reduces pollution
Dirty	-----+-----+-----+-----+-----+-----+-----	Clean
Generates savings	-----+-----+-----+-----+-----+-----+-----	Costs the same
Acts all of the time	-----+-----+-----+-----+-----+-----+-----	Seasonal
Natural	-----+-----+-----+-----+-----+-----+-----	Man-made
Solar systems provide a comprehensive solution for hot water and electricity	-----+-----+-----+-----+-----+-----+-----	Normal heating and mains power provides an adequate solution
Small savings	-----+-----+-----+-----+-----+-----+-----	Wasteful
Waste of money	-----+-----+-----+-----+-----+-----+-----	Home Improvement

Please go to Part 3.

Part 3. Do you agree or disagree with these statements about using solar energy Please tick the box which you feel reflects your opinion	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Using solar power is convenient	☐	☐	☐	☐	☐
Solar power is not an affordable technology	☐	☐	☐	☐	☐
Solar power is not compatible with personal priorities	☐	☐	☐	☐	☐
Solar offers the opportunity for the individual to make a statement	☐	☐	☐	☐	☐
Solar systems promote energy efficiency in the home	☐	☐	☐	☐	☐
Systems have long ‘simple’ payback periods	☐	☐	☐	☐	☐
Solar power will not benefit from future changes in policy and green energy competition	☐	☐	☐	☐	☐
Helps with the overall green situation	☐	☐	☐	☐	☐
Makes best use of what is available	☐	☐	☐	☐	☐
Solar systems do not provide savings on running costs	☐	☐	☐	☐	☐
Contribution to conservation	☐	☐	☐	☐	☐
Gives a positive feeling	☐	☐	☐	☐	☐
Could develop in the future	☐	☐	☐	☐	☐
Solar systems do not add value to a property	☐	☐	☐	☐	☐
A solar systems will not help sell a house any faster than on a house without one	☐	☐	☐	☐	☐
Solar provides protection against future energy price rises (in real terms and inflationary)	☐	☐	☐	☐	☐
The installation can be disruptive	☐	☐	☐	☐	☐
Solar power is a safe form of power generation	☐	☐	☐	☐	☐
Solar is not very simple to install in a private household	☐	☐	☐	☐	☐
Guarantees provide confidence in the long-term performance	☐	☐	☐	☐	☐
The positioning of solar does affect the visual landscape	☐	☐	☐	☐	☐
The dispersed nature of solar installations means that solar power isn’t highly visible form of renewable energy	☐	☐	☐	☐	☐

Please go to Part 4.

Part 4. Are these statements true or false	True	False
I would consider the advantages and benefits of Solar energy to be the most important factor in the decision to buy one	☐	☐
If a system didn't fit in with my lifestyle, I would buy one regardless of the benefits	☐	☐
I think that how the system fits into my house would be critical in the purchase	☐	☐
If I thought solar had good benefits	☐	☐
If I thought the systems were too complex, it might turn me off buying one	☐	☐
I would buy a solar system because I enjoy the technological aspects	☐	☐
If I didn't understand how it worked, I wouldn't buy one regardless of the benefits	☐	☐
Seeing a system working is more important	☐	☐
I would consider buying a system if I saw more of them around	☐	☐
I would consider buying a solar system if I could either try one first or see one working close up.	☐	☐

Part 5. How necessary are the different features of solar power systems to you if you were to consider buying a system. In this section, we would ask you to tick the box according to how necessary or unnecessary you view the feature.	Very Necessary	Necessary	Neither necessary or unnecessary	Unnecessary	Very unnecessary
Energy using a 'clean' technology with no carbon or other atmospheric emissions	☐	☐	☐	☐	☐
Saving natural resources	☐	☐	☐	☐	☐
Providing fuel – cost savings	☐	☐	☐	☐	☐
Largely maintenance free	☐	☐	☐	☐	☐
A greater water flow-rate when connected to a combination boiler (Solar Thermal)	☐	☐	☐	☐	☐
Irregular source of power	☐	☐	☐	☐	☐
Compatibility with other heating or electricity systems	☐	☐	☐	☐	☐
10 year + guarantee	☐	☐	☐	☐	☐
Usable all year round	☐	☐	☐	☐	☐
Toughened, hard to break materials	☐	☐	☐	☐	☐
Proven and mature technology	☐	☐	☐	☐	☐
Recognised standards	☐	☐	☐	☐	☐
No need to make any changes to normal wiring systems or consumption patterns (Solar Electric)	☐	☐	☐	☐	☐
Unavailability for trial basis	☐	☐	☐	☐	☐

Thank you for your assistance. Please write your Name and Telephone Number below to be entered into the £25 cash prize draw.

Name	Telephone Number

10 Appendix D. Early Adopters Questionnaire

Part 1. Please tell us about yourself.

Which category best describes your age?

18 – 35	☐	51 – 65	☐
36 – 50	☐	66+	☐

Please describe your occupation ?

Please indicate how many people live at your home?

1-2	☐	6+	☐
3-5	☐		

Please tick the category which best describes your total household income

0 – 14,999	☐	30,000 – 44,999	☐
15,000 – 29,999	☐	45,000 – 59,999	☐
		60,000 +	

Do you live in an urban area, or village / rural area

Urban	☐	Rural	☐

What type of property do you live in? (tick as applicable)

Detached	☐	Flat	☐
Semi-detached	☐	Maisonette	☐
Terrace	☐		☐

How many floors does your home have ?

1	☐	4	☐
2	☐	5+	☐
3	☐		

What is your main heating fuel?

Electricity	☐	Bottled Gas	☐
Oil	☐	Solid Fuel	☐
Mains Gas	☐	LPG	☐

Has your property had the following energy saving measures installed?

Cavity Wall insulation	☐	Thermostatic Radiator Valves	☐
Loft insulation	☐	Heating controls	☐
Draughtproofing	☐	Double Glazing	☐
Energy efficient boiler	☐	Radiator panels	☐
Low energy lightbulbs	☐	Immersion tank insulation	☐

Part 2. Are these statements true or false

	True	False
I would consider the advantages and benefits of a product to be the most important factor in the decision to buy one	☐	☐
I would only purchase a product if it worked with what I already owned	☐	☐
If I thought a product was too complex, it might discourage me from buying one regardless of the benefits it has.	☐	☐
I would be less likely to buy a product if I hadn't seen it in popular use	☐	☐
I would be more likely to buy a product if I could either try it first or see it working close up.	☐	☐
Knowing a product fits with my lifestyle is more important than trying it first	☐	☐

Part 3. Using solar power in your home.

Below are a number of statements that could describe solar energy use in the home. For each pair of words or phrases, please place a mark on the line to best describe your feelings.

Solar has a long payback	-----+-----+-----+-----+-----+-----+-----	Solar has a short payback
There is a low level of grant available	-----+-----+-----+-----+-----+-----+-----	There is a high level of grant
Solar systems are an appreciating asset	-----+-----+-----+-----+-----+-----+-----	Solar is a depreciating asset
The systems are intrusive	-----+-----+-----+-----+-----+-----+-----	The systems are hidden away
Attractive	-----+-----+-----+-----+-----+-----+-----	Unattractive
Solar systems needs more maintenance than existing heating systems	-----+-----+-----+-----+-----+-----+-----	Solar systems needs less maintenance than existing heating systems
Reduces carbon emissions	-----+-----+-----+-----+-----+-----+-----	Increases carbon emissions
Increases pollution	-----+-----+-----+-----+-----+-----+-----	Reduces pollution
Dirty	-----+-----+-----+-----+-----+-----+-----	Clean
Generates savings	-----+-----+-----+-----+-----+-----+-----	Does not generate savings
Acts all of the time	-----+-----+-----+-----+-----+-----+-----	Seasonal
Natural	-----+-----+-----+-----+-----+-----+-----	Man-made
Solar systems provide a comprehensive solution for hot water and electricity	-----+-----+-----+-----+-----+-----+-----	Normal heating and mains power provides an adequate solution
Waste of money	-----+-----+-----+-----+-----+-----+-----	Home Improvement
affordable technology	-----+-----+-----+-----+-----+-----+-----	unaffordable technology
Could develop in the future	-----+-----+-----+-----+-----+-----+-----	Probably won’t develop in the future
Does not help sell a house any faster	-----+-----+-----+-----+-----+-----+-----	Might help sell a house any faster
Does not add value to a property	-----+-----+-----+-----+-----+-----+-----	Adds value to a property
Provides a visual statement of beliefs	-----+-----+-----+-----+-----+-----+-----	Not a highly visible technology
Will be more widespread in the future	-----+-----+-----+-----+-----+-----+-----	Unlikely to become more popular
Solar power is compatible with modern living	-----+-----+-----+-----+-----+-----+-----	Solar power is not compatible with modern living
Difficult to install in a property	-----+-----+-----+-----+-----+-----+-----	Simple to install in a property
safe form of power generation	-----+-----+-----+-----+-----+-----+-----	Not a safe form of power generation
The positioning of solar panels does not affect the visual landscape	-----+-----+-----+-----+-----+-----+-----	The positioning of solar panels does affect the visual landscape

Part 4. Please tick the appropriate box according to how necessary or unnecessary you consider the following features of solar power	**Very Necessary**	**Necessary**	**Neither necessary or unnecessary**	**Unnecessary**	**Very unnecessary**
Energy using a ‘clean’ technology with no carbon or other atmospheric emissions	☐	☐	☐	☐	☐
Saving natural resources	☐	☐	☐	☐	☐
Providing fuel – cost savings	☐	☐	☐	☐	☐
Largely maintenance free	☐	☐	☐	☐	☐
A greater water flow-rate when connected to a combination boiler (Solar Thermal)	☐	☐	☐	☐	☐
Irregular source of power	☐	☐	☐	☐	☐
Compatibility with other heating or electricity systems	☐	☐	☐	☐	☐
10 year + guarantee	☐	☐	☐	☐	☐
Usable all year round	☐	☐	☐	☐	☐
Toughened, hard to break materials	☐	☐	☐	☐	☐
Proven and mature technology	☐	☐	☐	☐	☐
Recognised standards of manufacture	☐	☐	☐	☐	☐
Guarantees of performance	☐	☐	☐	☐	☐
Endorsement by a local authority or Council	☐	☐	☐	☐	☐
No need to make any changes to normal wiring systems or consumption patterns (Solar Electric)	☐	☐	☐	☐	☐
Unavailability for trial basis	☐	☐	☐	☐	☐

Thank you for your assistance. Please write your Name and Telephone Number below to be entered into the £25 cash prize draw.

Name Telephone Number

Mr/Mrs/Ms/Dr ________________________

11 Appendix E. Final Questionnaire

Part 1. Using solar power in your home.

Below are a number of statements that could describe solar energy use in the home. For each pair of words or phrases, please place a mark on the line to best describe your feelings.

Solar has a long payback	-----+-----+-----+-----+-----+-----+-----	Solar has a short payback
There is a low level of grant available	-----+-----+-----+-----+-----+-----+-----	There is a high level of grant
Solar systems are an appreciating asset	-----+-----+-----+-----+-----+-----+-----	Solar is a depreciating asset
The systems are intrusive	-----+-----+-----+-----+-----+-----+-----	The systems are hidden away
Attractive	-----+-----+-----+-----+-----+-----+-----	Unattractive
Maintenance free	-----+-----+-----+-----+-----+-----+-----	Needs regular maintenance
Reduces carbon emissions	-----+-----+-----+-----+-----+-----+-----	Increases carbon emissions
Increases pollution	-----+-----+-----+-----+-----+-----+-----	Reduces pollution
Dirty	-----+-----+-----+-----+-----+-----+-----	Clean
Generates savings	-----+-----+-----+-----+-----+-----+-----	Does not generate savings
Acts all of the time	-----+-----+-----+-----+-----+-----+-----	Seasonal
Natural	-----+-----+-----+-----+-----+-----+-----	Man-made
Solar systems provide a comprehensive solution for hot water and electricity	-----+-----+-----+-----+-----+-----+-----	Normal heating and mains power provides an adequate solution
Waste of money	-----+-----+-----+-----+-----+-----+-----	Home Improvement
affordable technology	-----+-----+-----+-----+-----+-----+-----	unaffordable technology
Could develop in the future	-----+-----+-----+-----+-----+-----+-----	Probably won't develop in the future
Does not help sell a house any faster	-----+-----+-----+-----+-----+-----+-----	Might help sell a house any faster
Does not add value to a property	-----+-----+-----+-----+-----+-----+-----	Adds value to a property
Provides a visual statement of beliefs	-----+-----+-----+-----+-----+-----+-----	Not a highly visible technology
Will be more widespread in the future	-----+-----+-----+-----+-----+-----+-----	Unlikely to become more popular
Solar power is compatible with modern living	-----+-----+-----+-----+-----+-----+-----	Solar power is not compatible with modern living
Difficult to install in a property	-----+-----+-----+-----+-----+-----+-----	Simple to install in a property
safe form of power generation	-----+-----+-----+-----+-----+-----+-----	Not a safe form of power generation
The positioning of solar panels does not affect the visual landscape	-----+-----+-----+-----+-----+-----+-----	The positioning of solar panels does affect the visual landscape
Saves fuel	-----+-----+-----+-----+-----+-----+-----	Does not save fuel
Toughened, hard to break materials	-----+-----+-----+-----+-----+-----+-----	Fragile and exposed
A greater water flow-rate when connected to a combination boiler (Solar Thermal)	-----+-----+-----+-----+-----+-----+-----	No additional benefits
Proven and mature technology	-----+-----+-----+-----+-----+-----+-----	New, unproved technology

Part 2. Please tell us about yourself.

Which category best describes your age?

18 – 35	☐	51 – 65	☐
36 – 50	☐	66+	☐

Please describe your occupation ?

Please indicate how many people live at your home?

1-2	☐	6+	☐
3-5	☐		

Please tick the category which best describes your total household income

0 – 14,999	☐	30,000 – 44,999	☐
15,000 – 29,999	☐	45,000+	☐

What is your main heating fuel?

Electricity	☐	Bottled Gas	☐
Oil	☐	Solid Fuel	☐
Mains Gas	☐	LPG	☐

Has your property had the following energy saving measures installed?

Cavity Wall insulation	☐	Thermostatic Radiator Valves	☐
Loft insulation	☐	Heating controls	☐
Draughtproofing	☐	Double Glazing	☐
Energy efficient boiler	☐	Radiator panels	☐
Low energy lightbulbs	☐	Immersion tank insulation	☐

Do you live in an urban area, or village / rural area

Urban	☐	Rural	☐

Part 3. Are these statements true or false

	True	False
I would consider the advantages and benefits of a product to be the most important factor in the decision to buy one	☐	☐
I would only purchase a product if it worked with what I already owned	☐	☐
If I thought a product was too complex, it might discourage me from buying one regardless of the benefits it has.	☐	☐
I would be less likely to buy a product if I hadn't seen it in popular use	☐	☐
I would be more likely to buy a product if I could either try it first or see it working close up.	☐	☐
Knowing a product fits with my lifestyle is more important than trying it first	☐	☐

Thank you for your assistance. Please write your Name and Telephone Number below to be entered into the £50 cash prize draw.

Name　　　　　　　　　　Telephone Number

Mr/Mrs/Ms/Dr ________________________

12 Appendix F. Early Adopters Survey Data results

This Appendix contains the detailed response data and results of statistical testing carried out on the responses from the 'Early Adopter' survey.

The appendix contains:

- Descriptive Statistics, including simple classification and cross-tabulation
- Comparison of Means, including comparisons within socio-economic groups of the responses to constructs
- Graphs illustrating responses to constructs per attribute category
- Comparisons of Means for responses to the 'adoption statements'

For reference purposes, Figure 37 contains a numbered index list of the 'positive' constructs. This is for use when referring to the graphs used in this appendix.

12.1 Descriptive Statistics

12.1.1 Socio-economic classification

Table 22. Frequency Table (Gender)

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	27	62.8	71.1	71.1
	Female	11	25.6	28.9	100.0
	Total	38	88.4	100.0	
Missing	Missing	5	11.6		
Total		43	100.0		

Table 23. Frequency Table (Age)

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-35	4	9.3	9.3	9.3
	36-50	19	44.2	44.2	53.5
	51-65	13	30.2	30.2	83.7
	66+	7	16.3	16.3	100.0
	Total	43	100.0	100.0	

Table 24. Frequency Table (Occupation)

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Retired	15	34.9	35.7	35.7
	Senior management	3	7.0	7.1	42.9
	Professional	5	11.6	11.9	54.8
	Semi-skilled	15	34.9	35.7	90.5
	Not working	4	9.3	9.5	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

Table 25. Frequency Table (Number of people at home)

Number of People at Home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2	25	58.1	58.1	58.1
	3-5	17	39.5	39.5	97.7
	6+	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

Table 26. Frequency Table (Total Household Income)

Total Household income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-14,999	10	23.3	27.0	27.0
	15-29,999	14	32.6	37.8	64.9
	30-49,999	7	16.3	18.9	83.8
	50,000+	6	14.0	16.2	100.0
	Total	37	86.0	100.0	
Missing	Missing	6	14.0		
Total		43	100.0		

Table 27. Frequency Table (House Location)

House location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	20	46.5	46.5	46.5
	Rural	23	53.5	53.5	100.0
	Total	43	100.0	100.0	

Table 28. Frequency Table (Primary Heating Fuel type)

Primary fuel type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Electricity	5	11.6	12.2	12.2
	Oil	10	23.3	24.4	36.6
	Mains Gas	21	48.8	51.2	87.8
	Solid Fuel	2	4.7	4.9	92.7
	LPG	3	7.0	7.3	100.0
	Total	41	95.3	100.0	
Missing	Missing	2	4.7		
Total		43	100.0		

12.1.2 Energy Efficiency measures installed

Table 29. Energy Efficiency measure installed (Solar Thermal)

Solar Hot Water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	9.3	9.5	9.5
	No	38	88.4	90.5	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

Table 30. Energy Efficiency measure installed (Photovoltaics)

Photovoltaic

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	2	4.7	4.8	4.8
	No	40	93.0	95.2	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

Table 31. Energy Efficiency measure installed (Cavity Wall Insulation)

cavity wall insulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	58.1	59.5	59.5
	No	17	39.5	40.5	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

Table 32. Energy Efficiency measure installed (Loft Insulation)

loft insulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	37	86.0	88.1	88.1
	No	5	11.6	11.9	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

Table **33. Energy Efficiency measure installed (Energy efficient boiler)**

energy efficient boiler

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	16	37.2	38.1	38.1
	No	26	60.5	61.9	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

Table 34. Energy Efficiency measure installed (Double Glazing)

Double Glazing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	33	76.7	78.6	78.6
	No	9	20.9	21.4	100.0
	Total	42	97.7	100.0	
Missing	Missing	1	2.3		
Total		43	100.0		

12.1.3 Cross-tabulations of the socio-economic profiles

Table 35. Cross tabulation (Age vs occupation)

Age * Occupation Crosstabulation

Count

		Occupation					Total
		Retired	Senior management	Professional	Semi-skilled	Not working	
Age	18-35		1	1	1	1	4
	36-50	2	2	4	9	1	18
	51-65	6			5	2	13
	66+	7					7
Total		15	3	5	15	4	42

Table 36. Cross tabulation (Age vs. Gender)

Age * Gender Crosstabulation

Count

		Gender		Total
		Male	Female	
Age	18-35	2	2	4
	36-50	12	3	15
	51-65	7	5	12
	66+	6	1	7
Total		27	11	38

Table 37. Cross-tabulation (Age vs. total household income)

Age * Total Household income Crosstabulation

Count

		Total Household income				Total
		0-14,999	15-29,999	30-49,999	50,000+	
Age	18-35		1	1	1	3
	36-50	4	8	3	3	18
	51-65	4	3	3	2	12
	66+	2	2			4
Total		10	14	7	6	37

Table 38. Cross tabulation (Gender vs. occupation)

Gender * Occupation Crosstabulation

Count

		Occupation					Total
		Retired	Senior management	Professional	Semi-skilled	Not working	
Gender	Male	10	2	3	11		26
	Female	5		2	1	3	11
Total		15	2	5	12	3	37

Table 39. Cross tabulation (Gender vs. total household income)

Gender * Total Household income Crosstabulation

Count

		Total Household income				Total
		0-14,999	15-29,999	30-49,999	50,000+	
Gender	Male	8	9	2	3	22
	Female	1	3	4	2	10
Total		9	12	6	5	32

Table 40. Cross-tabulation (Occupation vs. Total household income)

Occupation * Total Household income Crosstabulation

Count

		Total Household income				Total
		0-14,999	15-29,999	30-49,999	50,000+	
Occupation	Retired	4	5	2	1	12
	Senior management			1	2	3
	Professional	1	2		2	5
	Semi-skilled	5	6	2	1	14
	Not working		1	2		3
Total		10	14	7	6	37

Table 41. Cross-tabulation (Cavity Wall insulation vs. energy efficient boiler)

cavity wall insulation * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
cavity wall insulation	Yes	11	14	25
	No	5	12	17
Total		16	26	42

Table 42. Cross-tabulation (Cavity wall insulation vs. double glazing)

cavity wall insulation * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
cavity wall insulation	Yes	23	2	25
	No	10	7	17
Total		33	9	42

Table 43. Cross-tabulation (Loft insulation vs. energy efficient boiler)

loft insulation * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		
		Yes	No	Total
loft insulation	Yes	16	21	37
	No		5	5
Total		16	26	42

Table 44. Cross-tabulation (loft insulation vs. double glazing)

loft insulation * Double Glazing Crosstabulation

Count

		Double Glazing		
		Yes	No	Total
loft insulation	Yes	30	7	37
	No	3	2	5
Total		33	9	42

Table 45. Cross-tabulation (Loft insulation vs. cavity wall insulation)

loft insulation * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		
		Yes	No	Total
loft insulation	Yes	23	14	37
	No	2	3	5
Total		25	17	42

Table 46. Cross-tabulation (Double glazing vs. energy efficient boiler)

Double Glazing * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		
		Yes	No	Total
Double Glazing	Yes	13	20	33
	No	3	6	9
Total		16	26	42

Table 47. Cross-tabulations for Total Household Income vs installed energy efficiency measures

Total Household income * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
Total Household income	0-14,999	4	6	10
	15-29,999	5	9	14
	30-49,999	2	4	6
	50,000+	3	3	6
Total		14	22	36

Total Household income * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
Total Household income	0-14,999	6	4	10
	15-29,999	11	3	14
	30-49,999	3	3	6
	50,000+	2	4	6
Total		22	14	36

Total Household income * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
Total Household income	0-14,999	7	3	10
	15-29,999	13	1	14
	30-49,999	6		6
	50,000+	5	1	6
Total		31	5	36

Total Household income * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
Total Household income	0-14,999	7	3	10
	15-29,999	12	2	14
	30-49,999	6		6
	50,000+	4	2	6
Total		29	7	36

Table 48. Cross tabulations for Gender vs. installed energy efficiency measures

Gender * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
Gender	Male	11	16	27
	Female	4	6	10
Total		15	22	37

Gender * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
Gender	Male	16	11	27
	Female	6	4	10
Total		22	15	37

Gender * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
Gender	Male	24	3	27
	Female	8	2	10
Total		32	5	37

Gender * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
Gender	Male	22	5	27
	Female	7	3	10
Total		29	8	37

Table 49. Cross-tabulations for Age vs. installed energy efficiency measures

Age * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
Age	18-35		4	4
	36-50	4	15	19
	51-65	8	4	12
	66+	4	3	7
Total		16	26	42

Age * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
Age	18-35	1	3	4
	36-50	11	8	19
	51-65	9	3	12
	66+	4	3	7
Total		25	17	42

Age * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
Age	18-35	3	1	4
	36-50	16	3	19
	51-65	11	1	12
	66+	7		7
Total		37	5	42

Age * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
Age	18-35	4		4
	36-50	14	5	19
	51-65	10	2	12
	66+	5	2	7
Total		33	9	42

Table 50. Cross-tabulations for Occupation vs. installed energy efficiency measures

Occupation * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
Occupation	Retired	6	8	14
	Senior management	1	2	3
	Professional	1	4	5
	Semi-skilled	6	9	15
	Not working	2	2	4
Total		16	25	41

Occupation * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
Occupation	Retired	8	6	14
	Senior management	2	1	3
	Professional	1	4	5
	Semi-skilled	11	4	15
	Not working	3	1	4
Total		25	16	41

Occupation * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
Occupation	Retired	12	2	14
	Senior management	3		3
	Professional	4	1	5
	Semi-skilled	13	2	15
	Not working	4		4
Total		36	5	41

Occupation * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
Occupation	Retired	10	4	14
	Senior management	3		3
	Professional	4	1	5
	Semi-skilled	13	2	15
	Not working	3	1	4
Total		33	8	41

Table 51. Cross-tabulations for house location vs. installed energy efficiency measures

House location * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
House location	Urban	10	9	19
	Rural	6	17	23
Total		16	26	42

House location * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
House location	Urban	10	9	19
	Rural	15	8	23
Total		25	17	42

House location * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
House location	Urban	17	2	19
	Rural	20	3	23
Total		37	5	42

House location * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
House location	Urban	14	5	19
	Rural	19	4	23
Total		33	9	42

12.2 Comparisons of Means (Parametric Tests)

12.2.1 Comparison of Means for Attitudes

Table 52. Table of means for the system constructs (all responses)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	42	10.86	2.465	.380
There is a high level of grant	42	7.31	3.453	.533
Solar systems are an appreciating asset	41	5.00	2.636	.412
The systems are hidden away	42	5.24	2.801	.432
Attractive	41	6.49	2.785	.435
Solar systems needs less maintenance than existing heating systems	41	4.98	3.205	.501
Reduces carbon emissions	43	2.49	2.798	.427
Reduces pollution	43	1.72	1.517	.231
Clean	43	1.91	2.158	.329
Generates savings	42	4.69	4.069	.628
Acts all of the time	43	4.70	3.583	.546
Natural	43	4.53	4.239	.646
Solar systems provide a comprehensive solution for hot water and electricity	42	4.38	2.641	.407
Home Improvement	43	3.12	2.602	.397
affordable technology	41	6.15	3.698	.578
Could develop in the future	43	1.98	1.263	.193
Might help sell a house any faster	43	5.70	2.924	.446
Adds value to a property	43	5.37	2.920	.445
Provides a visual statement of beliefs	43	4.63	3.288	.501
Will be more widespread in the future	43	2.07	1.352	.206
Solar power is compatible with modern living	43	2.05	1.479	.226
Simple to install in a property	41	5.32	3.424	.535
safe form of power generation	43	1.60	1.198	.183
The positioning of solar panels does not affect the visual landscape	43	4.95	3.754	.572

Table 53. One sample t-tests of the system constructs (all responses)

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Solar has a short payback	28.544	41	.000	10.86	10.09	11.63
There is a high level of grant	13.717	41	.000	7.31	6.23	8.39
Solar systems are an appreciating asset	12.144	40	.000	5.00	4.17	5.83
The systems are hidden away	12.120	41	.000	5.24	4.37	6.11
Attractive	14.917	40	.000	6.49	5.61	7.37
Solar systems needs less maintenance than existing heating systems	9.939	40	.000	4.98	3.96	5.99
Reduces carbon emissions	5.832	42	.000	2.49	1.63	3.35
Reduces pollution	7.439	42	.000	1.72	1.25	2.19
Clean	5.794	42	.000	1.91	1.24	2.57
Generates savings	7.470	41	.000	4.69	3.42	5.96
Acts all of the time	8.598	42	.000	4.70	3.60	5.80
Natural	7.015	42	.000	4.53	3.23	5.84
Solar systems provide a comprehensive solution for hot water and electricity	10.752	41	.000	4.38	3.56	5.20
Home Improvement	7.853	42	.000	3.12	2.32	3.92
affordable technology	10.641	40	.000	6.15	4.98	7.31
Could develop in the future	10.265	42	.000	1.98	1.59	2.37
Might help sell a house any faster	12.778	42	.000	5.70	4.80	6.60
Adds value to a property	12.065	42	.000	5.37	4.47	6.27
Provides a visual statement of beliefs	9.230	42	.000	4.63	3.62	5.64
Will be more widespread in the future	10.038	42	.000	2.07	1.65	2.49
Solar power is compatible with modern living	9.072	42	.000	2.05	1.59	2.50
Simple to install in a property	9.944	40	.000	5.32	4.24	6.40
safe form of power generation	8.783	42	.000	1.60	1.24	1.97
The positioning of solar panels does not affect the visual landscape	8.653	42	.000	4.95	3.80	6.11

Figure 15. Key to constructs of Solar Power systems

No	constructs
1	Solar has a short payback
2	There is a high level of grant
3	Solar systems are an appreciating asset
4	The systems are hidden away
5	Attractive
6	Maintenance free
7	Reduces carbon emissions
8	Reduces pollution
9	Clean
10	Generates savings
11	Acts all of the time
12	Natural
13	Solar systems provide a comprehensive solution for hot water and electricity
14	Home Improvement
15	Affordable technology
16	Could develop in the future
17	Might help sell a house any faster
18	Adds value to a property
19	Provides a visual statement of beliefs
20	Will be more widespread in the future
21	Solar power is compatible with modern living
22	Simple to install in a property
23	Safe form of power generation
24	The positioning of solar panels does not affect the visual landscape

Figure 16. Graph showing attitudes to constructs of Relative Advantage

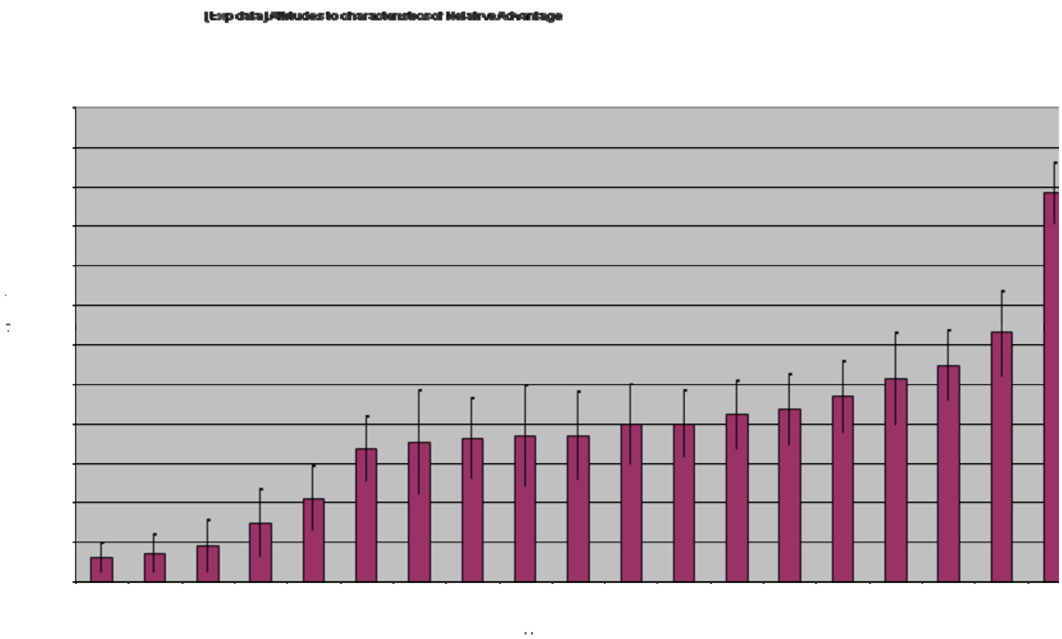


Figure 17. Graph showing attitudes to constructs of compatibility

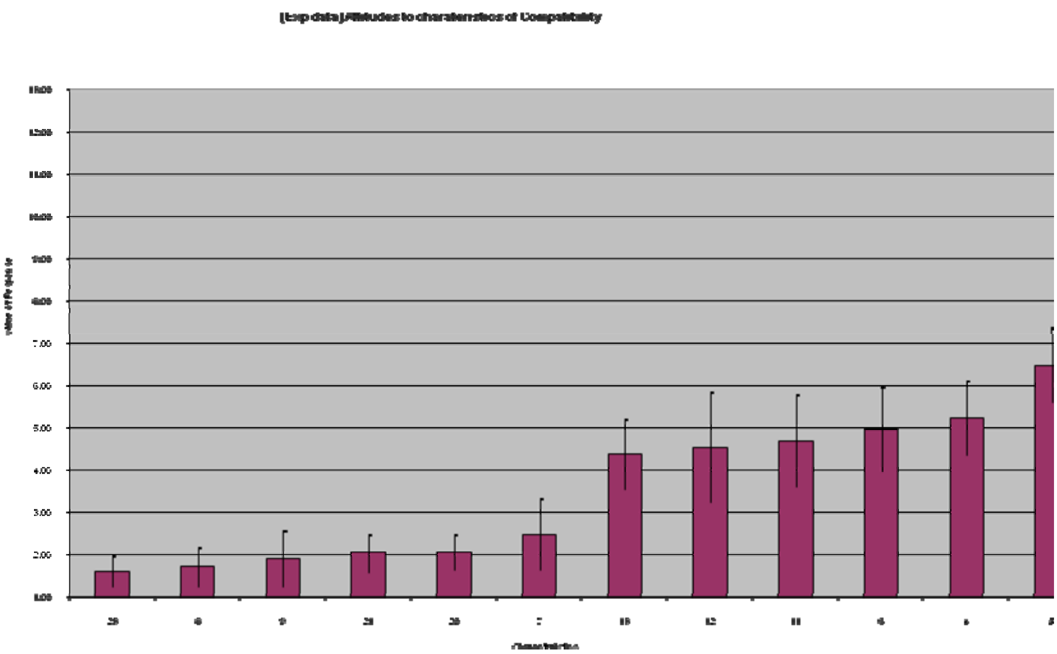


Figure 18. Graph showing attitudes to constructs of complexity

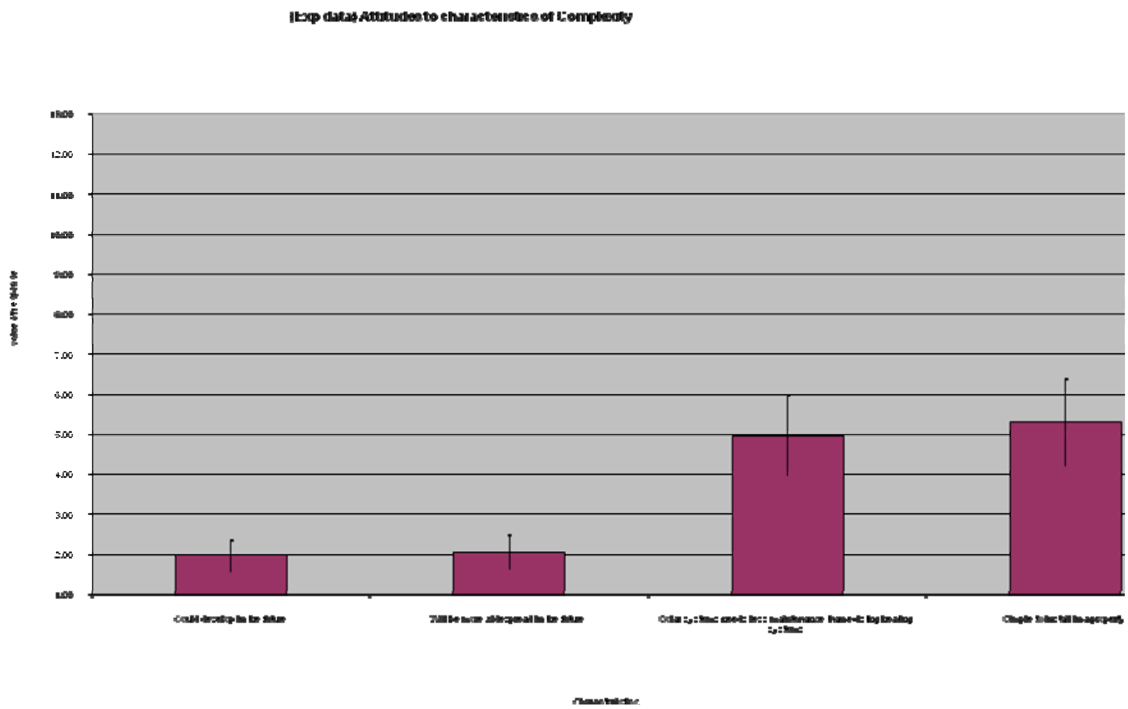
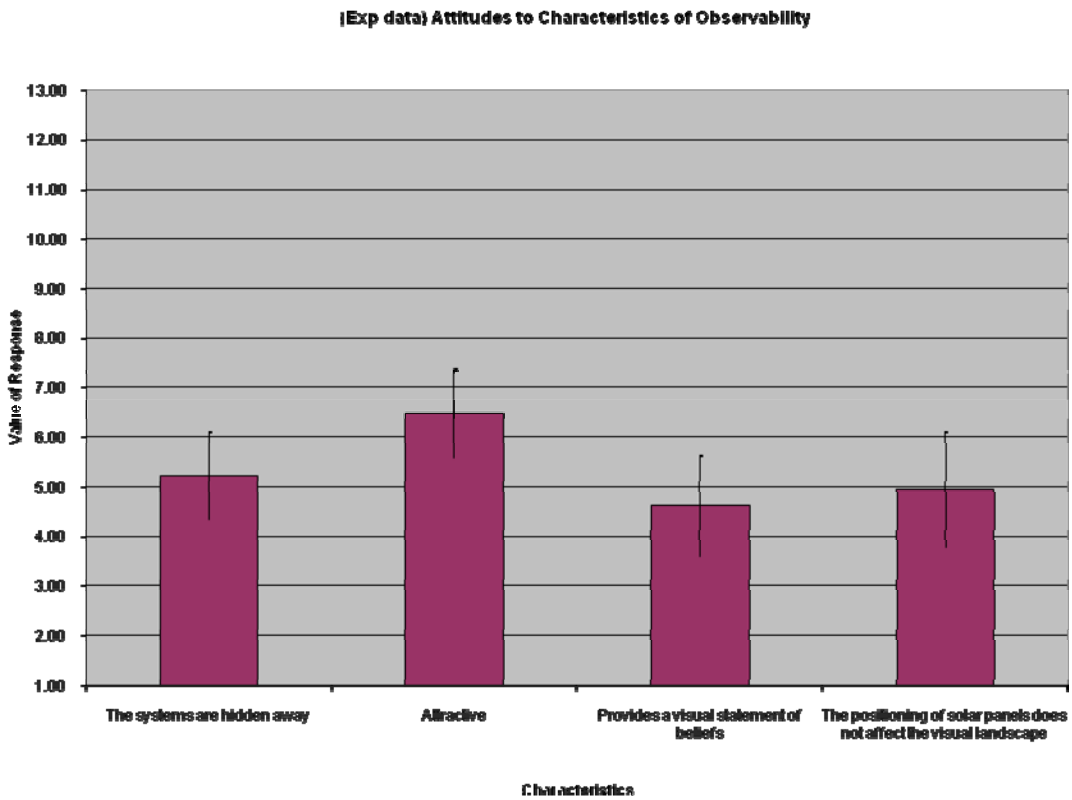


Figure 19. Graph showing attitudes to constructs of Observability



12.2.2 Comparison of means within groups

Table 54. Comparison of Means (Male vs. Female)

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Male	27	10.52	2.751	.529
	Female	10	11.20	1.814	.573
There is a high level of grant	Male	27	7.37	3.671	.706
	Female	10	8.20	3.048	.964
Solar systems are an appreciating asset	Male	25	4.88	2.651	.530
	Female	11	5.27	2.611	.787
The systems are hidden away	Male	27	4.96	2.488	.479
	Female	10	6.00	3.127	.989
Attractive	Male	26	6.62	2.593	.509
	Female	10	6.50	3.504	1.108
Solar systems needs less maintenance than	Male	26	4.73	3.157	.619
	Female	10	5.30	3.164	1.001
Reduces carbon emissions	Male	27	2.78	3.250	.626
	Female	11	2.45	2.018	.608
Reduces pollution	Male	27	1.52	1.221	.235
	Female	11	2.18	2.040	.615
Clean	Male	27	1.67	1.387	.267
	Female	11	2.73	3.636	1.096
Generates savings	Male	26	4.04	4.181	.820
	Female	11	6.00	4.266	1.286
Acts all of the time	Male	27	4.30	3.528	.679
	Female	11	4.91	3.590	1.083
Natural	Male	27	5.78	4.726	.909
	Female	11	2.45	2.162	.652
Solar systems provide a comprehensive solution	Male	26	4.46	2.846	.558
	Female	11	4.00	2.366	.714
Home Improvement	Male	27	2.93	2.129	.410
	Female	11	3.00	3.606	1.087
affordable technology	Male	26	6.35	3.730	.732
	Female	10	5.60	3.718	1.176
Could develop in the future	Male	27	2.00	1.271	.245
	Female	11	1.91	1.446	.436
Might help sell a house any faster	Male	27	5.52	3.179	.612
	Female	11	6.09	1.814	.547
Adds value to a property	Male	27	5.19	3.151	.606
	Female	11	5.45	1.635	.493
Provides a visual statement of beliefs	Male	27	4.59	3.320	.639
	Female	11	5.09	3.859	1.163
Will be more widespread in the future	Male	27	1.81	1.145	.220
	Female	11	2.36	1.567	.472
Solar power is compatible with modern living	Male	27	1.89	1.219	.235
	Female	11	2.09	1.578	.476
Simple to install in a property	Male	26	5.92	3.417	.670
	Female	10	4.60	3.204	1.013
safe form of power generation	Male	27	1.41	.888	.171
	Female	11	1.91	1.578	.476
The positioning of solar panels does not affect the	Male	27	4.33	3.486	.671
	Female	11	6.55	4.390	1.324

Table 55. Equality of variances and Equality of means (male vs. female)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.899	.350	-.724	35	.474	-.68	.941	-2.593	1.230
	Equal variances not assumed			-.873	24.672	.391	-.68	.780	-2.290	.927
There is a high level of grant	Equal variances assumed	.430	.516	-.637	35	.529	-.83	1.303	-3.476	1.816
	Equal variances not assumed			-.694	19.335	.496	-.83	1.195	-3.328	1.668
Solar systems are an appreciating asset	Equal variances assumed	.098	.756	-.411	34	.683	-.39	.955	-2.333	1.548
	Equal variances not assumed			-.414	19.458	.684	-.39	.949	-2.376	1.591
The systems are hidden away	Equal variances assumed	.294	.591	-1.050	35	.301	-1.04	.987	-3.041	.967
	Equal variances not assumed			-.944	13.460	.362	-1.04	1.099	-3.402	1.328
Attractive	Equal variances assumed	.660	.422	.108	34	.914	.12	1.065	-2.049	2.280
	Equal variances not assumed			.095	12.985	.926	.12	1.219	-2.519	2.750
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.083	.775	-.484	34	.631	-.57	1.175	-2.958	1.819
	Equal variances not assumed			-.484	16.347	.635	-.57	1.177	-3.059	1.921
Reduces carbon emissions	Equal variances assumed	1.246	.272	.305	36	.762	.32	1.059	-1.824	2.470
	Equal variances not assumed			.370	29.592	.714	.32	.873	-1.460	2.106
Reduces pollution	Equal variances assumed	4.585	.039	-1.241	36	.223	-.66	.534	-1.747	.421
	Equal variances not assumed			-1.007	13.022	.332	-.66	.659	-2.086	.759
Clean	Equal variances assumed	5.784	.021	-1.318	36	.196	-1.06	.805	-2.693	.571
	Equal variances not assumed			-.940	11.205	.367	-1.06	1.128	-3.538	1.417
Generates savings	Equal variances assumed	.012	.913	-1.297	35	.203	-1.96	1.513	-5.032	1.109
	Equal variances not assumed			-1.286	18.552	.214	-1.96	1.525	-5.159	1.236
Acts all of the time	Equal variances assumed	.246	.623	-.483	36	.632	-.61	1.268	-3.185	1.959
	Equal variances not assumed			-.480	18.325	.637	-.61	1.278	-3.294	2.068
Natural	Equal variances assumed	11.122	.002	2.226	36	.032	3.32	1.493	.295	6.352
	Equal variances not assumed			2.970	35.333	.005	3.32	1.119	1.052	5.594
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.593	.447	.472	35	.640	.46	.977	-1.523	2.446
	Equal variances not assumed			.510	22.597	.615	.46	.906	-1.414	2.337
Home Improvement	Equal variances assumed	1.141	.293	-.079	36	.938	-.07	.939	-1.978	1.829
	Equal variances not assumed			-.064	12.942	.950	-.07	1.162	-2.585	2.437
affordable technology	Equal variances assumed	.003	.959	.538	34	.594	.75	1.387	-2.072	3.565
	Equal variances not assumed			.539	16.432	.597	.75	1.385	-2.183	3.675
Could develop in the future	Equal variances assumed	.212	.648	.192	36	.849	.09	.473	-.868	1.050
	Equal variances not assumed			.182	16.651	.858	.09	.500	-.965	1.147
Might help sell a house any faster	Equal variances assumed	3.411	.073	-.558	36	.580	-.57	1.025	-2.651	1.507
	Equal variances not assumed			-.697	31.631	.491	-.57	.821	-2.245	1.100
Adds value to a property	Equal variances assumed	3.095	.087	-.268	36	.790	-.27	1.006	-2.310	1.771
	Equal variances not assumed			-.345	33.583	.732	-.27	.781	-1.858	1.319
Provides a visual statement of beliefs	Equal variances assumed	.819	.371	-.401	36	.691	-.50	1.244	-3.021	2.025
	Equal variances not assumed			-.375	16.367	.712	-.50	1.327	-3.307	2.310
Will be more widespread in the future	Equal variances assumed	2.216	.145	-1.202	36	.237	-.55	.456	-1.475	.377
	Equal variances not assumed			-1.053	14.559	.310	-.55	.521	-1.663	.565
Solar power is compatible with modern living	Equal variances assumed	2.819	.102	-.425	36	.673	-.20	.475	-1.166	.762
	Equal variances not assumed			-.381	15.113	.709	-.20	.531	-1.332	.928
Simple to install in a property	Equal variances assumed	.421	.521	1.058	34	.298	1.32	1.251	-1.219	3.865
	Equal variances not assumed			1.089	17.396	.291	1.32	1.215	-1.235	3.882
safe form of power generation	Equal variances assumed	8.886	.005	-1.249	36	.220	-.50	.402	-1.317	.313
	Equal variances not assumed			-.992	12.667	.340	-.50	.506	-1.597	.594
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	2.395	.130	-1.645	36	.109	-2.21	1.345	-4.939	.515
	Equal variances not assumed			-1.491	15.407	.156	-2.21	1.484	-5.368	.944

Table 56. Comparison of Means (Age over 50 vs Age under 50)

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 3	20	10.65	2.661	.595
	< 3	22	11.05	2.319	.494
There is a high level of grant	>= 3	20	6.95	2.819	.630
	< 3	22	7.64	3.983	.849
Solar systems are an appreciating asset	>= 3	19	4.95	1.985	.455
	< 3	22	5.05	3.139	.669
The systems are hidden away	>= 3	20	5.25	3.024	.676
	< 3	22	5.23	2.654	.566
Attractive	>= 3	20	6.35	2.519	.563
	< 3	21	6.62	3.074	.671
Solar systems needs less maintenance than	>= 3	20	5.65	3.588	.802
	< 3	21	4.33	2.726	.595
Reduces carbon emissions	>= 3	20	2.60	3.185	.712
	< 3	23	2.39	2.482	.517
Reduces pollution	>= 3	20	1.45	.999	.223
	< 3	23	1.96	1.846	.385
Clean	>= 3	20	1.55	1.050	.235
	< 3	23	2.22	2.779	.579
Generates savings	>= 3	20	5.25	4.241	.948
	< 3	22	4.18	3.936	.839
Acts all of the time	>= 3	20	5.90	3.493	.781
	< 3	23	3.65	3.393	.707
Natural	>= 3	20	5.05	4.536	1.014
	< 3	23	4.09	4.010	.836
Solar systems provide a comprehensive solution	>= 3	20	4.60	2.873	.642
	< 3	22	4.18	2.462	.525
Home Improvement	>= 3	20	3.15	2.134	.477
	< 3	23	3.09	2.999	.625
affordable technology	>= 3	20	5.70	3.358	.751
	< 3	21	6.57	4.032	.880
Could develop in the future	>= 3	20	1.80	1.152	.258
	< 3	23	2.13	1.359	.283
Might help sell a house any faster	>= 3	20	6.45	2.724	.609
	< 3	23	5.04	2.992	.624
Adds value to a property	>= 3	20	6.15	2.796	.625
	< 3	23	4.70	2.914	.608
Provides a visual statement of beliefs	>= 3	20	5.15	3.297	.737
	< 3	23	4.17	3.284	.685
Will be more widespread in the future	>= 3	20	2.25	1.372	.307
	< 3	23	1.91	1.345	.281
Solar power is compatible with modern living	>= 3	20	1.95	1.395	.312
	< 3	23	2.13	1.576	.329
Simple to install in a property	>= 3	20	5.55	3.410	.763
	< 3	21	5.10	3.506	.765
safe form of power generation	>= 3	20	1.75	1.372	.307
	< 3	23	1.48	1.039	.217
The positioning of solar panels does not affect the	>= 3	20	5.95	4.236	.947
	< 3	23	4.09	3.118	.650

Table 57. Equality of Variance and Means (age u.50 vs Age o.50)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.114	.737	-.515	40	.610	-.40	.769	-1.949	1.158
	Equal variances not assumed			-.511	37.934	.612	-.40	.774	-1.962	1.171
There is a high level of grant	Equal variances assumed	3.870	.056	-.639	40	.527	-.69	1.075	-2.859	1.486
	Equal variances not assumed			-.649	37.825	.520	-.69	1.057	-2.827	1.455
Solar systems are an appreciating asset	Equal variances assumed	6.259	.017	-.117	39	.907	-.10	.836	-1.789	1.593
	Equal variances not assumed			-.121	35.957	.904	-.10	.810	-1.740	1.544
The systems are hidden away	Equal variances assumed	.529	.471	.026	40	.979	.02	.876	-1.748	1.793
	Equal variances not assumed			.026	38.044	.980	.02	.882	-1.762	1.807
Attractive	Equal variances assumed	.733	.397	-.306	39	.761	-.27	.880	-2.049	1.511
	Equal variances not assumed			-.307	38.171	.760	-.27	.876	-2.042	1.504
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	1.971	.168	1.327	39	.192	1.32	.992	-.690	3.323
	Equal variances not assumed			1.318	35.458	.196	1.32	.999	-.710	3.343
Reduces carbon emissions	Equal variances assumed	.455	.504	.241	41	.811	.21	.865	-1.538	1.956
	Equal variances not assumed			.237	35.747	.814	.21	.880	-1.577	1.995
Reduces pollution	Equal variances assumed	2.936	.094	-1.095	41	.280	-.51	.463	-1.441	.428
	Equal variances not assumed			-1.138	34.746	.263	-.51	.445	-1.410	.397
Clean	Equal variances assumed	3.036	.089	-1.012	41	.318	-.67	.660	-2.000	.665
	Equal variances not assumed			-1.067	28.915	.295	-.67	.625	-1.946	.612
Generates savings	Equal variances assumed	.023	.879	.847	40	.402	1.07	1.262	-1.482	3.618
	Equal variances not assumed			.844	38.850	.404	1.07	1.266	-1.493	3.630
Acts all of the time	Equal variances assumed	.350	.557	2.138	41	.039	2.25	1.052	.124	4.372
	Equal variances not assumed			2.133	39.818	.039	2.25	1.054	.118	4.378
Natural	Equal variances assumed	.699	.408	.739	41	.464	.96	1.303	-1.669	3.595
	Equal variances not assumed			.733	38.318	.468	.96	1.315	-1.697	3.624
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	1.572	.217	.508	40	.614	.42	.823	-1.246	2.082
	Equal variances not assumed			.504	37.654	.617	.42	.830	-1.262	2.098
Home Improvement	Equal variances assumed	1.005	.322	.078	41	.938	.06	.805	-1.563	1.689
	Equal variances not assumed			.080	39.555	.937	.06	.787	-1.527	1.653
affordable technology	Equal variances assumed	2.004	.165	-.750	39	.458	-.87	1.162	-3.222	1.479
	Equal variances not assumed			-.753	38.335	.456	-.87	1.157	-3.212	1.469
Could develop in the future	Equal variances assumed	.670	.418	-.853	41	.399	-.33	.387	-1.113	.452
	Equal variances not assumed			-.863	40.980	.393	-.33	.383	-1.104	.443
Might help sell a house any faster	Equal variances assumed	1.157	.288	1.602	41	.117	1.41	.878	-.366	3.179
	Equal variances not assumed			1.613	40.901	.114	1.41	.872	-.354	3.167
Adds value to a property	Equal variances assumed	.016	.900	1.663	41	.104	1.45	.874	-.312	3.220
	Equal variances not assumed			1.668	40.579	.103	1.45	.872	-.307	3.216
Provides a visual statement of beliefs	Equal variances assumed	.050	.825	.970	41	.338	.98	1.006	-1.056	3.008
	Equal variances not assumed			.970	40.130	.338	.98	1.006	-1.057	3.010
Will be more widespread in the future	Equal variances assumed	.090	.765	.812	41	.422	.34	.415	-.501	1.175
	Equal variances not assumed			.811	39.944	.422	.34	.416	-.503	1.177
Solar power is compatible with modern living	Equal variances assumed	.424	.519	-.395	41	.695	-.18	.457	-1.103	.742
	Equal variances not assumed			-.398	40.982	.692	-.18	.453	-1.095	.734
Simple to install in a property	Equal variances assumed	.055	.816	.421	39	.676	.45	1.081	-1.732	2.641
	Equal variances not assumed			.421	38.980	.676	.45	1.080	-1.730	2.640
safe form of power generation	Equal variances assumed	1.989	.166	.738	41	.465	.27	.368	-.472	1.016
	Equal variances not assumed			.724	35.130	.474	.27	.375	-.490	1.034
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	6.022	.018	1.657	41	.105	1.86	1.125	-.408	4.134
	Equal variances not assumed			1.622	34.502	.114	1.86	1.149	-.470	4.197

Table 58. Comparison of means (Retired vs. Working)

Group Statistics

	Occupation	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 2	27	10.59	2.635	.507
	< 2	14	11.21	2.155	.576
There is a high level of grant	>= 2	27	7.15	3.559	.685
	< 2	14	7.21	3.118	.833
Solar systems are an appreciating asset	>= 2	26	5.27	2.892	.567
	< 2	14	4.36	2.098	.561
The systems are hidden away	>= 2	27	5.48	2.651	.510
	< 2	14	4.93	3.174	.848
Attractive	>= 2	26	6.92	2.497	.490
	< 2	14	5.79	3.286	.878
Solar systems needs less maintenance than	>= 2	26	4.92	3.285	.644
	< 2	14	4.71	2.972	.794
Reduces carbon emissions	>= 2	27	1.93	2.093	.403
	< 2	15	3.20	3.570	.922
Reduces pollution	>= 2	27	1.59	1.394	.268
	< 2	15	1.60	1.121	.289
Clean	>= 2	27	1.74	2.330	.448
	< 2	15	1.87	1.407	.363
Generates savings	>= 2	26	3.46	3.215	.631
	< 2	15	6.27	4.431	1.144
Acts all of the time	>= 2	27	4.22	3.523	.678
	< 2	15	5.40	3.757	.970
Natural	>= 2	27	4.00	3.711	.714
	< 2	15	4.93	4.743	1.225
Solar systems provide a comprehensive solution	>= 2	26	4.08	2.365	.464
	< 2	15	4.47	2.669	.689
Home Improvement	>= 2	27	2.96	2.941	.566
	< 2	15	3.33	2.024	.523
affordable technology	>= 2	26	6.08	3.815	.748
	< 2	14	5.79	3.215	.859
Could develop in the future	>= 2	27	2.04	1.315	.253
	< 2	15	1.93	1.223	.316
Might help sell a house any faster	>= 2	27	5.37	2.937	.565
	< 2	15	6.40	2.947	.761
Adds value to a property	>= 2	27	4.93	2.800	.539
	< 2	15	6.27	3.105	.802
Provides a visual statement of beliefs	>= 2	27	3.89	2.764	.532
	< 2	15	5.87	3.925	1.014
Will be more widespread in the future	>= 2	27	2.00	1.414	.272
	< 2	15	2.27	1.280	.330
Solar power is compatible with modern living	>= 2	27	2.04	1.506	.290
	< 2	15	2.13	1.506	.389
Simple to install in a property	>= 2	26	5.00	3.007	.590
	< 2	14	5.50	3.995	1.068
safe form of power generation	>= 2	27	1.48	1.014	.195
	< 2	15	1.87	1.506	.389
The positioning of solar panels does not affect the	>= 2	27	4.85	3.527	.679
	< 2	15	5.33	4.287	1.107

Table 59. Equality of Variances and Means (Retired vs. Working)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.337	.565	-.760	39	.452	-.62	.818	-2.277	1.034
	Equal variances not assumed			-.810	31.505	.424	-.62	.767	-2.186	.942
There is a high level of grant	Equal variances assumed	.357	.553	-.059	39	.953	-.07	1.126	-2.343	2.211
	Equal variances not assumed			-.061	29.723	.952	-.07	1.079	-2.270	2.138
Solar systems are an appreciating asset	Equal variances assumed	2.978	.093	1.039	38	.305	.91	.878	-.865	2.689
	Equal variances not assumed			1.144	34.457	.261	.91	.798	-.708	2.532
The systems are hidden away	Equal variances assumed	.767	.387	.592	39	.557	.55	.934	-1.336	2.442
	Equal variances not assumed			.559	22.629	.582	.55	.990	-1.497	2.602
Attractive	Equal variances assumed	2.227	.144	1.229	38	.227	1.14	.926	-.736	3.011
	Equal variances not assumed			1.131	21.271	.271	1.14	1.005	-.952	3.227
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.441	.511	.198	38	.844	.21	1.055	-1.926	2.344
	Equal variances not assumed			.204	29.166	.840	.21	1.023	-1.883	2.300
Reduces carbon emissions	Equal variances assumed	5.418	.025	-1.464	40	.151	-1.27	.870	-3.033	.485
	Equal variances not assumed			-1.267	19.474	.220	-1.27	1.006	-3.376	.828
Reduces pollution	Equal variances assumed	.062	.804	-.018	40	.986	-.01	.420	-.857	.842
	Equal variances not assumed			-.019	34.620	.985	-.01	.395	-.809	.794
Clean	Equal variances assumed	.011	.919	-.190	40	.850	-.13	.662	-1.463	1.212
	Equal variances not assumed			-.218	39.625	.828	-.13	.577	-1.293	1.041
Generates savings	Equal variances assumed	3.452	.071	-2.339	39	.025	-2.81	1.199	-5.231	-.380
	Equal variances not assumed			-2.147	22.627	.043	-2.81	1.306	-5.510	-.100
Acts all of the time	Equal variances assumed	.049	.826	-1.014	40	.317	-1.18	1.161	-3.525	1.169
	Equal variances not assumed			-.995	27.487	.328	-1.18	1.183	-3.604	1.248
Natural	Equal variances assumed	1.038	.314	-.707	40	.484	-.93	1.321	-3.603	1.736
	Equal variances not assumed			-.658	23.667	.517	-.93	1.418	-3.861	1.995
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.233	.632	-.485	39	.630	-.39	.804	-2.015	1.236
	Equal variances not assumed			-.469	26.511	.643	-.39	.831	-2.096	1.316
Home Improvement	Equal variances assumed	1.101	.300	-.433	40	.667	-.37	.855	-2.099	1.359
	Equal variances not assumed			-.481	37.979	.633	-.37	.770	-1.930	1.189
affordable technology	Equal variances assumed	.966	.332	.243	38	.810	.29	1.200	-2.139	2.721
	Equal variances not assumed			.256	30.939	.800	.29	1.139	-2.033	2.615
Could develop in the future	Equal variances assumed	.166	.686	.251	40	.803	.10	.413	-.732	.939
	Equal variances not assumed			.256	30.901	.799	.10	.405	-.722	.929
Might help sell a house any faster	Equal variances assumed	.694	.410	-1.087	40	.283	-1.03	.947	-2.944	.884
	Equal variances not assumed			-1.086	28.964	.286	-1.03	.948	-2.968	.909
Adds value to a property	Equal variances assumed	.154	.697	-1.431	40	.160	-1.34	.937	-3.235	.553
	Equal variances not assumed			-1.388	26.589	.177	-1.34	.966	-3.324	.643
Provides a visual statement of beliefs	Equal variances assumed	3.853	.057	-1.908	40	.064	-1.98	1.037	-4.073	.117
	Equal variances not assumed			-1.728	21.882	.098	-1.98	1.145	-4.352	.397
Will be more widespread in the future	Equal variances assumed	.202	.655	-.605	40	.549	-.27	.441	-1.157	.624
	Equal variances not assumed			-.623	31.604	.538	-.27	.428	-1.139	.606
Solar power is compatible with modern living	Equal variances assumed	.001	.970	-.199	40	.844	-.10	.485	-1.076	.884
	Equal variances not assumed			-.199	29.055	.844	-.10	.485	-1.088	.895
Simple to install in a property	Equal variances assumed	2.558	.118	-.447	38	.658	-.50	1.120	-2.767	1.767
	Equal variances not assumed			-.410	21.117	.686	-.50	1.220	-3.036	2.036
safe form of power generation	Equal variances assumed	3.053	.088	-.989	40	.328	-.39	.389	-1.172	.402
	Equal variances not assumed			-.886	21.222	.386	-.39	.435	-1.289	.519
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	2.132	.152	-.392	40	.697	-.48	1.227	-2.961	1.998
	Equal variances not assumed			-.371	24.631	.714	-.48	1.298	-3.158	2.195

Table 60. Comparison of Means (income over 50k vs income under 50k)

Group Statistics

	Total Household income	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 4	6	11.50	1.517	.619
	< 4	30	10.53	2.688	.491
There is a high level of grant	>= 4	6	9.83	2.994	1.222
	< 4	30	6.50	3.442	.628
Solar systems are an appreciating asset	>= 4	6	6.33	2.733	1.116
	< 4	29	4.76	2.695	.500
The systems are hidden away	>= 4	6	6.67	1.966	.803
	< 4	30	4.77	2.885	.527
Attractive	>= 4	6	9.00	2.530	1.033
	< 4	30	6.03	2.798	.511
Solar systems needs less maintenance than	>= 4	6	6.50	3.886	1.586
	< 4	30	4.23	2.712	.495
Reduces carbon emissions	>= 4	6	2.17	2.401	.980
	< 4	31	2.45	3.009	.540
Reduces pollution	>= 4	6	1.00	.000	.000
	< 4	31	1.71	1.442	.259
Clean	>= 4	6	3.00	4.899	2.000
	< 4	31	1.45	.888	.160
Generates savings	>= 4	6	5.50	2.510	1.025
	< 4	30	4.57	4.329	.790
Acts all of the time	>= 4	6	5.50	5.282	2.156
	< 4	31	4.52	3.472	.624
Natural	>= 4	6	7.33	4.590	1.874
	< 4	31	3.81	3.953	.710
Solar systems provide a comprehensive solution	>= 4	6	5.67	2.338	.955
	< 4	30	3.70	2.351	.429
Home Improvement	>= 4	6	2.83	2.401	.980
	< 4	31	3.13	2.766	.497
affordable technology	>= 4	6	9.00	4.517	1.844
	< 4	30	5.40	3.223	.588
Could develop in the future	>= 4	6	2.50	1.517	.619
	< 4	31	1.81	1.138	.204
Might help sell a house any faster	>= 4	6	6.67	3.882	1.585
	< 4	31	5.32	2.797	.502
Adds value to a property	>= 4	6	5.33	2.338	.955
	< 4	31	5.00	2.933	.527
Provides a visual statement of beliefs	>= 4	6	4.33	3.502	1.430
	< 4	31	4.29	3.298	.592
Will be more widespread in the future	>= 4	6	2.50	1.761	.719
	< 4	31	1.97	1.303	.234
Solar power is compatible with modern living	>= 4	6	3.00	1.897	.775
	< 4	31	1.84	1.344	.241
Simple to install in a property	>= 4	6	7.50	3.564	1.455
	< 4	30	4.63	3.253	.594
safe form of power generation	>= 4	6	2.00	1.265	.516
	< 4	31	1.48	1.122	.201
The positioning of solar panels does not affect the	>= 4	6	5.33	3.502	1.430
	< 4	31	4.68	3.902	.701

Table 61. Equality of Variances and Means (income over 50k vs income under 50k)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	2.049	.161	.848	34	.402	.97	1.140	-1.350	3.284
	Equal variances not assumed			1.224	12.409	.244	.97	.790	-.748	2.682
There is a high level of grant	Equal variances assumed	.051	.822	2.205	34	.034	3.33	1.511	.262	6.405
	Equal variances not assumed			2.425	7.896	.042	3.33	1.375	.156	6.510
Solar systems are an appreciating asset	Equal variances assumed	.594	.446	1.300	33	.203	1.57	1.211	-.889	4.039
	Equal variances not assumed			1.288	7.163	.238	1.57	1.223	-1.303	4.453
The systems are hidden away	Equal variances assumed	2.807	.103	1.534	34	.134	1.90	1.238	-.617	4.417
	Equal variances not assumed			1.979	9.915	.076	1.90	.960	-.242	4.042
Attractive	Equal variances assumed	.047	.829	2.404	34	.022	2.97	1.234	.458	5.475
	Equal variances not assumed			2.575	7.666	.034	2.97	1.152	.289	5.644
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.335	.566	1.739	34	.091	2.27	1.304	-.382	4.916
	Equal variances not assumed			1.364	6.012	.221	2.27	1.662	-1.798	6.331
Reduces carbon emissions	Equal variances assumed	.224	.639	-.218	35	.829	-.28	1.307	-2.938	2.368
	Equal variances not assumed			-.255	8.372	.805	-.28	1.119	-2.847	2.277
Reduces pollution	Equal variances assumed	4.823	.035	-1.192	35	.241	-.71	.595	-1.919	.499
	Equal variances not assumed			-2.740	30.000	.010	-.71	.259	-1.239	-.181
Clean	Equal variances assumed	19.843	.000	1.713	35	.095	1.55	.904	-.286	3.383
	Equal variances not assumed			.772	5.064	.475	1.55	2.006	-3.590	6.686
Generates savings	Equal variances assumed	3.070	.089	.508	34	.615	.93	1.839	-2.804	4.670
	Equal variances not assumed			.721	11.986	.485	.93	1.294	-1.887	3.753
Acts all of the time	Equal variances assumed	3.852	.058	.583	35	.564	.98	1.688	-2.443	4.410
	Equal variances not assumed			.438	5.865	.677	.98	2.245	-4.540	6.507
Natural	Equal variances assumed	.093	.762	1.952	35	.059	3.53	1.806	-.140	7.194
	Equal variances not assumed			1.760	6.516	.125	3.53	2.004	-1.284	8.337
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.021	.887	1.872	34	.070	1.97	1.051	-.168	4.102
	Equal variances not assumed			1.879	7.176	.101	1.97	1.047	-.496	4.429
Home Improvement	Equal variances assumed	.080	.779	-.244	35	.809	-.30	1.212	-2.756	2.164
	Equal variances not assumed			-.269	7.811	.795	-.30	1.099	-2.841	2.249
affordable technology	Equal variances assumed	.741	.395	2.338	34	.025	3.60	1.540	.470	6.730
	Equal variances not assumed			1.860	6.059	.112	3.60	1.936	-1.125	8.325
Could develop in the future	Equal variances assumed	.622	.436	1.297	35	.203	.69	.535	-.392	1.779
	Equal variances not assumed			1.064	6.137	.328	.69	.652	-.893	2.280
Might help sell a house any faster	Equal variances assumed	.008	.929	1.012	35	.318	1.34	1.328	-1.351	4.039
	Equal variances not assumed			.809	6.046	.449	1.34	1.662	-2.716	5.404
Adds value to a property	Equal variances assumed	.746	.394	.262	35	.795	.33	1.273	-2.252	2.919
	Equal variances not assumed			.306	8.379	.767	.33	1.090	-2.161	2.828
Provides a visual statement of beliefs	Equal variances assumed	.013	.910	.029	35	.977	.04	1.484	-2.971	3.057
	Equal variances not assumed			.028	6.830	.979	.04	1.548	-3.635	3.721
Will be more widespread in the future	Equal variances assumed	1.876	.180	.866	35	.392	.53	.615	-.716	1.780
	Equal variances not assumed			.704	6.106	.507	.53	.756	-1.310	2.374
Solar power is compatible with modern living	Equal variances assumed	.440	.511	1.813	35	.078	1.16	.641	-.139	2.462
	Equal variances not assumed			1.431	6.009	.202	1.16	.811	-.823	3.146
Simple to install in a property	Equal variances assumed	.000	.991	1.942	34	.060	2.87	1.476	-.133	5.867
	Equal variances not assumed			1.824	6.773	.112	2.87	1.571	-.875	6.608
safe form of power generation	Equal variances assumed	.495	.486	1.012	35	.318	.52	.510	-.519	1.551
	Equal variances not assumed			.931	6.612	.385	.52	.554	-.810	1.843
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.151	.700	.382	35	.705	.66	1.716	-2.828	4.140
	Equal variances not assumed			.412	7.618	.692	.66	1.592	-3.048	4.360

Table 62. Comparison of Means (income under 35k vs income over 35k)

Group Statistics

	Total Household income	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 3	13	10.92	2.362	.655
	< 3	23	10.57	2.677	.558
There is a high level of grant	>= 3	13	8.08	3.707	1.028
	< 3	23	6.48	3.423	.714
Solar systems are an appreciating asset	>= 3	13	5.46	2.757	.765
	< 3	22	4.77	2.742	.585
The systems are hidden away	>= 3	13	5.31	2.496	.692
	< 3	23	4.96	3.037	.633
Attractive	>= 3	13	7.15	3.023	.839
	< 3	23	6.17	2.902	.605
Solar systems needs less maintenance than	>= 3	13	5.08	3.353	.930
	< 3	23	4.35	2.822	.588
Reduces carbon emissions	>= 3	13	1.69	1.653	.458
	< 3	24	2.79	3.349	.684
Reduces pollution	>= 3	13	1.23	.599	.166
	< 3	24	1.79	1.587	.324
Clean	>= 3	13	2.15	3.313	.919
	< 3	24	1.46	.932	.190
Generates savings	>= 3	12	4.50	2.541	.733
	< 3	24	4.83	4.697	.959
Acts all of the time	>= 3	13	4.31	3.924	1.088
	< 3	24	4.88	3.722	.760
Natural	>= 3	13	4.38	4.234	1.174
	< 3	24	4.38	4.282	.874
Solar systems provide a comprehensive solution	>= 3	13	4.23	2.587	.717
	< 3	23	3.91	2.392	.499
Home Improvement	>= 3	13	2.77	2.204	.611
	< 3	24	3.25	2.938	.600
affordable technology	>= 3	13	6.46	3.908	1.084
	< 3	23	5.74	3.570	.744
Could develop in the future	>= 3	13	2.15	1.345	.373
	< 3	24	1.79	1.141	.233
Might help sell a house any faster	>= 3	13	6.54	2.933	.813
	< 3	24	5.00	2.919	.596
Adds value to a property	>= 3	13	5.23	2.166	.601
	< 3	24	4.96	3.155	.644
Provides a visual statement of beliefs	>= 3	13	4.62	3.820	1.059
	< 3	24	4.13	3.026	.618
Will be more widespread in the future	>= 3	13	2.38	1.557	.432
	< 3	24	1.88	1.262	.258
Solar power is compatible with modern living	>= 3	13	2.46	1.613	.447
	< 3	24	1.79	1.382	.282
Simple to install in a property	>= 3	13	5.77	3.219	.893
	< 3	23	4.74	3.558	.742
safe form of power generation	>= 3	13	1.69	1.182	.328
	< 3	24	1.50	1.142	.233
The positioning of solar panels does not affect the	>= 3	13	6.38	4.032	1.118
	< 3	24	3.92	3.450	.704

Table 63. Equality of Means and Variances (income over 35k vs income under 35k)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.325	.572	.401	34	.691	.36	.892	-1.454	2.170
	Equal variances not assumed			.416	27.770	.681	.36	.861	-1.406	2.121
There is a high level of grant	Equal variances assumed	.218	.644	1.307	34	.200	1.60	1.223	-.888	4.085
	Equal variances not assumed			1.277	23.388	.214	1.60	1.252	-.988	4.185
Solar systems are an appreciating asset	Equal variances assumed	.078	.782	.717	33	.479	.69	.961	-1.267	2.644
	Equal variances not assumed			.716	25.203	.481	.69	.963	-1.293	2.670
The systems are hidden away	Equal variances assumed	.558	.460	.354	34	.725	.35	.992	-1.664	2.367
	Equal variances not assumed			.374	29.297	.711	.35	.938	-1.567	2.269
Attractive	Equal variances assumed	.236	.630	.959	34	.344	.98	1.022	-1.097	3.057
	Equal variances not assumed			.948	24.177	.353	.98	1.034	-1.154	3.113
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.411	.526	.696	34	.491	.73	1.048	-1.401	2.859
	Equal variances not assumed			.662	21.640	.515	.73	1.101	-1.555	3.014
Reduces carbon emissions	Equal variances assumed	4.926	.033	-1.108	35	.276	-1.10	.993	-3.114	.916
	Equal variances not assumed			-1.336	34.834	.190	-1.10	.823	-2.770	.572
Reduces pollution	Equal variances assumed	3.891	.056	-1.221	35	.230	-.56	.459	-1.493	.372
	Equal variances not assumed			-1.540	32.394	.133	-.56	.364	-1.302	.181
Clean	Equal variances assumed	3.921	.056	.970	35	.339	.70	.717	-.760	2.151
	Equal variances not assumed			.741	13.037	.472	.70	.938	-1.331	2.722
Generates savings	Equal variances assumed	9.181	.005	-.229	34	.821	-.33	1.458	-3.297	2.630
	Equal variances not assumed			-.276	33.679	.784	-.33	1.207	-2.787	2.121
Acts all of the time	Equal variances assumed	.038	.847	-.434	35	.667	-.57	1.306	-3.219	2.084
	Equal variances not assumed			-.427	23.619	.673	-.57	1.327	-3.309	2.174
Natural	Equal variances assumed	.072	.790	.007	35	.995	.01	1.469	-2.972	2.991
	Equal variances not assumed			.007	24.979	.995	.01	1.464	-3.005	3.024
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.032	.860	.372	34	.712	.32	.854	-1.419	2.054
	Equal variances not assumed			.364	23.413	.719	.32	.874	-1.488	2.123
Home Improvement	Equal variances assumed	.550	.463	-.515	35	.610	-.48	.933	-2.374	1.413
	Equal variances not assumed			-.561	31.153	.579	-.48	.856	-2.227	1.265
affordable technology	Equal variances assumed	.121	.730	.564	34	.577	.72	1.281	-1.882	3.326
	Equal variances not assumed			.549	23.181	.588	.72	1.315	-1.996	3.441
Could develop in the future	Equal variances assumed	.697	.409	.866	35	.393	.36	.418	-.487	1.211
	Equal variances not assumed			.824	21.487	.419	.36	.440	-.551	1.275
Might help sell a house any faster	Equal variances assumed	.499	.485	1.528	35	.136	1.54	1.007	-.506	3.583
	Equal variances not assumed			1.526	24.633	.140	1.54	1.008	-.540	3.617
Adds value to a property	Equal variances assumed	2.392	.131	.277	35	.783	.27	.983	-1.723	2.268
	Equal variances not assumed			.309	32.816	.759	.27	.881	-1.520	2.065
Provides a visual statement of beliefs	Equal variances assumed	1.014	.321	.429	35	.671	.49	1.143	-1.830	2.811
	Equal variances not assumed			.400	20.321	.693	.49	1.226	-2.065	3.046
Will be more widespread in the future	Equal variances assumed	1.694	.202	1.080	35	.287	.51	.472	-.448	1.467
	Equal variances not assumed			1.014	20.696	.322	.51	.503	-.537	1.556
Solar power is compatible with modern living	Equal variances assumed	1.026	.318	1.327	35	.193	.67	.505	-.355	1.695
	Equal variances not assumed			1.266	21.658	.219	.67	.529	-.428	1.768
Simple to install in a property	Equal variances assumed	.761	.389	.863	34	.394	1.03	1.194	-1.397	3.457
	Equal variances not assumed			.888	27.217	.383	1.03	1.161	-1.350	3.411
safe form of power generation	Equal variances assumed	.602	.443	.483	35	.632	.19	.398	-.616	1.000
	Equal variances not assumed			.478	24.001	.637	.19	.402	-.638	1.023
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	1.576	.218	1.958	35	.058	2.47	1.260	-.091	5.027
	Equal variances not assumed			1.867	21.633	.075	2.47	1.322	-.276	5.211

Table 64. Comparison of Means (urban vs rural location)

Group Statistics

	House location	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Urban	19	11.05	1.779	.408
	Rural	23	10.70	2.945	.614
There is a high level of grant	Urban	19	6.21	3.409	.782
	Rural	23	8.22	3.288	.686
Solar systems are an appreciating asset	Urban	20	5.35	2.581	.577
	Rural	21	4.67	2.708	.591
The systems are hidden away	Urban	19	4.37	2.910	.668
	Rural	23	5.96	2.549	.532
Attractive	Urban	18	5.72	2.697	.636
	Rural	23	7.09	2.762	.576
Solar systems needs less maintenance than	Urban	18	5.44	3.714	.875
	Rural	23	4.61	2.776	.579
Reduces carbon emissions	Urban	20	2.65	2.739	.612
	Rural	23	2.35	2.902	.605
Reduces pollution	Urban	20	1.95	1.701	.380
	Rural	23	1.52	1.344	.280
Clean	Urban	20	1.85	1.565	.350
	Rural	23	1.96	2.602	.543
Generates savings	Urban	19	4.05	3.993	.916
	Rural	23	5.22	4.145	.864
Acts all of the time	Urban	20	4.00	3.325	.743
	Rural	23	5.30	3.759	.784
Natural	Urban	20	4.40	3.979	.890
	Rural	23	4.65	4.539	.946
Solar systems provide a comprehensive solution	Urban	20	4.30	2.774	.620
	Rural	22	4.45	2.577	.549
Home Improvement	Urban	20	2.65	1.755	.393
	Rural	23	3.52	3.146	.656
affordable technology	Urban	18	5.67	3.694	.871
	Rural	23	6.52	3.740	.780
Could develop in the future	Urban	20	2.15	1.461	.327
	Rural	23	1.83	1.072	.224
Might help sell a house any faster	Urban	20	4.55	2.164	.484
	Rural	23	6.70	3.169	.661
Adds value to a property	Urban	20	4.65	2.621	.586
	Rural	23	6.00	3.075	.641
Provides a visual statement of beliefs	Urban	20	4.50	3.472	.776
	Rural	23	4.74	3.194	.666
Will be more widespread in the future	Urban	20	2.00	1.376	.308
	Rural	23	2.13	1.359	.283
Solar power is compatible with modern living	Urban	20	1.90	1.373	.307
	Rural	23	2.17	1.586	.331
Simple to install in a property	Urban	18	5.94	3.404	.802
	Rural	23	4.83	3.433	.716
safe form of power generation	Urban	20	1.85	1.348	.302
	Rural	23	1.39	1.033	.215
The positioning of solar panels does not affect the	Urban	20	4.55	3.456	.773
	Rural	23	5.30	4.039	.842

Table 65. Equality of Means and Variances (urban vs rural location)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	3.115	.085	.463	40	.646	.36	.772	-1.203	1.917
	Equal variances not assumed			.484	36.917	.631	.36	.737	-1.137	1.851
There is a high level of grant	Equal variances assumed	.002	.964	-1.936	40	.060	-2.01	1.036	-4.102	.088
	Equal variances not assumed			-1.930	37.959	.061	-2.01	1.040	-4.112	.099
Solar systems are an appreciating asset	Equal variances assumed	.157	.694	.826	39	.414	.68	.827	-.989	2.356
	Equal variances not assumed			.827	39.000	.413	.68	.826	-.987	2.354
The systems are hidden away	Equal variances assumed	.313	.579	-1.885	40	.067	-1.59	.842	-3.291	.115
	Equal variances not assumed			-1.861	36.164	.071	-1.59	.853	-3.318	.142
Attractive	Equal variances assumed	.188	.667	-1.586	39	.121	-1.36	.860	-3.105	.375
	Equal variances not assumed			-1.591	37.067	.120	-1.36	.858	-3.102	.373
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	1.618	.211	.825	39	.414	.84	1.013	-1.213	2.884
	Equal variances not assumed			.796	30.594	.432	.84	1.049	-1.306	2.977
Reduces carbon emissions	Equal variances assumed	.187	.668	.350	41	.728	.30	.864	-1.444	2.048
	Equal variances not assumed			.351	40.701	.727	.30	.861	-1.437	2.041
Reduces pollution	Equal variances assumed	.860	.359	.922	41	.362	.43	.465	-.510	1.367
	Equal variances not assumed			.907	36.057	.371	.43	.472	-.530	1.386
Clean	Equal variances assumed	.529	.471	-.160	41	.874	-.11	.668	-1.455	1.242
	Equal variances not assumed			-.165	36.751	.870	-.11	.646	-1.415	1.202
Generates savings	Equal variances assumed	.234	.631	-.922	40	.362	-1.16	1.264	-3.719	1.390
	Equal variances not assumed			-.925	39.015	.361	-1.16	1.259	-3.712	1.382
Acts all of the time	Equal variances assumed	.593	.446	-1.197	41	.238	-1.30	1.090	-3.505	.896
	Equal variances not assumed			-1.207	40.983	.234	-1.30	1.080	-3.486	.877
Natural	Equal variances assumed	1.115	.297	-.192	41	.848	-.25	1.311	-2.900	2.396
	Equal variances not assumed			-.194	40.995	.847	-.25	1.299	-2.875	2.371
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.026	.873	-.187	40	.852	-.15	.826	-1.823	1.514
	Equal variances not assumed			-.187	38.864	.853	-.15	.829	-1.831	1.522
Home Improvement	Equal variances assumed	5.457	.024	-1.098	41	.278	-.87	.794	-2.475	.731
	Equal variances not assumed			-1.140	35.330	.262	-.87	.764	-2.423	.680
affordable technology	Equal variances assumed	.133	.717	-.730	39	.470	-.86	1.171	-3.223	1.513
	Equal variances not assumed			-.732	36.877	.469	-.86	1.169	-3.224	1.514
Could develop in the future	Equal variances assumed	1.736	.195	.836	41	.408	.32	.387	-.459	1.106
	Equal variances not assumed			.818	34.447	.419	.32	.396	-.480	1.128
Might help sell a house any faster	Equal variances assumed	.804	.375	-2.553	41	.015	-2.15	.840	-3.843	-.448
	Equal variances not assumed			-2.620	38.952	.012	-2.15	.819	-3.802	-.489
Adds value to a property	Equal variances assumed	.794	.378	-1.537	41	.132	-1.35	.879	-3.124	.424
	Equal variances not assumed			-1.554	40.989	.128	-1.35	.869	-3.104	.404
Provides a visual statement of beliefs	Equal variances assumed	.068	.796	-.235	41	.815	-.24	1.017	-2.293	1.814
	Equal variances not assumed			-.234	39.010	.816	-.24	1.023	-2.308	1.830
Will be more widespread in the future	Equal variances assumed	.183	.671	-.312	41	.757	-.13	.418	-.974	.714
	Equal variances not assumed			-.312	40.022	.757	-.13	.418	-.976	.715
Solar power is compatible with modern living	Equal variances assumed	1.144	.291	-.601	41	.551	-.27	.456	-1.194	.647
	Equal variances not assumed			-.607	41.000	.547	-.27	.451	-1.185	.637
Simple to install in a property	Equal variances assumed	.062	.804	1.039	39	.305	1.12	1.076	-1.059	3.296
	Equal variances not assumed			1.040	36.814	.305	1.12	1.075	-1.061	3.297
safe form of power generation	Equal variances assumed	2.216	.144	1.261	41	.214	.46	.364	-.276	1.193
	Equal variances not assumed			1.238	35.383	.224	.46	.371	-.293	1.211
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	1.134	.293	-.653	41	.518	-.75	1.156	-3.088	1.580
	Equal variances not assumed			-.660	40.994	.513	-.75	1.143	-3.063	1.554

Table 66. Comparison of Means (electricity vs gas as primary fuel type)

Group Statistics

	Primary fuel type	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Electricity	5	9.40	3.847	1.720
	Mains Gas	20	11.30	1.750	.391
There is a high level of grant	Electricity	5	7.60	4.336	1.939
	Mains Gas	20	7.00	3.277	.733
Solar systems are an appreciating asset	Electricity	5	2.60	2.608	1.166
	Mains Gas	21	5.48	2.522	.550
The systems are hidden away	Electricity	5	6.00	3.873	1.732
	Mains Gas	20	4.75	2.900	.648
Attractive	Electricity	5	5.40	1.673	.748
	Mains Gas	19	6.21	2.371	.544
Solar systems needs less maintenance than	Electricity	5	4.00	3.000	1.342
	Mains Gas	19	6.00	3.727	.855
Reduces carbon emissions	Electricity	5	1.60	.894	.400
	Mains Gas	21	2.24	2.406	.525
Reduces pollution	Electricity	5	1.60	.894	.400
	Mains Gas	21	1.90	1.700	.371
Clean	Electricity	5	1.60	.894	.400
	Mains Gas	21	2.00	1.703	.372
Generates savings	Electricity	5	1.80	1.095	.490
	Mains Gas	20	4.05	3.379	.756
Acts all of the time	Electricity	5	4.00	2.000	.894
	Mains Gas	21	3.76	2.998	.654
Natural	Electricity	5	5.60	4.669	2.088
	Mains Gas	21	4.52	3.970	.866
Solar systems provide a comprehensive solution	Electricity	5	2.40	1.342	.600
	Mains Gas	21	4.95	2.747	.600
Home Improvement	Electricity	5	1.60	.894	.400
	Mains Gas	21	3.29	2.261	.493
affordable technology	Electricity	5	2.40	.894	.400
	Mains Gas	19	6.32	3.652	.838
Could develop in the future	Electricity	5	2.00	1.414	.632
	Mains Gas	21	2.05	1.465	.320
Might help sell a house any faster	Electricity	5	2.80	1.095	.490
	Mains Gas	21	5.57	3.010	.657
Adds value to a property	Electricity	5	3.00	1.414	.632
	Mains Gas	21	5.57	3.140	.685
Provides a visual statement of beliefs	Electricity	5	6.40	3.847	1.720
	Mains Gas	21	4.43	2.942	.642
Will be more widespread in the future	Electricity	5	2.20	1.095	.490
	Mains Gas	21	2.19	1.504	.328
Solar power is compatible with modern living	Electricity	5	1.80	1.095	.490
	Mains Gas	21	1.90	1.446	.316
Simple to install in a property	Electricity	5	4.40	3.847	1.720
	Mains Gas	19	5.63	3.435	.788
safe form of power generation	Electricity	5	1.20	.447	.200
	Mains Gas	21	1.81	1.436	.313
The positioning of solar panels does not affect the	Electricity	5	4.60	4.827	2.159
	Mains Gas	21	4.86	3.005	.656

Table 67. Equality of Variances and Means (Electricity vs. Gas as primary fuel type)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	3.879	.061	-1.682	23	.106	-1.90	1.130	-4.237	.437
	Equal variances not assumed			-1.077	4.422	.337	-1.90	1.764	-6.620	2.820
There is a high level of grant	Equal variances assumed	1.658	.211	.344	23	.734	.60	1.742	-3.004	4.204
	Equal variances not assumed			.289	5.201	.783	.60	2.073	-4.667	5.867
Solar systems are an appreciating asset	Equal variances assumed	.020	.888	-2.279	24	.032	-2.88	1.262	-5.481	-.271
	Equal variances not assumed			-2.230	5.922	.068	-2.88	1.290	-6.042	.289
The systems are hidden away	Equal variances assumed	1.085	.308	.809	23	.427	1.25	1.546	-1.947	4.447
	Equal variances not assumed			.676	5.178	.528	1.25	1.849	-3.455	5.955
Attractive	Equal variances assumed	.382	.543	-.714	22	.483	-.81	1.136	-3.166	1.545
	Equal variances not assumed			-.876	8.796	.404	-.81	.925	-2.911	1.290
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	1.526	.230	-1.104	22	.282	-2.00	1.812	-5.758	1.758
	Equal variances not assumed			-1.257	7.629	.246	-2.00	1.591	-5.700	1.700
Reduces carbon emissions	Equal variances assumed	1.649	.211	-.576	24	.570	-.64	1.108	-2.925	1.649
	Equal variances not assumed			-.967	18.612	.346	-.64	.660	-2.022	.745
Reduces pollution	Equal variances assumed	.823	.373	-.384	24	.704	-.30	.793	-1.942	1.333
	Equal variances not assumed			-.559	12.058	.587	-.30	.546	-1.493	.883
Clean	Equal variances assumed	.985	.331	-.503	24	.619	-.40	.795	-2.040	1.240
	Equal variances not assumed			-.733	12.084	.478	-.40	.546	-1.589	.789
Generates savings	Equal variances assumed	4.601	.043	-1.449	23	.161	-2.25	1.553	-5.462	.962
	Equal variances not assumed			-2.499	20.839	.021	-2.25	.901	-4.124	-.376
Acts all of the time	Equal variances assumed	1.989	.171	.168	24	.868	.24	1.421	-2.695	3.172
	Equal variances not assumed			.215	8.916	.835	.24	1.108	-2.272	2.749
Natural	Equal variances assumed	.073	.789	.528	24	.602	1.08	2.038	-3.129	5.282
	Equal variances not assumed			.476	5.463	.652	1.08	2.261	-4.590	6.742
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	1.844	.187	-1.998	24	.057	-2.55	1.277	-5.189	.084
	Equal variances not assumed			-3.009	13.319	.010	-2.55	.848	-4.380	-.724
Home Improvement	Equal variances assumed	4.499	.044	-1.616	24	.119	-1.69	1.043	-3.839	.467
	Equal variances not assumed			-2.654	17.387	.016	-1.69	.635	-3.024	-.348
affordable technology	Equal variances assumed	3.992	.058	-2.343	22	.029	-3.92	1.672	-7.382	-.449
	Equal variances not assumed			-4.217	21.998	.000	-3.92	.928	-5.841	-1.990
Could develop in the future	Equal variances assumed	.000	.986	-.066	24	.948	-.05	.725	-1.544	1.449
	Equal variances not assumed			-.067	6.225	.949	-.05	.709	-1.767	1.671
Might help sell a house any faster	Equal variances assumed	4.487	.045	-2.001	24	.057	-2.77	1.385	-5.630	.087
	Equal variances not assumed			-3.383	19.014	.003	-2.77	.819	-4.486	-1.057
Adds value to a property	Equal variances assumed	3.592	.070	-1.768	24	.090	-2.57	1.455	-5.574	.431
	Equal variances not assumed			-2.758	14.816	.015	-2.57	.932	-4.561	-.582
Provides a visual statement of beliefs	Equal variances assumed	1.039	.318	1.273	24	.215	1.97	1.548	-1.224	5.167
	Equal variances not assumed			1.074	5.172	.331	1.97	1.836	-2.702	6.645
Will be more widespread in the future	Equal variances assumed	.936	.343	.013	24	.990	.01	.719	-1.473	1.492
	Equal variances not assumed			.016	8.071	.988	.01	.590	-1.348	1.367
Solar power is compatible with modern living	Equal variances assumed	.159	.694	-.151	24	.881	-.10	.693	-1.536	1.326
	Equal variances not assumed			-.180	7.740	.862	-.10	.583	-1.456	1.247
Simple to install in a property	Equal variances assumed	.149	.704	-.697	22	.493	-1.23	1.766	-4.894	2.431
	Equal variances not assumed			-.651	5.798	.540	-1.23	1.892	-5.901	3.438
safe form of power generation	Equal variances assumed	3.276	.083	-.926	24	.364	-.61	.659	-1.969	.750
	Equal variances not assumed			-1.640	21.649	.116	-.61	.372	-1.381	.162
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.999	.328	-.153	24	.880	-.26	1.681	-3.726	3.212
	Equal variances not assumed			-.114	4.764	.914	-.26	2.256	-6.144	5.630

Table 68. Comparison of means of attitudes of respondents with CW insulation vs. those without.

Group Statistics

	cavity wall insulation	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Yes	25	10.76	2.587	.517
	No	16	11.06	2.407	.602
There is a high level of grant	Yes	25	6.88	3.678	.736
	No	16	8.06	3.151	.788
Solar systems are an appreciating asset	Yes	23	4.26	2.750	.574
	No	17	5.94	2.277	.552
The systems are hidden away	Yes	25	5.72	2.792	.558
	No	16	4.44	2.804	.701
Attractive	Yes	25	6.40	2.799	.560
	No	15	6.67	2.944	.760
Solar systems needs less maintenance than	Yes	25	4.72	3.089	.618
	No	15	5.47	3.543	.915
Reduces carbon emissions	Yes	25	2.40	3.082	.616
	No	17	2.65	2.499	.606
Reduces pollution	Yes	25	1.68	1.464	.293
	No	17	1.76	1.678	.407
Clean	Yes	25	1.44	.961	.192
	No	17	2.59	3.163	.767
Generates savings	Yes	25	4.52	4.501	.900
	No	16	5.00	3.559	.890
Acts all of the time	Yes	25	4.80	3.416	.683
	No	17	4.59	4.017	.974
Natural	Yes	25	4.68	4.543	.909
	No	17	4.35	4.015	.974
Solar systems provide a comprehensive solution	Yes	24	3.96	2.662	.543
	No	17	5.00	2.646	.642
Home Improvement	Yes	25	3.20	2.887	.577
	No	17	2.94	2.277	.552
affordable technology	Yes	25	5.00	3.175	.635
	No	15	8.20	3.821	.987
Could develop in the future	Yes	25	1.76	1.052	.210
	No	17	2.29	1.532	.371
Might help sell a house any faster	Yes	25	5.48	2.988	.598
	No	17	6.12	2.934	.712
Adds value to a property	Yes	25	5.00	2.858	.572
	No	17	6.00	3.062	.743
Provides a visual statement of beliefs	Yes	25	4.84	3.460	.692
	No	17	4.35	3.200	.776
Will be more widespread in the future	Yes	25	2.04	1.241	.248
	No	17	2.12	1.576	.382
Solar power is compatible with modern living	Yes	25	2.12	1.590	.318
	No	17	1.82	1.286	.312
Simple to install in a property	Yes	25	5.36	3.328	.666
	No	15	5.33	3.792	.979
safe form of power generation	Yes	25	1.48	1.122	.224
	No	17	1.65	1.222	.296
The positioning of solar panels does not affect the	Yes	25	5.08	4.092	.818
	No	17	4.35	2.893	.702

Table 69. Equality of Means and variances of those with CW insulation and those without

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.093	.762	-.375	39	.710	-.30	.807	-1.934	1.329
	Equal variances not assumed			-.381	33.815	.705	-.30	.794	-1.916	1.311
There is a high level of grant	Equal variances assumed	.110	.742	-1.060	39	.296	-1.18	1.116	-3.439	1.074
	Equal variances not assumed			-1.097	35.631	.280	-1.18	1.078	-3.369	1.004
Solar systems are an appreciating asset	Equal variances assumed	1.597	.214	-2.051	38	.047	-1.68	.819	-3.339	-.022
	Equal variances not assumed			-2.111	37.447	.042	-1.68	.796	-3.293	-.068
The systems are hidden away	Equal variances assumed	.077	.783	1.432	39	.160	1.28	.895	-.528	3.093
	Equal variances not assumed			1.431	32.015	.162	1.28	.896	-.543	3.108
Attractive	Equal variances assumed	.003	.955	-.286	38	.776	-.27	.932	-2.153	1.620
	Equal variances not assumed			-.282	28.425	.780	-.27	.944	-2.199	1.666
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.444	.509	-.700	38	.488	-.75	1.066	-2.905	1.411
	Equal variances not assumed			-.676	26.473	.505	-.75	1.104	-3.014	1.520
Reduces carbon emissions	Equal variances assumed	.000	.982	-.274	40	.785	-.25	.900	-2.066	1.572
	Equal variances not assumed			-.286	38.653	.777	-.25	.864	-1.996	1.502
Reduces pollution	Equal variances assumed	.077	.782	-.173	40	.863	-.08	.488	-1.072	.902
	Equal variances not assumed			-.169	31.264	.867	-.08	.501	-1.107	.938
Clean	Equal variances assumed	8.195	.007	-1.711	40	.095	-1.15	.671	-2.505	.208
	Equal variances not assumed			-1.452	18.023	.164	-1.15	.791	-2.810	.513
Generates savings	Equal variances assumed	.864	.358	-.360	39	.721	-.48	1.333	-3.177	2.217
	Equal variances not assumed			-.379	37.118	.707	-.48	1.266	-3.044	2.084
Acts all of the time	Equal variances assumed	.598	.444	.184	40	.855	.21	1.153	-2.119	2.542
	Equal variances not assumed			.178	30.662	.860	.21	1.190	-2.216	2.639
Natural	Equal variances assumed	.763	.388	.240	40	.812	.33	1.364	-2.430	3.084
	Equal variances not assumed			.246	37.197	.807	.33	1.332	-2.371	3.025
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.001	.976	-1.238	39	.223	-1.04	.842	-2.744	.661
	Equal variances not assumed			-1.239	34.743	.224	-1.04	.841	-2.749	.666
Home Improvement	Equal variances assumed	.300	.587	.310	40	.758	.26	.836	-1.431	1.949
	Equal variances not assumed			.324	39.017	.748	.26	.799	-1.357	1.875
affordable technology	Equal variances assumed	1.099	.301	-2.859	38	.007	-3.20	1.119	-5.466	-.934
	Equal variances not assumed			-2.727	25.457	.011	-3.20	1.173	-5.614	-.786
Could develop in the future	Equal variances assumed	3.766	.059	-1.342	40	.187	-.53	.398	-1.338	.270
	Equal variances not assumed			-1.251	26.121	.222	-.53	.427	-1.411	.343
Might help sell a house any faster	Equal variances assumed	.822	.370	-.684	40	.498	-.64	.933	-2.522	1.247
	Equal variances not assumed			-.686	34.936	.497	-.64	.929	-2.524	1.249
Adds value to a property	Equal variances assumed	.085	.772	-1.082	40	.286	-1.00	.925	-2.869	.869
	Equal variances not assumed			-1.067	32.878	.294	-1.00	.937	-2.907	.907
Provides a visual statement of beliefs	Equal variances assumed	.109	.743	.461	40	.647	.49	1.056	-1.647	2.621
	Equal variances not assumed			.468	36.269	.642	.49	1.040	-1.621	2.596
Will be more widespread in the future	Equal variances assumed	1.370	.249	-.178	40	.859	-.08	.435	-.958	.802
	Equal variances not assumed			-.170	28.903	.866	-.08	.456	-1.010	.855
Solar power is compatible with modern living	Equal variances assumed	.719	.402	.639	40	.526	.30	.464	-.641	1.234
	Equal variances not assumed			.666	38.679	.510	.30	.445	-.605	1.198
Simple to install in a property	Equal variances assumed	.452	.506	.023	38	.982	.03	1.145	-2.291	2.345
	Equal variances not assumed			.023	26.611	.982	.03	1.184	-2.404	2.458
safe form of power generation	Equal variances assumed	.514	.478	-.457	40	.650	-.17	.366	-.906	.572
	Equal variances not assumed			-.449	32.501	.656	-.17	.372	-.924	.590
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	3.754	.060	.632	40	.531	.73	1.150	-1.598	3.052
	Equal variances not assumed			.674	39.907	.504	.73	1.078	-1.452	2.906

Table 70. Comparison of means of attitudes of respondents with Energy Eff. Boilers vs. those without

Group Statistics

	energy efficient boiler	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Yes	16	10.75	2.113	.528
	No	25	10.96	2.746	.549
There is a high level of grant	Yes	16	7.50	3.327	.832
	No	25	7.24	3.655	.731
Solar systems are an appreciating asset	Yes	16	5.13	2.500	.625
	No	24	4.88	2.818	.575
The systems are hidden away	Yes	16	4.94	2.909	.727
	No	25	5.40	2.828	.566
Attractive	Yes	16	6.19	2.316	.579
	No	24	6.71	3.141	.641
Solar systems needs less maintenance than	Yes	16	4.75	3.821	.955
	No	24	5.17	2.869	.586
Reduces carbon emissions	Yes	16	2.19	2.639	.660
	No	26	2.69	2.977	.584
Reduces pollution	Yes	16	1.38	1.025	.256
	No	26	1.92	1.765	.346
Clean	Yes	16	1.25	.577	.144
	No	26	2.31	2.680	.526
Generates savings	Yes	16	4.25	4.139	1.035
	No	25	5.00	4.163	.833
Acts all of the time	Yes	16	4.94	3.890	.972
	No	26	4.58	3.523	.691
Natural	Yes	16	4.94	4.219	1.055
	No	26	4.31	4.398	.862
Solar systems provide a comprehensive solution	Yes	16	4.31	2.469	.617
	No	25	4.44	2.844	.569
Home Improvement	Yes	16	2.50	1.751	.438
	No	26	3.46	3.023	.593
affordable technology	Yes	16	5.50	3.882	.970
	No	24	6.67	3.632	.741
Could develop in the future	Yes	16	1.81	1.223	.306
	No	26	2.08	1.324	.260
Might help sell a house any faster	Yes	16	5.63	3.181	.795
	No	26	5.81	2.857	.560
Adds value to a property	Yes	16	5.50	2.658	.665
	No	26	5.35	3.162	.620
Provides a visual statement of beliefs	Yes	16	4.50	3.559	.890
	No	26	4.73	3.244	.636
Will be more widespread in the future	Yes	16	2.25	1.483	.371
	No	26	1.96	1.311	.257
Solar power is compatible with modern living	Yes	16	1.75	1.183	.296
	No	26	2.15	1.617	.317
Simple to install in a property	Yes	16	5.63	3.757	.939
	No	24	5.17	3.319	.677
safe form of power generation	Yes	16	1.50	1.095	.274
	No	26	1.58	1.206	.236
The positioning of solar panels does not affect the	Yes	16	5.25	4.328	1.082
	No	26	4.50	3.191	.626

Table 71. Equality of Means and Variances of those with EE Boilers vs. those without.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.843	.364	-.260	39	.796	-.21	.807	-1.843	1.423
	Equal variances not assumed			-.276	37.536	.784	-.21	.762	-1.753	1.333
There is a high level of grant	Equal variances assumed	.251	.619	.230	39	.819	.26	1.131	-2.027	2.547
	Equal variances not assumed			.235	34.323	.816	.26	1.107	-1.989	2.509
Solar systems are an appreciating asset	Equal variances assumed	.769	.386	.287	38	.776	.25	.870	-1.512	2.012
	Equal variances not assumed			.294	34.860	.770	.25	.849	-1.475	1.975
The systems are hidden away	Equal variances assumed	.013	.909	-.505	39	.616	-.46	.916	-2.314	1.389
	Equal variances not assumed			-.502	31.447	.619	-.46	.921	-2.341	1.416
Attractive	Equal variances assumed	.497	.485	-.567	38	.574	-.52	.918	-2.379	1.337
	Equal variances not assumed			-.603	37.536	.550	-.52	.864	-2.270	1.229
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	1.066	.308	-.394	38	.696	-.42	1.058	-2.558	1.725
	Equal variances not assumed			-.372	26.000	.713	-.42	1.120	-2.720	1.887
Reduces carbon emissions	Equal variances assumed	.238	.629	-.557	40	.581	-.50	.907	-2.338	1.328
	Equal variances not assumed			-.573	34.866	.570	-.50	.881	-2.293	1.284
Reduces pollution	Equal variances assumed	2.844	.099	-1.128	40	.266	-.55	.486	-1.530	.434
	Equal variances not assumed			-1.273	39.925	.210	-.55	.431	-1.418	.322
Clean	Equal variances assumed	6.273	.016	-1.550	40	.129	-1.06	.682	-2.437	.322
	Equal variances not assumed			-1.941	28.642	.062	-1.06	.545	-2.173	.058
Generates savings	Equal variances assumed	.087	.769	-.564	39	.576	-.75	1.330	-3.440	1.940
	Equal variances not assumed			-.565	32.260	.576	-.75	1.328	-3.455	1.955
Acts all of the time	Equal variances assumed	.692	.410	.310	40	.758	.36	1.165	-1.993	2.714
	Equal variances not assumed			.302	29.465	.765	.36	1.193	-2.078	2.799
Natural	Equal variances assumed	.024	.878	.458	40	.650	.63	1.376	-2.152	3.411
	Equal variances not assumed			.462	32.935	.647	.63	1.362	-2.142	3.402
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.228	.635	-.147	39	.884	-.13	.866	-1.880	1.625
	Equal variances not assumed			-.152	35.359	.880	-.13	.839	-1.831	1.576
Home Improvement	Equal variances assumed	4.617	.038	-1.155	40	.255	-.96	.832	-2.644	.721
	Equal variances not assumed			-1.305	39.917	.199	-.96	.737	-2.451	.528
affordable technology	Equal variances assumed	.005	.947	-.969	38	.339	-1.17	1.205	-3.605	1.272
	Equal variances not assumed			-.955	30.779	.347	-1.17	1.221	-3.658	1.325
Could develop in the future	Equal variances assumed	.156	.695	-.646	40	.522	-.26	.409	-1.091	.562
	Equal variances not assumed			-.659	33.874	.514	-.26	.401	-1.080	.551
Might help sell a house any faster	Equal variances assumed	.213	.647	-.193	40	.848	-.18	.948	-2.098	1.733
	Equal variances not assumed			-.188	29.263	.852	-.18	.973	-2.171	1.806
Adds value to a property	Equal variances assumed	.712	.404	.162	40	.872	.15	.948	-1.762	2.069
	Equal variances not assumed			.169	36.077	.867	.15	.909	-1.689	1.997
Provides a visual statement of beliefs	Equal variances assumed	.481	.492	-.216	40	.830	-.23	1.069	-2.392	1.931
	Equal variances not assumed			-.211	29.615	.834	-.23	1.094	-2.466	2.004
Will be more widespread in the future	Equal variances assumed	.661	.421	.659	40	.514	.29	.438	-.597	1.173
	Equal variances not assumed			.639	28.882	.528	.29	.451	-.635	1.211
Solar power is compatible with modern living	Equal variances assumed	2.810	.102	-.865	40	.392	-.40	.467	-1.348	.540
	Equal variances not assumed			-.931	38.658	.358	-.40	.434	-1.281	.474
Simple to install in a property	Equal variances assumed	.256	.615	.406	38	.687	.46	1.129	-1.827	2.744
	Equal variances not assumed			.396	29.464	.695	.46	1.158	-1.909	2.825
safe form of power generation	Equal variances assumed	.128	.722	-.208	40	.837	-.08	.370	-.825	.672
	Equal variances not assumed			-.213	34.274	.833	-.08	.362	-.812	.658
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	2.511	.121	.645	40	.523	.75	1.163	-1.600	3.100
	Equal variances not assumed			.600	25.030	.554	.75	1.250	-1.824	3.324

Table 72. Comparison of means (those with double glazing vs. those without)

Group Statistics

	Double Glazing	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Yes	33	10.91	2.416	.421
	No	8	10.75	2.964	1.048
There is a high level of grant	Yes	33	7.12	3.343	.582
	No	8	8.25	4.166	1.473
Solar systems are an appreciating asset	Yes	31	4.94	2.756	.495
	No	9	5.11	2.472	.824
The systems are hidden away	Yes	33	5.42	2.829	.492
	No	8	4.38	2.875	1.017
Attractive	Yes	32	6.56	2.687	.475
	No	8	6.25	3.495	1.236
Solar systems needs less maintenance than	Yes	32	4.88	3.160	.559
	No	8	5.50	3.742	1.323
Reduces carbon emissions	Yes	33	2.06	2.715	.473
	No	9	4.11	2.804	.935
Reduces pollution	Yes	33	1.55	1.301	.227
	No	9	2.33	2.179	.726
Clean	Yes	33	1.42	.902	.157
	No	9	3.67	4.093	1.364
Generates savings	Yes	32	4.69	4.115	.727
	No	9	4.78	4.381	1.460
Acts all of the time	Yes	33	4.48	3.633	.632
	No	9	5.56	3.678	1.226
Natural	Yes	33	4.27	4.155	.723
	No	9	5.56	4.876	1.625
Solar systems provide a comprehensive solution	Yes	32	4.13	2.550	.451
	No	9	5.33	3.041	1.014
Home Improvement	Yes	33	3.33	2.836	.494
	No	9	2.22	1.481	.494
affordable technology	Yes	32	6.06	3.360	.594
	No	8	6.75	5.203	1.840
Could develop in the future	Yes	33	2.00	1.275	.222
	No	9	1.89	1.364	.455
Might help sell a house any faster	Yes	33	5.73	2.842	.495
	No	9	5.78	3.492	1.164
Adds value to a property	Yes	33	5.48	2.980	.519
	No	9	5.11	2.977	.992
Provides a visual statement of beliefs	Yes	33	4.55	3.251	.566
	No	9	5.00	3.775	1.258
Will be more widespread in the future	Yes	33	2.15	1.372	.239
	No	9	1.78	1.394	.465
Solar power is compatible with modern living	Yes	33	2.06	1.499	.261
	No	9	1.78	1.394	.465
Simple to install in a property	Yes	32	5.19	3.217	.569
	No	8	6.00	4.504	1.592
safe form of power generation	Yes	33	1.55	1.121	.195
	No	9	1.56	1.333	.444
The positioning of solar panels does not affect the	Yes	33	4.88	3.740	.651
	No	9	4.44	3.395	1.132

Table 73. Equality of Means and Variances (those with Double Glazing vs. those without)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	1.618	.211	.160	39	.874	.16	.994	-1.852	2.170
	Equal variances not assumed			.141	9.382	.891	.16	1.129	-2.380	2.698
There is a high level of grant	Equal variances assumed	.797	.377	-.817	39	.419	-1.13	1.381	-3.922	1.665
	Equal variances not assumed			-.713	9.305	.493	-1.13	1.584	-4.694	2.436
Solar systems are an appreciating asset	Equal variances assumed	.104	.749	-.172	38	.864	-.18	1.022	-2.244	1.893
	Equal variances not assumed			-.183	14.318	.858	-.18	.961	-2.233	1.882
The systems are hidden away	Equal variances assumed	.214	.646	.938	39	.354	1.05	1.118	-1.212	3.311
	Equal variances not assumed			.929	10.543	.374	1.05	1.130	-1.450	3.549
Attractive	Equal variances assumed	.535	.469	.277	38	.783	.31	1.128	-1.971	2.596
	Equal variances not assumed			.236	9.177	.819	.31	1.324	-2.673	3.298
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.591	.447	-.483	38	.632	-.63	1.294	-3.245	1.995
	Equal variances not assumed			-.435	9.649	.673	-.63	1.436	-3.840	2.590
Reduces carbon emissions	Equal variances assumed	1.039	.314	-1.995	40	.053	-2.05	1.028	-4.128	.027
	Equal variances not assumed			-1.958	12.412	.073	-2.05	1.047	-4.324	.223
Reduces pollution	Equal variances assumed	3.989	.053	-1.380	40	.175	-.79	.571	-1.942	.366
	Equal variances not assumed			-1.035	9.608	.326	-.79	.761	-2.493	.917
Clean	Equal variances assumed	29.054	.000	-2.981	40	.005	-2.24	.752	-3.763	-.722
	Equal variances not assumed			-1.633	8.213	.140	-2.24	1.373	-5.395	.910
Generates savings	Equal variances assumed	.206	.653	-.057	39	.955	-.09	1.574	-3.273	3.093
	Equal variances not assumed			-.055	12.267	.957	-.09	1.632	-3.636	3.456
Acts all of the time	Equal variances assumed	.056	.814	-.782	40	.439	-1.07	1.369	-3.838	1.697
	Equal variances not assumed			-.776	12.600	.452	-1.07	1.379	-4.061	1.919
Natural	Equal variances assumed	.411	.525	-.792	40	.433	-1.28	1.620	-4.558	1.992
	Equal variances not assumed			-.721	11.371	.485	-1.28	1.779	-5.183	2.617
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.339	.564	-1.205	39	.235	-1.21	1.003	-3.237	.820
	Equal variances not assumed			-1.089	11.360	.299	-1.21	1.109	-3.641	1.224
Home Improvement	Equal variances assumed	2.861	.099	1.127	40	.266	1.11	.986	-.881	3.104
	Equal variances not assumed			1.591	25.591	.124	1.11	.698	-.325	2.547
affordable technology	Equal variances assumed	4.022	.052	-.462	38	.647	-.69	1.489	-3.702	2.327
	Equal variances not assumed			-.356	8.514	.731	-.69	1.933	-5.099	3.724
Could develop in the future	Equal variances assumed	.160	.691	.228	40	.820	.11	.486	-.872	1.094
	Equal variances not assumed			.220	12.092	.830	.11	.506	-.990	1.213
Might help sell a house any faster	Equal variances assumed	.022	.883	-.045	40	.964	-.05	1.122	-2.318	2.217
	Equal variances not assumed			-.040	11.062	.969	-.05	1.265	-2.832	2.731
Adds value to a property	Equal variances assumed	.156	.695	.334	40	.740	.37	1.120	-1.891	2.638
	Equal variances not assumed			.334	12.734	.744	.37	1.120	-2.050	2.798
Provides a visual statement of beliefs	Equal variances assumed	.746	.393	-.360	40	.721	-.45	1.264	-3.010	2.101
	Equal variances not assumed			-.329	11.446	.748	-.45	1.380	-3.477	2.568
Will be more widespread in the future	Equal variances assumed	.437	.512	.722	40	.475	.37	.518	-.672	1.420
	Equal variances not assumed			.715	12.564	.488	.37	.523	-.759	1.507
Solar power is compatible with modern living	Equal variances assumed	.390	.536	.509	40	.614	.28	.556	-.841	1.407
	Equal variances not assumed			.531	13.500	.604	.28	.533	-.864	1.430
Simple to install in a property	Equal variances assumed	1.222	.276	-.589	38	.559	-.81	1.380	-3.605	1.980
	Equal variances not assumed			-.481	8.867	.642	-.81	1.691	-4.646	3.021
safe form of power generation	Equal variances assumed	.053	.820	-.023	40	.982	-.01	.439	-.896	.876
	Equal variances not assumed			-.021	11.274	.984	-.01	.485	-1.075	1.055
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.008	.931	.314	40	.755	.43	1.381	-2.357	3.226
	Equal variances not assumed			.333	13.792	.744	.43	1.306	-2.370	3.239

12.3 Comparison of Means (Non-parametric Tests)

Table 74. Mann-Whitney U test (Adoption statements vs Gender)

Ranks

	Gender	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Male	27	19.41	524.00
	Female	11	19.73	217.00
	Total	38		
Only if it works with what I have	Male	26	20.19	525.00
	Female	10	14.10	141.00
	Total	36		
Too complex, likely to discourage	Male	26	20.00	520.00
	Female	10	14.60	146.00
	Total	36		
Not seen before, less likely to buy	Male	25	19.20	480.00
	Female	10	15.00	150.00
	Total	35		
Try it first, more likely to buy	Male	26	18.85	490.00
	Female	10	17.60	176.00
	Total	36		
Knowing a product fits with my lifestyle is more important than trying it first	Male	26	20.60	535.50
	Female	11	15.23	167.50
	Total	37		

Test Statistics[b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	146.000	86.000	91.000	95.000	121.000	101.500
Wilcoxon W	524.000	141.000	146.000	150.000	176.000	167.500
Z	-.172	-1.805	-1.612	-1.506	-.424	-1.606
Asymp. Sig. (2-tailed)	.863	.071	.107	.132	.672	.108
Exact Sig. [2*(1-tailed Sig.)]	.949[a]	.126[a]	.177[a]	.287[a]	.768[a]	.170[a]

a. Not corrected for ties.

b. Grouping Variable: Gender

Table 75. Mann-Whitney U test (Adoption Statements vs. Location)

Ranks

	House location	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Urban	20	21.58	431.50
	Rural	23	22.37	514.50
	Total	43		
Only if it works with what I have	Urban	19	19.55	371.50
	Rural	22	22.25	489.50
	Total	41		
Too complex, likely to discourage	Urban	19	18.55	352.50
	Rural	22	23.11	508.50
	Total	41		
Not seen before, less likely to buy	Urban	18	22.78	410.00
	Rural	22	18.64	410.00
	Total	40		
Try it first, more likely to buy	Urban	19	23.05	438.00
	Rural	22	19.23	423.00
	Total	41		
Knowing a product fits with my lifestyle is more important than trying it first	Urban	19	19.45	369.50
	Rural	23	23.20	533.50
	Total	42		

Test Statistics[b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	221.500	181.500	162.500	157.000	170.000	179.500
Wilcoxon W	431.500	371.500	352.500	410.000	423.000	369.500
Z	-.469	-.836	-1.404	-1.541	-1.328	-1.149
Asymp. Sig. (2-tailed)	.639	.403	.160	.123	.184	.250
Exact Sig. [2*(1-tailed Sig.)]				.274[a]		

a. Not corrected for ties.

b. Grouping Variable: House location

Table 76. Kruskall Wallis Test (Adoption Statements vs. Age)

Ranks

	Age	N	Mean Rank
Advantage and Benefits most important	18-35	4	25.88
	36-50	19	21.63
	51-65	13	22.15
	66+	7	20.50
	Total	43	
Only if it works with what I have	18-35	4	27.38
	36-50	18	21.11
	51-65	12	17.13
	66+	7	23.71
	Total	41	
Too complex, likely to discourage	18-35	4	16.13
	36-50	18	24.67
	51-65	12	17.83
	66+	7	19.79
	Total	41	
Not seen before, less likely to buy	18-35	4	20.00
	36-50	17	20.29
	51-65	12	21.67
	66+	7	19.29
	Total	40	
Try it first, more likely to buy	18-35	4	25.75
	36-50	18	18.92
	51-65	12	20.63
	66+	7	24.29
	Total	41	
Knowing a product fits with my lifestyle is more important than trying it first	18-35	4	14.75
	36-50	18	22.33
	51-65	13	24.04
	66+	7	18.50
	Total	42	

Test Statistics[a,b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Chi-Square	2.562	3.719	4.346	.397	2.905	3.087
df	3	3	3	3	3	3
Asymp. Sig.	.464	.293	.226	.941	.407	.378

a. Kruskal Wallis Test

b. Grouping Variable: Age

Table 77. Kruskall Wallis Test (Adoption Statements vs. Occupation)

Ranks

	Occupation	N	Mean Rank
Advantage and Benefits most important	Retired	15	20.00
	Senior management	3	20.00
	Professional	5	24.20
	Semi-skilled	15	21.40
	Not working	4	25.25
	Total	42	
Only if it works with what I have	Retired	14	20.07
	Senior management	3	24.83
	Professional	4	21.50
	Semi-skilled	15	22.17
	Not working	4	11.50
	Total	40	
Too complex, likely to discourage	Retired	14	16.71
	Senior management	3	24.33
	Professional	4	16.00
	Semi-skilled	15	25.67
	Not working	4	16.00
	Total	40	
Not seen before, less likely to buy	Retired	13	21.50
	Senior management	3	18.00
	Professional	4	14.75
	Semi-skilled	15	20.60
	Not working	4	19.63
	Total	39	
Try it first, more likely to buy	Retired	14	20.71
	Senior management	3	28.33
	Professional	4	20.00
	Semi-skilled	15	19.00
	Not working	4	20.00
	Total	40	
Knowing a product fits with my lifestyle is more important than trying it first	Retired	14	21.21
	Senior management	3	23.17
	Professional	5	17.70
	Semi-skilled	15	24.53
	Not working	4	9.50
	Total	41	

Test Statistics[a,b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Chi-Square	4.450	4.221	7.889	2.273	2.695	7.404
df	4	4	4	4	4	4
Asymp. Sig.	.348	.377	.096	.686	.610	.116

a. Kruskal Wallis Test

b. Grouping Variable: Occupation

Table 78. Kruskall Wallis Test (Adoption statements vs. Income)

Ranks

	Total Household income	N	Mean Rank
Advantage and Benefits most important	0-14,999	10	19.35
	15-29,999	14	20.14
	30-49,999	7	17.50
	50,000+	6	17.50
	Total	37	
Only if it works with what I have	0-14,999	9	18.78
	15-29,999	13	19.08
	30-49,999	7	13.50
	50,000+	6	19.75
	Total	35	
Too complex, likely to discourage	0-14,999	9	21.17
	15-29,999	13	18.92
	30-49,999	7	12.00
	50,000+	6	18.25
	Total	35	
Not seen before, less likely to buy	0-14,999	9	19.61
	15-29,999	12	20.08
	30-49,999	7	16.64
	50,000+	6	10.17
	Total	34	
Try it first, more likely to buy	0-14,999	9	15.94
	15-29,999	13	19.38
	30-49,999	7	16.50
	50,000+	6	19.83
	Total	35	
Knowing a product fits with my lifestyle is more important than trying it first	0-14,999	10	20.10
	15-29,999	13	15.81
	30-49,999	7	17.79
	50,000+	6	22.50
	Total	36	

Test Statistics[a,b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Chi-Square	1.861	2.388	4.491	8.362	1.779	2.770
df	3	3	3	3	3	3
Asymp. Sig.	.602	.496	.213	.039	.620	.428

a. Kruskal Wallis Test

b. Grouping Variable: Total Household income

13 Appendix G. Early Majority Survey Response Data

This Appendix contains the detailed response data and results of statistical testing carried out on the responses from the early majority survey.

The appendix contains:

- Descriptive Statistics, including simple classification and cross-tabulation
- Comparison of Means, including comparisons within socio-economic groups of the responses to constructs
- Graphs illustrating responses to constructs per attribute category
- Comparisons of Means for responses to the ‘adoption statements’

For reference purposes, Figure 41 contains a numbered index list of the ‘positive’ constructs. This is for use when referring to the graphs used in this appendix.

13.1 Descriptive Statistics

13.1.1 Socio-economic classification

Table 79. Frequency Table (Gender)

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	212	61.4	63.9	63.9
	Female	120	34.8	36.1	100.0
	Total	332	96.2	100.0	
Missing	Missing	13	3.8		
Total		345	100.0		

Table 80. Frequency Table (Age)

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-35	45	13.0	13.1	13.1
	36-50	99	28.7	28.9	42.0
	51-65	124	35.9	36.2	78.1
	66+	75	21.7	21.9	100.0
	Total	343	99.4	100.0	
Missing	Missing	1	.3		
	System	1	.3		
	Total	2	.6		
Total		345	100.0		

Table 81. Frequency Table (Occupation)

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Retired	120	34.8	38.7	38.7
	Senior management	36	10.4	11.6	50.3
	Professional	54	15.7	17.4	67.7
	Semi-skilled	85	24.6	27.4	95.2
	Not working	15	4.3	4.8	100.0
	Total	310	89.9	100.0	
Missing	Missing	35	10.1		
Total		345	100.0		

Table 82. Frequency Table (Number of People at home)

Number of People at Home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2	180	52.2	61.4	61.4
	3-5	111	32.2	37.9	99.3
	6+	2	.6	.7	100.0
	Total	293	84.9	100.0	
Missing	Missing	52	15.1		
Total		345	100.0		

Table 83. Frequency Table (total household income)

Total Household income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-14,999	74	21.4	23.3	23.3
	15-29,999	107	31.0	33.8	57.1
	30-44,999	95	27.5	30.0	87.1
	45,000+	41	11.9	12.9	100.0
	Total	317	91.9	100.0	
Missing	Missing	28	8.1		
Total		345	100.0		

Table 84. Frequency Table (House Location)

House location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	275	79.7	84.6	84.6
	Rural	50	14.5	15.4	100.0
	Total	325	94.2	100.0	
Missing	Missing	20	5.8		
Total		345	100.0		

Table 85. Frequency Table (Primary Heating Fuel Type)

Primary fuel type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Electricity	18	5.2	5.4	5.4
	Oil	59	17.1	17.7	23.1
	Mains Gas	247	71.6	74.0	97.0
	Bottled Gas	1	.3	.3	97.3
	Solid Fuel	3	.9	.9	98.2
	LPG	6	1.7	1.8	100.0
	Total	334	96.8	100.0	
Missing	Missing	11	3.2		
Total		345	100.0		

Table 86. Frequency Table (Cavity Wall insulation)

cavity wall insulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	275	79.7	80.4	80.4
	No	67	19.4	19.6	100.0
	Total	342	99.1	100.0	
Missing	Missing	3	.9		
Total		345	100.0		

Table 87. Frequency Table (Loft insulation)

loft insulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	341	98.8	99.7	99.7
	No	1	.3	.3	100.0
	Total	342	99.1	100.0	
Missing	Missing	3	.9		
Total		345	100.0		

Table 88. Frequency Table (Energy Efficient Boiler)

energy efficient boiler

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	144	41.7	42.4	42.4
	No	196	56.8	57.6	100.0
	Total	340	98.6	100.0	
Missing	Missing	5	1.4		
Total		345	100.0		

Table 89. Frequency Table (Double Glazing)

Double Glazing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	303	87.8	88.6	88.6
	No	39	11.3	11.4	100.0
	Total	342	99.1	100.0	
Missing	Missing	3	.9		
Total		345	100.0		

13.1.2 Cross-tabulations of the socio-economic profiles

Table 90. Cross-tabulation (Age vs Occupation)

Age * Occupation Crosstabulation

Count

		Occupation					Total
		Retired	Senior management	Professional	Semi-skilled	Not working	
Age	18-35		4	12	22	3	41
	36-50	1	22	24	34	7	88
	51-65	48	10	17	28	4	107
	66+	70		1	1	1	73
Total		119	36	54	85	15	309

Table 91. Cross-tabulation (Age vs Gender)

Age * Gender Crosstabulation

Count

		Gender		Total
		Male	Female	
Age	18-35	25	18	43
	36-50	51	45	96
	51-65	77	41	118
	66+	59	15	74
Total		212	119	331

Table 92. Cross-tabulation (Age vs Total Household income)

Age * Total Household income Crosstabulation

Count

		Total Household income				Total
		0-14,999	15-29,999	30-44,999	45,000+	
Age	18-35	3	15	17	7	42
	36-50	7	25	40	17	89
	51-65	25	45	32	14	116
	66+	38	22	5	3	68
Total		73	107	94	41	315

Table 93. Cross-tabulation (Gender vs Occupation)

Gender * Occupation Crosstabulation

Count

		Occupation					
		Retired	Senior management	Professional	Semi-skilled	Not working	Total
Gender	Male	91	27	29	45	2	194
	Female	27	8	23	38	13	109
Total		118	35	52	83	15	303

Table 94. Cross-tabulation (Gender vs. Total Household Income)

Gender * Total Household income Crosstabulation

Count

		Total Household income				Total
		0-14,999	15-29,999	30-44,999	45,000+	
Gender	Male	45	79	46	27	197
	Female	26	26	45	13	110
Total		71	105	91	40	307

Table 95. Cross-tabulation Household Income vs Occupation)

Total Household income * Occupation Crosstabulation

Count

		Occupation					Total
		Retired	Senior management	Professional	Semi-skilled	Not working	
Total Household income	0-14,999	53	2	1	9	4	69
	15-29,999	38	8	14	32	2	94
	30-44,999	15	16	19	32	7	89
	45,000+	4	10	14	7	2	37
Total		110	36	48	80	15	289

Table 96. Cross-tabulation (Cavity Wall insulation vs Energy Efficient Boiler)

:avity wall insulation * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
cavity wall insulation	Yes	117	156	273
	No	27	40	67
Total		144	196	340

Table 97. Cross-tabulation (Cavity Wall vs Double Glazing)

cavity wall insulation * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
cavity wall insulation	Yes	253	22	275
	No	50	17	67
Total		303	39	342

Table 98. Cross-tabulation (Loft insulation vs energy efficient boiler)

loft insulation * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		
		Yes	No	Total
loft insulation	Yes	144	196	340
Total		144	196	340

Table 99. Cross-tabulation (Loft insulation vs Double Glazing)

loft insulation * Double Glazing Crosstabulation

Count

		Double Glazing		
		Yes	No	Total
loft insulation	Yes	302	39	341
	No	1		1
Total		303	39	342

Table 100. Cross Tabulation (Cavity Wall insulation vs Loft Insulation)

cavity wall insulation * loft insulation Crosstabulation

Count

		loft insulation		
		Yes	No	Total
cavity wall insulation	Yes	274	1	275
	No	67		67
Total		341	1	342

Table 101. Cross-tabulation (Energy efficient Boiler vs Double Glazing)

energy efficient boiler * Double Glazing Crosstabulation

Count

		Double Glazing		
		Yes	No	Total
energy efficient boiler	Yes	131	13	144
	No	170	26	196
Total		301	39	340

Table 102. Cross tabulations of Gender vs. installed energy efficiency measures

Gender * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		
		Yes	No	Total
Gender	Male	174	37	211
	Female	90	28	118
Total		264	65	329

Gender * loft insulation Crosstabulation

Count

		loft insulation		
		Yes	No	Total
Gender	Male	210	1	211
	Female	118		118
Total		328	1	329

Gender * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		
		Yes	No	Total
Gender	Male	89	120	209
	Female	48	70	118
Total		137	190	327

Gender * Double Glazing Crosstabulation

Count

		Double Glazing		
		Yes	No	Total
Gender	Male	187	24	211
	Female	105	13	118
Total		292	37	329

Table 103. Cross-tabulations for Age vs. installed energy efficiency measures

Age * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
Age	18-35	30	15	45
	36-50	74	25	99
	51-65	106	15	121
	66+	64	11	75
Total		274	66	340

Age * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
Age	18-35	45		45
	36-50	99		99
	51-65	121		121
	66+	74	1	75
Total		339	1	340

Age * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
Age	18-35	19	26	45
	36-50	39	60	99
	51-65	49	72	121
	66+	36	37	73
Total		143	195	338

Age * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
Age	18-35	39	6	45
	36-50	84	15	99
	51-65	111	10	121
	66+	67	8	75
Total		301	39	340

Table 104. Cross-tabulations for occupation vs. installed energy efficiency measures

Occupation * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		Total
		Yes	No	
Occupation	Retired	110	10	120
	Senior management	28	7	35
	Professional	41	13	54
	Semi-skilled	60	24	84
	Not working	13	2	15
Total		252	56	308

Occupation * loft insulation Crosstabulation

Count

		loft insulation		Total
		Yes	No	
Occupation	Retired	119	1	120
	Senior management	35		35
	Professional	54		54
	Semi-skilled	84		84
	Not working	15		15
Total		307	1	308

Occupation * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		Total
		Yes	No	
Occupation	Retired	56	62	118
	Senior management	14	21	35
	Professional	18	36	54
	Semi-skilled	34	50	84
	Not working	7	8	15
Total		129	177	306

Occupation * Double Glazing Crosstabulation

Count

		Double Glazing		Total
		Yes	No	
Occupation	Retired	113	7	120
	Senior management	30	5	35
	Professional	49	5	54
	Semi-skilled	70	14	84
	Not working	12	3	15
Total		274	34	308

Table 105. Cross tabulations for total household income vs. installed energy efficiency measures

Total Household income * loft insulation Crosstabulation

Count

		loft insulation		
		Yes	No	Total
Total Household income	0-14,999	73	1	74
	15-29,999	106		106
	30-44,999	94		94
	45,000+	40		40
Total		313	1	314

Total Household income * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		
		Yes	No	Total
Total Household income	0-14,999	33	40	73
	15-29,999	39	67	106
	30-44,999	40	54	94
	45,000+	18	22	40
Total		130	183	313

Total Household income * Double Glazing Crosstabulation

Count

		Double Glazing		
		Yes	No	Total
Total Household income	0-14,999	66	8	74
	15-29,999	93	13	106
	30-44,999	86	8	94
	45,000+	33	7	40
Total		278	36	314

Table 106. Cross tabulations for house location vs. installed energy efficiency measures

House location * cavity wall insulation Crosstabulation

Count

		cavity wall insulation		
		Yes	No	Total
House location	Urban	222	50	272
	Rural	40	10	50
Total		262	60	322

House location * loft insulation Crosstabulation

Count

		loft insulation		
		Yes	No	Total
House location	Urban	271	1	272
	Rural	50		50
Total		321	1	322

House location * energy efficient boiler Crosstabulation

Count

		energy efficient boiler		
		Yes	No	Total
House location	Urban	112	158	270
	Rural	24	26	50
Total		136	184	320

House location * Double Glazing Crosstabulation

Count

		Double Glazing		
		Yes	No	Total
House location	Urban	242	30	272
	Rural	43	7	50
Total		285	37	322

13.2 Comparisons of Means (Parametric tests)

13.2.1 Comparisons of Means for the attitudes

Table 107. Table of Means for the system constructs (Relative Advantage)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	327	9.90	2.752	.152
There is a high level of grant	316	8.50	3.153	.177
Solar systems are an appreciating asset	322	5.65	3.252	.181
The systems are hidden away	329	6.97	3.478	.192
Attractive	327	8.24	3.019	.167
Maintenance free	320	6.43	3.159	.177
Reduces carbon emissions	329	2.12	1.961	.108
Reduces pollution	327	2.23	2.664	.147
Clean	330	2.07	2.131	.117
Generates savings	327	3.88	2.833	.157
Acts all of the time	328	5.17	3.706	.205
Natural	326	4.29	3.967	.220
Solar systems provide a comprehensive solution for hot water and electricity	323	5.59	3.158	.176
Home Improvement	326	4.46	2.809	.156
affordable technology	323	7.23	3.015	.168
Might help sell a house any faster	330	6.43	3.284	.181
Adds value to a property	330	6.73	3.163	.174
Provides a visual statement of beliefs	324	5.10	2.945	.164
safe form of power generation	330	2.27	1.720	.095
Saves fuel	327	2.60	2.101	.116
Toughened, hard to break materials	323	4.55	2.716	.151
Greater flow rate	316	6.43	2.671	.150
Proven and mature	325	5.39	2.896	.161

Table 108. Confidence intervals for the system constructs (Relative Advantage)

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Solar has a short payback	65.037	326	.000	9.90	9.60	10.20
There is a high level of grant	47.909	315	.000	8.50	8.15	8.85
Solar systems are an appreciating asset	31.150	321	.000	5.65	5.29	6.00
The systems are hidden away	36.347	328	.000	6.97	6.59	7.35
Attractive	49.346	326	.000	8.24	7.91	8.57
Maintenance free	36.440	319	.000	6.43	6.09	6.78
Reduces carbon emissions	19.625	328	.000	2.12	1.91	2.33
Reduces pollution	15.132	326	.000	2.23	1.94	2.52
Clean	17.647	329	.000	2.07	1.84	2.30
Generates savings	24.771	326	.000	3.88	3.57	4.19
Acts all of the time	25.271	327	.000	5.17	4.77	5.57
Natural	19.548	325	.000	4.29	3.86	4.73
Solar systems provide a comprehensive solution for hot water and electricity	31.835	322	.000	5.59	5.25	5.94
Home Improvement	28.684	325	.000	4.46	4.16	4.77
affordable technology	43.107	322	.000	7.23	6.90	7.56
Might help sell a house any faster	35.550	329	.000	6.43	6.07	6.78
Adds value to a property	38.677	329	.000	6.73	6.39	7.08
Provides a visual statement of beliefs	31.181	323	.000	5.10	4.78	5.42
safe form of power generation	23.975	329	.000	2.27	2.08	2.46
Saves fuel	22.349	326	.000	2.60	2.37	2.82
Toughened, hard to break materials	30.132	322	.000	4.55	4.26	4.85
Greater flow rate	42.775	315	.000	6.43	6.13	6.72
Proven and mature	33.575	324	.000	5.39	5.08	5.71

Table 109. Table of means for the system constructs (Compatibility)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
The systems are hidden away	329	6.97	3.478	.192
Attractive	327	8.24	3.019	.167
Maintenance free	320	6.43	3.159	.177
Reduces carbon emissions	329	2.12	1.961	.108
Reduces pollution	327	2.23	2.664	.147
Clean	330	2.07	2.131	.117
Acts all of the time	328	5.17	3.706	.205
Natural	326	4.29	3.967	.220
Solar systems provide a comprehensive solution for hot water and electricity	323	5.59	3.158	.176
Will be more widespread in the future	330	3.66	2.404	.132
Solar power is compatible with modern living	329	3.49	2.244	.124
safe form of power generation	330	2.27	1.720	.095
Toughened, hard to break materials	323	4.55	2.716	.151
Greater flow rate	316	6.43	2.671	.150

Table 110. Confidence Intervals for the system constructs (Compatibility)

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
The systems are hidden away	36.347	328	.000	6.97	6.59	7.35
Attractive	49.346	326	.000	8.24	7.91	8.57
Maintenance free	36.440	319	.000	6.43	6.09	6.78
Reduces carbon emissions	19.625	328	.000	2.12	1.91	2.33
Reduces pollution	15.132	326	.000	2.23	1.94	2.52
Clean	17.647	329	.000	2.07	1.84	2.30
Acts all of the time	25.271	327	.000	5.17	4.77	5.57
Natural	19.548	325	.000	4.29	3.86	4.73
Solar systems provide a comprehensive solution for hot water and electricity	31.835	322	.000	5.59	5.25	5.94
Will be more widespread in the future	27.657	329	.000	3.66	3.40	3.92
Solar power is compatible with modern living	28.176	328	.000	3.49	3.24	3.73
safe form of power generation	23.975	329	.000	2.27	2.08	2.46
Toughened, hard to break materials	30.132	322	.000	4.55	4.26	4.85
Greater flow rate	42.775	315	.000	6.43	6.13	6.72

Table 111. Table of Means for the system responses (Complexity)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Maintenance free	320	6.43	3.159	.177
Could develop in the future	328	2.88	2.048	.113
Will be more widespread in the future	330	3.66	2.404	.132
Simple to install in a property	323	7.23	2.922	.163

Table 112. Confidence Intervals for the system responses Complexity)

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Maintenance free	36.440	319	.000	6.43	6.09	6.78
Could develop in the future	25.455	327	.000	2.88	2.66	3.10
Will be more widespread in the future	27.657	329	.000	3.66	3.40	3.92
Simple to install in a property	44.451	322	.000	7.23	6.91	7.55

Table 113. Table of Means for the system responses (Observability)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
The systems are hidden away	329	6.97	3.478	.192
Attractive	327	8.24	3.019	.167
Provides a visual statement of beliefs	324	5.10	2.945	.164
The positioning of solar panels does not affect the visual landscape	328	6.40	3.753	.207

Table 114. Confidence Intervals for the system responses (Observability)

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
The systems are hidden away	36.347	328	.000	6.97	6.59	7.35
Attractive	49.346	326	.000	8.24	7.91	8.57
Provides a visual statement of beliefs	31.181	323	.000	5.10	4.78	5.42
The positioning of solar panels does not affect the visual landscape	30.878	327	.000	6.40	5.99	6.81

13.2.2 *Comparisons of means within groups for constructs relating to Relative Advantage.*

Table 115. Comparison of Means (Male vs Female)

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Male	200	10.05	2.687	.190
	Female	114	9.56	2.857	.268
There is a high level of grant	Male	193	8.63	3.053	.220
	Female	110	8.26	3.199	.305
Solar systems are an appreciating asset	Male	200	5.95	3.337	.236
	Female	109	4.93	2.761	.264
The systems are hidden away	Male	201	6.89	3.664	.258
	Female	115	7.03	3.186	.297
Attractive	Male	200	8.36	2.984	.211
	Female	114	7.93	3.045	.285
Maintenance free	Male	197	6.44	3.272	.233
	Female	110	6.38	3.041	.290
Reduces carbon emissions	Male	201	1.96	1.813	.128
	Female	116	2.45	2.184	.203
Reduces pollution	Male	201	2.06	2.510	.177
	Female	114	2.62	2.997	.281
Clean	Male	202	1.92	1.876	.132
	Female	115	2.40	2.568	.239
Generates savings	Male	200	4.02	2.955	.209
	Female	114	3.66	2.677	.251
Acts all of the time	Male	201	5.30	3.748	.264
	Female	114	4.91	3.674	.344
Natural	Male	199	4.59	4.059	.288
	Female	114	3.80	3.831	.359
Solar systems provide a comprehensive solution	Male	198	6.02	3.281	.233
	Female	113	4.74	2.802	.264
Home Improvement	Male	201	4.78	2.940	.207
	Female	113	3.88	2.528	.238
Might help sell a house any faster	Male	202	6.35	3.238	.228
	Female	115	6.43	3.424	.319
Adds value to a property	Male	202	6.70	3.172	.223
	Female	115	6.69	3.169	.295
Provides a visual statement of beliefs	Male	198	5.26	2.967	.211
	Female	113	4.86	2.930	.276
safe form of power generation	Male	202	2.18	1.711	.120
	Female	115	2.44	1.758	.164
Saves fuel	Male	200	2.58	2.151	.152
	Female	115	2.63	2.075	.193
Toughened, hard to break materials	Male	198	4.63	2.809	.200
	Female	113	4.29	2.531	.238
Greater flow rate	Male	194	6.42	2.759	.198
	Female	111	6.41	2.581	.245
Proven and mature	Male	199	5.41	2.953	.209
	Female	114	5.33	2.831	.265

Table 116. Equality of variances and means (Male vs Female)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	4.605	.033	1.499	312	.135	.48	.323	-.151	1.118
	Equal variances not assumed			1.474	223.438	.142	.48	.328	-.163	1.130
There is a high level of grant	Equal variances assumed	.228	.633	.979	301	.328	.36	.371	-.367	1.094
	Equal variances not assumed			.966	218.149	.335	.36	.376	-.378	1.104
Solar systems are an appreciating asset	Equal variances assumed	4.974	.026	2.718	307	.007	1.02	.375	.281	1.756
	Equal variances not assumed			2.873	259.245	.004	1.02	.354	.320	1.716
The systems are hidden away	Equal variances assumed	7.001	.009	-.344	314	.731	-.14	.409	-.945	.664
	Equal variances not assumed			-.357	265.234	.721	-.14	.394	-.916	.635
Attractive	Equal variances assumed	.566	.453	1.219	312	.224	.43	.353	-.264	1.124
	Equal variances not assumed			1.213	231.262	.226	.43	.355	-.269	1.129
Maintenance free	Equal variances assumed	2.420	.121	.144	305	.886	.05	.380	-.693	.802
	Equal variances not assumed			.147	239.761	.883	.05	.372	-.678	.788
Reduces carbon emissions	Equal variances assumed	12.687	.000	-2.139	315	.033	-.49	.228	-.937	-.039
	Equal variances not assumed			-2.036	205.944	.043	-.49	.240	-.961	-.015
Reduces pollution	Equal variances assumed	7.951	.005	-1.766	313	.078	-.56	.316	-1.180	.064
	Equal variances not assumed			-1.682	202.692	.094	-.56	.332	-1.212	.096
Clean	Equal variances assumed	12.719	.000	-1.926	315	.055	-.48	.251	-.979	.011
	Equal variances not assumed			-1.771	184.187	.078	-.48	.273	-1.024	.055
Generates savings	Equal variances assumed	.891	.346	1.080	312	.281	.36	.335	-.298	1.022
	Equal variances not assumed			1.109	254.737	.268	.36	.326	-.281	1.005
Acts all of the time	Equal variances assumed	.288	.592	.885	313	.377	.39	.436	-.472	1.245
	Equal variances not assumed			.890	238.797	.374	.39	.434	-.469	1.241
Natural	Equal variances assumed	1.041	.308	1.701	311	.090	.79	.467	-.125	1.714
	Equal variances not assumed			1.728	246.817	.085	.79	.460	-.111	1.701
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	2.501	.115	3.462	309	.001	1.27	.367	.549	1.995
	Equal variances not assumed			3.613	263.956	.000	1.27	.352	.579	1.965
Home Improvement	Equal variances assumed	.953	.330	2.723	312	.007	.90	.329	.249	1.544
	Equal variances not assumed			2.841	262.204	.005	.90	.315	.275	1.517
Might help sell a house any faster	Equal variances assumed	.873	.351	-.193	315	.847	-.07	.386	-.835	.685
	Equal variances not assumed			-.190	226.411	.849	-.07	.392	-.847	.698
Adds value to a property	Equal variances assumed	.102	.750	.043	315	.966	.02	.370	-.713	.745
	Equal variances not assumed			.043	237.343	.966	.02	.370	-.713	.746
Provides a visual statement of beliefs	Equal variances assumed	.234	.629	1.161	309	.247	.40	.348	-.281	1.089
	Equal variances not assumed			1.165	235.561	.245	.40	.347	-.280	1.088
safe form of power generation	Equal variances assumed	.560	.455	-1.290	315	.198	-.26	.202	-.657	.137
	Equal variances not assumed			-1.280	231.813	.202	-.26	.203	-.661	.140
Saves fuel	Equal variances assumed	.030	.862	-.241	313	.810	-.06	.249	-.549	.429
	Equal variances not assumed			-.243	244.903	.808	-.06	.246	-.545	.425
Toughened, hard to break materials	Equal variances assumed	.047	.828	1.061	309	.289	.34	.320	-.290	.968
	Equal variances not assumed			1.092	253.564	.276	.34	.311	-.273	.951
Greater flow rate	Equal variances assumed	1.393	.239	.026	303	.979	.01	.321	-.623	.640
	Equal variances not assumed			.026	241.911	.979	.01	.315	-.612	.629
Proven and mature	Equal variances assumed	.425	.515	.230	311	.818	.08	.342	-.594	.751
	Equal variances not assumed			.233	243.739	.816	.08	.338	-.587	.744

Table 117. Comparison of Means (Under 50 vs over 50)

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 3	186	10.07	2.825	.207
	< 3	139	9.64	2.649	.225
There is a high level of grant	>= 3	180	8.83	3.161	.236
	< 3	134	8.02	3.089	.267
Solar systems are an appreciating asset	>= 3	183	5.45	3.360	.248
	< 3	137	5.89	3.031	.259
The systems are hidden away	>= 3	188	7.07	3.654	.266
	< 3	139	6.82	3.255	.276
Attractive	>= 3	187	8.55	3.085	.226
	< 3	138	7.83	2.906	.247
Maintenance free	>= 3	181	6.43	3.370	.250
	< 3	137	6.38	2.849	.243
Reduces carbon emissions	>= 3	189	2.00	1.984	.144
	< 3	138	2.26	1.892	.161
Reduces pollution	>= 3	187	2.00	2.300	.168
	< 3	138	2.51	3.062	.261
Clean	>= 3	189	2.01	2.097	.153
	< 3	139	2.13	2.153	.183
Generates savings	>= 3	187	3.93	2.914	.213
	< 3	138	3.80	2.736	.233
Acts all of the time	>= 3	187	5.09	3.880	.284
	< 3	139	5.32	3.477	.295
Natural	>= 3	186	4.00	3.854	.283
	< 3	138	4.71	4.110	.350
Solar systems provide a comprehensive solution	>= 3	185	5.69	3.391	.249
	< 3	136	5.43	2.814	.241
Home Improvement	>= 3	187	4.47	2.870	.210
	< 3	137	4.42	2.738	.234
Might help sell a house any faster	>= 3	189	6.35	3.426	.249
	< 3	139	6.55	3.100	.263
Adds value to a property	>= 3	188	6.57	3.308	.241
	< 3	140	6.96	2.974	.251
Provides a visual statement of beliefs	>= 3	183	5.02	3.003	.222
	< 3	139	5.22	2.886	.245
safe form of power generation	>= 3	189	2.15	1.730	.126
	< 3	139	2.43	1.707	.145
Saves fuel	>= 3	187	2.59	2.218	.162
	< 3	138	2.60	1.954	.166
Toughened, hard to break materials	>= 3	184	4.38	2.885	.213
	< 3	137	4.77	2.477	.212
Greater flow rate	>= 3	179	6.18	2.870	.215
	< 3	135	6.75	2.374	.204
Proven and mature	>= 3	185	5.14	3.004	.221
	< 3	138	5.71	2.737	.233

Table 118. Equality of Variances and Means (Under 50 vs. over 50)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.325	.569	1.393	323	.165	.43	.308	-.177	1.036
	Equal variances not assumed			1.406	306.905	.161	.43	.306	-.172	1.031
There is a high level of grant	Equal variances assumed	.170	.680	2.270	312	.024	.81	.357	.108	1.514
	Equal variances not assumed			2.278	290.193	.023	.81	.356	.110	1.512
Solar systems are an appreciating asset	Equal variances assumed	2.548	.111	-1.215	318	.225	-.44	.364	-1.159	.274
	Equal variances not assumed			-1.233	307.127	.219	-.44	.359	-1.149	.264
The systems are hidden away	Equal variances assumed	4.138	.043	.638	325	.524	.25	.390	-.519	1.017
	Equal variances not assumed			.649	313.845	.517	.25	.384	-.506	1.004
Attractive	Equal variances assumed	2.481	.116	2.124	323	.034	.72	.338	.053	1.382
	Equal variances not assumed			2.143	304.494	.033	.72	.335	.059	1.376
Maintenance free	Equal variances assumed	8.035	.005	.144	316	.886	.05	.357	-.652	.755
	Equal variances not assumed			.147	312.100	.883	.05	.349	-.636	.739
Reduces carbon emissions	Equal variances assumed	.212	.646	-1.197	325	.232	-.26	.218	-.690	.168
	Equal variances not assumed			-1.206	302.948	.229	-.26	.216	-.686	.165
Reduces pollution	Equal variances assumed	6.735	.010	-1.730	323	.085	-.51	.297	-1.100	.071
	Equal variances not assumed			-1.659	243.723	.098	-.51	.310	-1.126	.097
Clean	Equal variances assumed	.105	.746	-.524	326	.601	-.12	.237	-.590	.342
	Equal variances not assumed			-.522	293.065	.602	-.12	.238	-.593	.344
Generates savings	Equal variances assumed	.517	.473	.379	323	.705	.12	.319	-.506	.748
	Equal variances not assumed			.383	304.933	.702	.12	.316	-.500	.742
Acts all of the time	Equal variances assumed	1.797	.181	-.555	324	.579	-.23	.416	-1.049	.587
	Equal variances not assumed			-.564	312.861	.573	-.23	.409	-1.036	.574
Natural	Equal variances assumed	2.921	.088	-1.594	322	.112	-.71	.445	-1.587	.166
	Equal variances not assumed			-1.579	284.416	.115	-.71	.450	-1.595	.175
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	3.964	.047	.729	319	.467	.26	.357	-.442	.962
	Equal variances not assumed			.749	314.283	.454	.26	.347	-.423	.943
Home Improvement	Equal variances assumed	.452	.502	.172	322	.863	.05	.317	-.568	.677
	Equal variances not assumed			.174	300.682	.862	.05	.314	-.564	.673
Might help sell a house any faster	Equal variances assumed	2.004	.158	-.557	326	.578	-.20	.368	-.928	.519
	Equal variances not assumed			-.565	312.301	.572	-.20	.362	-.918	.508
Adds value to a property	Equal variances assumed	2.942	.087	-1.081	326	.280	-.38	.354	-1.079	.313
	Equal variances not assumed			-1.098	314.586	.273	-.38	.348	-1.068	.303
Provides a visual statement of beliefs	Equal variances assumed	.033	.856	-.600	320	.549	-.20	.332	-.853	.454
	Equal variances not assumed			-.604	302.933	.547	-.20	.330	-.850	.451
safe form of power generation	Equal variances assumed	.052	.821	-1.447	326	.149	-.28	.192	-.656	.100
	Equal variances not assumed			-1.450	299.688	.148	-.28	.192	-.656	.099
Saves fuel	Equal variances assumed	2.490	.116	-.056	323	.956	-.01	.237	-.479	.453
	Equal variances not assumed			-.057	312.991	.955	-.01	.232	-.470	.444
Toughened, hard to break materials	Equal variances assumed	1.918	.167	-1.258	319	.209	-.39	.307	-.990	.218
	Equal variances not assumed			-1.286	312.529	.199	-.39	.300	-.976	.204
Greater flow rate	Equal variances assumed	6.338	.012	-1.872	312	.062	-.57	.304	-1.168	.029
	Equal variances not assumed			-1.922	309.300	.056	-.57	.296	-1.152	.014
Proven and mature	Equal variances assumed	.445	.505	-1.750	321	.081	-.57	.325	-1.210	.071
	Equal variances not assumed			-1.774	308.404	.077	-.57	.321	-1.201	.062

Table 119. Comparison of Means (retired vs. non-retired)

Group Statistics

	Occupation	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 2	183	9.79	2.642	.195
	< 2	110	9.94	2.865	.273
There is a high level of grant	>= 2	180	8.35	3.151	.235
	< 2	104	8.61	3.114	.305
Solar systems are an appreciating asset	>= 2	181	5.77	2.998	.223
	< 2	107	5.24	3.412	.330
The systems are hidden away	>= 2	183	7.01	3.307	.244
	< 2	112	6.82	3.742	.354
Attractive	>= 2	183	8.13	2.842	.210
	< 2	111	8.39	3.234	.307
Maintenance free	>= 2	180	6.54	2.815	.210
	< 2	106	6.20	3.579	.348
Reduces carbon emissions	>= 2	183	2.22	1.983	.147
	< 2	113	2.06	2.015	.190
Reduces pollution	>= 2	184	2.34	2.829	.209
	< 2	110	2.08	2.427	.231
Clean	>= 2	184	2.12	2.172	.160
	< 2	112	2.11	2.279	.215
Generates savings	>= 2	182	4.10	2.810	.208
	< 2	111	3.47	2.676	.254
Acts all of the time	>= 2	183	5.43	3.582	.265
	< 2	111	4.95	4.013	.381
Natural	>= 2	182	4.61	4.073	.302
	< 2	110	4.04	3.867	.369
Solar systems provide a comprehensive solution	>= 2	182	5.45	2.948	.219
	< 2	109	5.86	3.340	.320
Home Improvement	>= 2	184	4.48	2.659	.196
	< 2	110	4.35	2.881	.275
Might help sell a house any faster	>= 2	184	6.42	3.097	.228
	< 2	112	6.34	3.471	.328
Adds value to a property	>= 2	185	6.71	2.969	.218
	< 2	111	6.57	3.391	.322
Provides a visual statement of beliefs	>= 2	182	5.08	2.814	.209
	< 2	109	5.38	3.120	.299
safe form of power generation	>= 2	184	2.42	1.827	.135
	< 2	112	2.09	1.591	.150
Saves fuel	>= 2	183	2.63	1.973	.146
	< 2	112	2.58	2.422	.229
Toughened, hard to break materials	>= 2	182	4.74	2.430	.180
	< 2	109	4.16	2.991	.287
Greater flow rate	>= 2	179	6.82	2.434	.182
	< 2	106	5.91	3.019	.293
Proven and mature	>= 2	183	5.59	2.784	.206
	< 2	110	5.07	3.088	.294

Table 120. Equality of Variances and Means (retired vs non-retired)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.166	.684	-.454	291	.650	-.15	.329	-.797	.498
	Equal variances not assumed			-.445	215.267	.657	-.15	.336	-.811	.512
There is a high level of grant	Equal variances assumed	.144	.705	-.662	282	.509	-.26	.386	-1.016	.505
	Equal variances not assumed			-.664	217.160	.507	-.26	.385	-1.015	.503
Solar systems are an appreciating asset	Equal variances assumed	3.901	.049	1.363	286	.174	.52	.385	-.233	1.283
	Equal variances not assumed			1.319	200.315	.189	.52	.398	-.260	1.310
The systems are hidden away	Equal variances assumed	3.771	.053	.454	293	.650	.19	.417	-.632	1.011
	Equal variances not assumed			.441	212.795	.660	.19	.430	-.658	1.037
Attractive	Equal variances assumed	3.037	.082	-.726	292	.468	-.26	.360	-.971	.448
	Equal variances not assumed			-.704	209.432	.482	-.26	.372	-.995	.472
Maintenance free	Equal variances assumed	13.862	.000	.892	284	.373	.34	.382	-.411	1.093
	Equal variances not assumed			.839	181.345	.402	.34	.406	-.460	1.142
Reduces carbon emissions	Equal variances assumed	.029	.865	.679	294	.498	.16	.239	-.308	.632
	Equal variances not assumed			.677	234.475	.499	.16	.240	-.310	.634
Reduces pollution	Equal variances assumed	.811	.368	.788	292	.431	.26	.324	-.382	.892
	Equal variances not assumed			.819	256.997	.414	.26	.312	-.358	.869
Clean	Equal variances assumed	.208	.648	.047	294	.963	.01	.265	-.510	.534
	Equal variances not assumed			.046	225.778	.963	.01	.268	-.516	.541
Generates savings	Equal variances assumed	.854	.356	1.913	291	.057	.64	.332	-.018	1.290
	Equal variances not assumed			1.936	241.356	.054	.64	.328	-.011	1.283
Acts all of the time	Equal variances assumed	1.096	.296	1.065	292	.288	.48	.451	-.408	1.368
	Equal variances not assumed			1.035	212.047	.302	.48	.464	-.434	1.395
Natural	Equal variances assumed	1.159	.283	1.188	290	.236	.57	.483	-.377	1.524
	Equal variances not assumed			1.203	239.392	.230	.57	.477	-.365	1.512
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	1.643	.201	-1.111	289	.267	-.42	.375	-1.156	.322
	Equal variances not assumed			-1.077	205.573	.283	-.42	.387	-1.181	.347
Home Improvement	Equal variances assumed	.569	.451	.402	292	.688	.13	.331	-.518	.784
	Equal variances not assumed			.394	215.051	.694	.13	.337	-.532	.798
Might help sell a house any faster	Equal variances assumed	1.426	.233	.218	294	.828	.08	.389	-.680	.850
	Equal variances not assumed			.212	214.142	.832	.08	.400	-.703	.872
Adds value to a property	Equal variances assumed	1.998	.159	.388	294	.698	.15	.376	-.594	.886
	Equal variances not assumed			.375	208.106	.708	.15	.389	-.621	.913
Provides a visual statement of beliefs	Equal variances assumed	.399	.528	-.843	289	.400	-.30	.355	-.998	.400
	Equal variances not assumed			-.821	209.192	.413	-.30	.364	-1.018	.419
safe form of power generation	Equal variances assumed	.661	.417	1.603	294	.110	.33	.209	-.076	.745
	Equal variances not assumed			1.658	259.326	.099	.33	.202	-.063	.732
Saves fuel	Equal variances assumed	4.027	.046	.207	293	.836	.05	.258	-.455	.562
	Equal variances not assumed			.197	199.393	.844	.05	.271	-.482	.589
Toughened, hard to break materials	Equal variances assumed	1.538	.216	1.823	289	.069	.59	.321	-.047	1.218
	Equal variances not assumed			1.731	192.322	.085	.59	.338	-.082	1.253
Greater flow rate	Equal variances assumed	8.877	.003	2.785	283	.006	.91	.327	.267	1.553
	Equal variances not assumed			2.637	185.226	.009	.91	.345	.229	1.591
Proven and mature	Equal variances assumed	.320	.572	1.478	291	.140	.52	.350	-.171	1.206
	Equal variances not assumed			1.440	211.293	.151	.52	.359	-.191	1.226

Table 121. Comparison of Means (Income over 50k vs under 50k)

Group Statistics

	Total Household income	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 4	40	10.18	2.218	.351
	< 4	261	9.72	2.864	.177
There is a high level of grant	>= 4	40	8.18	3.265	.516
	< 4	252	8.54	3.136	.198
Solar systems are an appreciating asset	>= 4	38	6.82	2.649	.430
	< 4	259	5.54	3.304	.205
The systems are hidden away	>= 4	40	7.25	3.160	.500
	< 4	262	6.95	3.536	.218
Attractive	>= 4	40	8.00	3.038	.480
	< 4	260	8.11	3.024	.188
Maintenance free	>= 4	40	6.83	2.469	.390
	< 4	255	6.45	3.194	.200
Reduces carbon emissions	>= 4	40	1.53	1.132	.179
	< 4	263	2.26	2.079	.128
Reduces pollution	>= 4	40	2.53	3.602	.570
	< 4	263	2.19	2.442	.151
Clean	>= 4	40	1.95	2.660	.421
	< 4	263	2.11	2.010	.124
Generates savings	>= 4	40	4.30	3.006	.475
	< 4	260	3.91	2.865	.178
Acts all of the time	>= 4	40	4.63	3.571	.565
	< 4	262	5.27	3.694	.228
Natural	>= 4	39	4.79	4.432	.710
	< 4	261	4.31	3.929	.243
Solar systems provide a comprehensive solution	>= 4	40	5.73	3.289	.520
	< 4	260	5.63	3.142	.195
Home Improvement	>= 4	40	4.20	2.210	.349
	< 4	260	4.52	2.900	.180
Might help sell a house any faster	>= 4	40	6.20	2.857	.452
	< 4	263	6.30	3.298	.203
Adds value to a property	>= 4	40	6.48	2.542	.402
	< 4	263	6.68	3.248	.200
Provides a visual statement of beliefs	>= 4	39	4.62	2.123	.340
	< 4	259	5.19	3.012	.187
safe form of power generation	>= 4	40	2.15	1.657	.262
	< 4	263	2.38	1.773	.109
Saves fuel	>= 4	40	2.38	1.931	.305
	< 4	261	2.74	2.171	.134
Toughened, hard to break materials	>= 4	40	4.72	2.353	.372
	< 4	259	4.69	2.777	.173
Greater flow rate	>= 4	40	6.28	2.063	.326
	< 4	253	6.52	2.775	.174
Proven and mature	>= 4	40	5.30	2.554	.404
	< 4	259	5.41	2.894	.180

Table 122. Equality of Variances and Means (Income over 50k vs under 50k)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	4.376	.037	.960	299	.338	.45	.473	-.477	1.386
	Equal variances not assumed			1.157	60.892	.252	.45	.393	-.331	1.240
There is a high level of grant	Equal variances assumed	.023	.880	-.687	290	.493	-.37	.537	-1.425	.688
	Equal variances not assumed			-.667	51.088	.508	-.37	.553	-1.478	.741
Solar systems are an appreciating asset	Equal variances assumed	6.488	.011	2.267	295	.024	1.27	.561	.167	2.375
	Equal variances not assumed			2.669	55.397	.010	1.27	.476	.317	2.226
The systems are hidden away	Equal variances assumed	1.100	.295	.499	300	.618	.30	.592	-.870	1.462
	Equal variances not assumed			.542	55.033	.590	.30	.545	-.797	1.389
Attractive	Equal variances assumed	.001	.982	-.217	298	.828	-.11	.514	-1.123	.900
	Equal variances not assumed			-.216	51.610	.830	-.11	.516	-1.147	.923
Maintenance free	Equal variances assumed	5.342	.022	.708	293	.480	.37	.528	-.666	1.414
	Equal variances not assumed			.853	61.509	.397	.37	.439	-.503	1.251
Reduces carbon emissions	Equal variances assumed	12.410	.000	-2.192	301	.029	-.74	.336	-1.399	-.075
	Equal variances not assumed			-3.349	85.934	.001	-.74	.220	-1.175	-.300
Reduces pollution	Equal variances assumed	3.807	.052	.753	301	.452	.33	.445	-.541	1.210
	Equal variances not assumed			.568	44.611	.573	.33	.589	-.852	1.522
Clean	Equal variances assumed	.026	.872	-.438	301	.662	-.16	.357	-.860	.547
	Equal variances not assumed			-.357	46.021	.723	-.16	.438	-1.039	.726
Generates savings	Equal variances assumed	.544	.461	.801	298	.424	.39	.490	-.572	1.356
	Equal variances not assumed			.773	50.513	.443	.39	.507	-.627	1.411
Acts all of the time	Equal variances assumed	.075	.784	-1.041	300	.299	-.65	.624	-1.879	.579
	Equal variances not assumed			-1.067	52.576	.291	-.65	.609	-1.872	.572
Natural	Equal variances assumed	1.081	.299	.701	298	.484	.48	.686	-.870	1.831
	Equal variances not assumed			.641	47.356	.525	.48	.750	-1.028	1.990
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.053	.819	.168	298	.866	.09	.537	-.966	1.147
	Equal variances not assumed			.163	50.564	.871	.09	.555	-1.025	1.206
Home Improvement	Equal variances assumed	4.049	.045	-.667	298	.506	-.32	.479	-1.262	.623
	Equal variances not assumed			-.812	61.766	.420	-.32	.393	-1.105	.466
Might help sell a house any faster	Equal variances assumed	1.548	.214	-.182	301	.855	-.10	.551	-1.184	.983
	Equal variances not assumed			-.203	56.061	.840	-.10	.495	-1.093	.892
Adds value to a property	Equal variances assumed	4.256	.040	-.390	301	.697	-.21	.537	-1.267	.848
	Equal variances not assumed			-.466	60.230	.643	-.21	.449	-1.108	.689
Provides a visual statement of beliefs	Equal variances assumed	5.395	.021	-1.155	296	.249	-.58	.500	-1.562	.407
	Equal variances not assumed			-1.489	63.668	.141	-.58	.388	-1.353	.198
safe form of power generation	Equal variances assumed	.488	.486	-.759	301	.449	-.23	.298	-.814	.361
	Equal variances not assumed			-.798	53.523	.429	-.23	.284	-.796	.343
Saves fuel	Equal variances assumed	.314	.576	-1.013	299	.312	-.37	.364	-1.084	.347
	Equal variances not assumed			-1.104	55.273	.274	-.37	.334	-1.037	.300
Toughened, hard to break materials	Equal variances assumed	.957	.329	.073	297	.942	.03	.463	-.877	.945
	Equal variances not assumed			.083	57.176	.934	.03	.410	-.787	.855
Greater flow rate	Equal variances assumed	1.702	.193	-.539	291	.590	-.25	.458	-1.148	.654
	Equal variances not assumed			-.667	63.707	.507	-.25	.370	-.986	.492
Proven and mature	Equal variances assumed	1.501	.221	-.218	297	.828	-.11	.484	-1.059	.848
	Equal variances not assumed			-.238	55.666	.812	-.11	.442	-.991	.780

Table 123. Comparison of Means (Income over 30k vs under 30k)

Group Statistics

	Total Household income	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	>= 3	131	9.86	2.739	.239
	< 3	170	9.72	2.831	.217
There is a high level of grant	>= 3	129	8.40	3.273	.288
	< 3	163	8.57	3.059	.240
Solar systems are an appreciating asset	>= 3	129	5.84	3.051	.269
	< 3	168	5.61	3.403	.263
The systems are hidden away	>= 3	131	7.11	3.245	.283
	< 3	171	6.91	3.666	.280
Attractive	>= 3	130	7.88	2.866	.251
	< 3	170	8.26	3.133	.240
Maintenance free	>= 3	129	6.89	2.782	.245
	< 3	166	6.20	3.311	.257
Reduces carbon emissions	>= 3	131	1.95	1.604	.140
	< 3	172	2.33	2.238	.171
Reduces pollution	>= 3	131	2.29	2.894	.253
	< 3	172	2.19	2.397	.183
Clean	>= 3	131	2.17	2.475	.216
	< 3	172	2.02	1.774	.135
Generates savings	>= 3	131	4.25	2.936	.257
	< 3	169	3.73	2.827	.217
Acts all of the time	>= 3	131	5.18	3.508	.306
	< 3	171	5.19	3.815	.292
Natural	>= 3	130	4.62	4.138	.363
	< 3	170	4.19	3.882	.298
Solar systems provide a comprehensive solution	>= 3	131	5.42	2.977	.260
	< 3	169	5.82	3.287	.253
Home Improvement	>= 3	131	4.51	2.606	.228
	< 3	169	4.45	2.978	.229
Might help sell a house any faster	>= 3	131	6.57	3.074	.269
	< 3	172	6.07	3.352	.256
Adds value to a property	>= 3	131	6.86	2.979	.260
	< 3	172	6.50	3.294	.251
Provides a visual statement of beliefs	>= 3	130	4.85	2.582	.226
	< 3	168	5.32	3.140	.242
safe form of power generation	>= 3	131	2.36	1.865	.163
	< 3	172	2.34	1.676	.128
Saves fuel	>= 3	130	2.64	2.091	.183
	< 3	171	2.74	2.184	.167
Toughened, hard to break materials	>= 3	131	4.86	2.532	.221
	< 3	168	4.57	2.859	.221
Greater flow rate	>= 3	129	6.65	2.445	.215
	< 3	164	6.36	2.865	.224
Proven and mature	>= 3	132	5.58	2.633	.229
	< 3	167	5.25	3.005	.233

Table 124. Equality of Variances and Means (Income over 30k vs under 30k)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.771	.381	.447	299	.655	.14	.325	-.494	.784
	Equal variances not assumed			.449	284.041	.654	.14	.323	-.491	.781
There is a high level of grant	Equal variances assumed	1.125	.290	-.471	290	.638	-.18	.372	-.907	.557
	Equal variances not assumed			-.468	265.805	.641	-.18	.375	-.913	.563
Solar systems are an appreciating asset	Equal variances assumed	1.669	.197	.604	295	.546	.23	.381	-.520	.980
	Equal variances not assumed			.612	287.951	.541	.23	.376	-.509	.969
The systems are hidden away	Equal variances assumed	2.341	.127	.495	300	.621	.20	.405	-.597	.998
	Equal variances not assumed			.503	293.757	.616	.20	.399	-.584	.985
Attractive	Equal variances assumed	1.936	.165	-1.064	298	.288	-.37	.352	-1.067	.318
	Equal variances not assumed			-1.076	288.566	.283	-.37	.348	-1.059	.310
Maintenance free	Equal variances assumed	9.604	.002	1.909	293	.057	.69	.363	-.021	1.407
	Equal variances not assumed			1.951	291.184	.052	.69	.355	-.006	1.391
Reduces carbon emissions	Equal variances assumed	8.020	.005	-1.668	301	.096	-.38	.231	-.839	.069
	Equal variances not assumed			-1.743	299.980	.082	-.38	.221	-.819	.050
Reduces pollution	Equal variances assumed	1.282	.259	.323	301	.747	.10	.304	-.500	.697
	Equal variances not assumed			.315	249.546	.753	.10	.312	-.516	.713
Clean	Equal variances assumed	3.176	.076	.593	301	.554	.14	.244	-.336	.625
	Equal variances not assumed			.567	225.370	.571	.14	.255	-.358	.647
Generates savings	Equal variances assumed	.021	.886	1.548	298	.123	.52	.335	-.141	1.177
	Equal variances not assumed			1.541	274.365	.125	.52	.336	-.144	1.180
Acts all of the time	Equal variances assumed	.910	.341	-.023	300	.982	-.01	.428	-.852	.832
	Equal variances not assumed			-.023	290.162	.982	-.01	.423	-.843	.823
Natural	Equal variances assumed	2.016	.157	.905	298	.366	.42	.465	-.495	1.337
	Equal variances not assumed			.897	268.301	.370	.42	.469	-.503	1.345
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	3.110	.079	-1.096	298	.274	-.40	.367	-1.125	.320
	Equal variances not assumed			-1.110	290.821	.268	-.40	.363	-1.116	.311
Home Improvement	Equal variances assumed	2.313	.129	.188	298	.851	.06	.328	-.585	.708
	Equal variances not assumed			.191	293.602	.849	.06	.323	-.574	.697
Might help sell a house any faster	Equal variances assumed	1.164	.281	1.340	301	.181	.50	.375	-.235	1.241
	Equal variances not assumed			1.356	290.789	.176	.50	.371	-.227	1.232
Adds value to a property	Equal variances assumed	1.570	.211	.989	301	.323	.36	.367	-.359	1.084
	Equal variances not assumed			1.003	292.204	.317	.36	.362	-.349	1.074
Provides a visual statement of beliefs	Equal variances assumed	4.147	.043	-1.375	296	.170	-.47	.340	-1.137	.201
	Equal variances not assumed			-1.410	294.879	.160	-.47	.332	-1.120	.185
safe form of power generation	Equal variances assumed	.054	.816	.106	301	.916	.02	.204	-.380	.423
	Equal variances not assumed			.104	263.382	.917	.02	.207	-.386	.429
Saves fuel	Equal variances assumed	1.155	.283	-.394	299	.694	-.10	.250	-.589	.393
	Equal variances not assumed			-.397	283.677	.692	-.10	.248	-.587	.390
Toughened, hard to break materials	Equal variances assumed	2.807	.095	.937	297	.350	.30	.317	-.327	.921
	Equal variances not assumed			.951	292.178	.342	.30	.312	-.318	.912
Greater flow rate	Equal variances assumed	4.371	.037	.921	291	.358	.29	.316	-.331	.914
	Equal variances not assumed			.939	289.031	.349	.29	.310	-.320	.902
Proven and mature	Equal variances assumed	2.614	.107	.996	297	.320	.33	.332	-.322	.983
	Equal variances not assumed			1.012	293.818	.313	.33	.326	-.312	.973

Table 125. Comparison of Means (cavity wall insulation vs none)

Group Statistics

	cavity wall insulation	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Yes	262	9.87	2.771	.171
	No	62	9.92	2.706	.344
There is a high level of grant	Yes	251	8.70	3.135	.198
	No	62	7.77	3.138	.399
Solar systems are an appreciating asset	Yes	260	5.55	3.236	.201
	No	59	6.07	3.264	.425
The systems are hidden away	Yes	264	6.81	3.483	.214
	No	62	7.58	3.429	.435
Attractive	Yes	262	8.23	3.067	.190
	No	62	8.31	2.866	.364
Maintenance free	Yes	255	6.40	3.190	.200
	No	62	6.52	3.007	.382
Reduces carbon emissions	Yes	265	2.07	1.977	.121
	No	61	2.31	1.867	.239
Reduces pollution	Yes	262	2.21	2.692	.166
	No	62	2.34	2.624	.333
Clean	Yes	265	2.01	2.083	.128
	No	62	2.37	2.356	.299
Generates savings	Yes	263	3.75	2.775	.171
	No	61	4.34	3.027	.388
Acts all of the time	Yes	263	5.32	3.780	.233
	No	62	4.50	3.372	.428
Natural	Yes	261	4.26	3.983	.247
	No	62	4.56	3.974	.505
Solar systems provide a comprehensive solution	Yes	258	5.59	3.090	.192
	No	62	5.68	3.439	.437
Home Improvement	Yes	261	4.43	2.834	.175
	No	62	4.61	2.694	.342
Might help sell a house any faster	Yes	265	6.23	3.279	.201
	No	62	7.23	3.251	.413
Adds value to a property	Yes	264	6.63	3.225	.198
	No	63	7.17	2.938	.370
Provides a visual statement of beliefs	Yes	259	5.00	2.937	.182
	No	62	5.53	3.001	.381
safe form of power generation	Yes	265	2.29	1.816	.112
	No	62	2.24	1.276	.162
Saves fuel	Yes	263	2.57	2.162	.133
	No	61	2.69	1.867	.239
Toughened, hard to break materials	Yes	258	4.53	2.787	.174
	No	62	4.66	2.429	.308
Greater flow rate	Yes	251	6.45	2.750	.174
	No	62	6.40	2.315	.294
Proven and mature	Yes	259	5.40	2.915	.181
	No	63	5.38	2.854	.360

Table 126. Equality of variances and Means (Cavity Wall vs. none)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.758	.385	-.126	322	.900	-.05	.390	-.816	.717
	Equal variances not assumed			-.128	93.679	.898	-.05	.384	-.811	.713
There is a high level of grant	Equal variances assumed	.041	.839	2.076	311	.039	.92	.445	.048	1.798
	Equal variances not assumed			2.074	93.390	.041	.92	.445	.039	1.807
Solar systems are an appreciating asset	Equal variances assumed	.056	.813	-1.100	317	.272	-.51	.467	-1.434	.406
	Equal variances not assumed			-1.094	85.813	.277	-.51	.470	-1.448	.420
The systems are hidden away	Equal variances assumed	.000	.983	-1.579	324	.115	-.77	.490	-1.738	.190
	Equal variances not assumed			-1.594	92.891	.114	-.77	.485	-1.738	.190
Attractive	Equal variances assumed	.376	.540	-.190	322	.850	-.08	.428	-.923	.761
	Equal variances not assumed			-.198	96.879	.843	-.08	.410	-.896	.733
Maintenance free	Equal variances assumed	.627	.429	-.269	315	.788	-.12	.447	-.999	.759
	Equal variances not assumed			-.279	97.212	.781	-.12	.431	-.975	.735
Reduces carbon emissions	Equal variances assumed	.106	.745	-.863	324	.389	-.24	.278	-.786	.307
	Equal variances not assumed			-.894	93.557	.373	-.24	.268	-.772	.293
Reduces pollution	Equal variances assumed	.016	.899	-.350	322	.726	-.13	.378	-.877	.612
	Equal variances not assumed			-.356	93.810	.723	-.13	.372	-.872	.607
Clean	Equal variances assumed	1.220	.270	-1.205	325	.229	-.36	.302	-.957	.230
	Equal variances not assumed			-1.117	84.718	.267	-.36	.325	-1.010	.284
Generates savings	Equal variances assumed	1.056	.305	-1.483	322	.139	-.60	.401	-1.385	.194
	Equal variances not assumed			-1.405	84.930	.164	-.60	.424	-1.438	.247
Acts all of the time	Equal variances assumed	.805	.370	1.566	323	.118	.82	.523	-.210	1.849
	Equal variances not assumed			1.681	100.444	.096	.82	.488	-.148	1.787
Natural	Equal variances assumed	.001	.980	-.547	321	.585	-.31	.562	-1.414	.799
	Equal variances not assumed			-.548	92.348	.585	-.31	.562	-1.423	.808
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	2.077	.150	-.206	318	.837	-.09	.447	-.972	.787
	Equal variances not assumed			-.193	86.199	.847	-.09	.477	-1.041	.857
Home Improvement	Equal variances assumed	.183	.669	-.473	321	.637	-.19	.397	-.968	.593
	Equal variances not assumed			-.488	95.728	.627	-.19	.384	-.951	.576
Might help sell a house any faster	Equal variances assumed	.031	.860	-2.156	325	.032	-1.00	.462	-1.904	-.087
	Equal variances not assumed			-2.167	92.284	.033	-1.00	.459	-1.908	-.083
Adds value to a property	Equal variances assumed	.892	.346	-1.227	325	.221	-.55	.445	-1.421	.329
	Equal variances not assumed			-1.300	100.827	.197	-.55	.420	-1.379	.287
Provides a visual statement of beliefs	Equal variances assumed	.189	.664	-1.267	319	.206	-.53	.417	-1.349	.292
	Equal variances not assumed			-1.250	91.036	.214	-.53	.423	-1.368	.311
safe form of power generation	Equal variances assumed	5.617	.018	.184	325	.854	.04	.244	-.435	.524
	Equal variances not assumed			.228	125.906	.820	.04	.197	-.345	.434
Saves fuel	Equal variances assumed	.858	.355	-.381	322	.703	-.11	.300	-.704	.476
	Equal variances not assumed			-.418	100.892	.677	-.11	.274	-.657	.429
Toughened, hard to break materials	Equal variances assumed	.862	.354	-.328	318	.743	-.13	.385	-.884	.631
	Equal variances not assumed			-.357	103.251	.722	-.13	.354	-.828	.576
Greater flow rate	Equal variances assumed	1.514	.220	.135	311	.893	.05	.379	-.694	.796
	Equal variances not assumed			.149	107.730	.882	.05	.341	-.626	.728
Proven and mature	Equal variances assumed	.030	.862	.041	320	.967	.02	.408	-.786	.819
	Equal variances not assumed			.042	95.979	.967	.02	.403	-.782	.816

Table 127. Comparison of Means (Energy Efficient Boiler vs. none)

Group Statistics

	energy efficient boiler	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Yes	138	9.83	2.836	.241
	No	184	9.90	2.703	.199
There is a high level of grant	Yes	134	8.43	3.182	.275
	No	177	8.57	3.131	.235
Solar systems are an appreciating asset	Yes	136	5.25	3.254	.279
	No	181	5.91	3.184	.237
The systems are hidden away	Yes	140	6.91	3.542	.299
	No	184	6.93	3.421	.252
Attractive	Yes	140	8.34	2.979	.252
	No	182	8.13	3.059	.227
Maintenance free	Yes	136	6.41	3.184	.273
	No	179	6.39	3.112	.233
Reduces carbon emissions	Yes	140	2.03	1.889	.160
	No	184	2.17	2.006	.148
Reduces pollution	Yes	139	2.31	2.941	.249
	No	183	2.17	2.474	.183
Clean	Yes	140	2.11	2.235	.189
	No	185	2.04	2.068	.152
Generates savings	Yes	139	3.98	2.977	.252
	No	183	3.79	2.724	.201
Acts all of the time	Yes	139	4.98	3.613	.306
	No	184	5.26	3.770	.278
Natural	Yes	138	4.48	4.100	.349
	No	183	4.21	3.903	.288
Solar systems provide a comprehensive solution	Yes	138	5.83	3.271	.278
	No	180	5.46	3.062	.228
Home Improvement	Yes	140	4.57	2.994	.253
	No	181	4.38	2.651	.197
Might help sell a house any faster	Yes	140	6.49	3.321	.281
	No	185	6.32	3.259	.240
Adds value to a property	Yes	140	6.94	3.210	.271
	No	185	6.55	3.129	.230
Provides a visual statement of beliefs	Yes	140	5.01	2.873	.243
	No	179	5.22	3.014	.225
safe form of power generation	Yes	140	2.30	1.826	.154
	No	185	2.26	1.651	.121
Saves fuel	Yes	139	2.40	2.046	.174
	No	183	2.74	2.152	.159
Toughened, hard to break materials	Yes	138	4.51	2.798	.238
	No	180	4.55	2.603	.194
Greater flow rate	Yes	136	6.40	2.703	.232
	No	175	6.46	2.606	.197
Proven and mature	Yes	141	5.37	2.984	.251
	No	179	5.43	2.832	.212

Table 128. Equality of Variances and Means (Energy efficient boiler vs. None)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.009	.926	-.227	320	.820	-.07	.311	-.682	.541
	Equal variances not assumed			-.226	287.403	.822	-.07	.313	-.687	.545
There is a high level of grant	Equal variances assumed	.240	.625	-.402	309	.688	-.15	.361	-.856	.565
	Equal variances not assumed			-.401	284.084	.688	-.15	.362	-.858	.567
Solar systems are an appreciating asset	Equal variances assumed	.289	.591	-1.814	315	.071	-.66	.365	-1.379	.056
	Equal variances not assumed			-1.808	287.496	.072	-.66	.366	-1.382	.059
The systems are hidden away	Equal variances assumed	.291	.590	-.071	322	.943	-.03	.390	-.794	.739
	Equal variances not assumed			-.071	293.871	.944	-.03	.391	-.798	.743
Attractive	Equal variances assumed	.345	.557	.637	320	.525	.22	.340	-.452	.885
	Equal variances not assumed			.639	302.915	.523	.22	.339	-.450	.883
Maintenance free	Equal variances assumed	.001	.974	.074	313	.941	.03	.358	-.677	.730
	Equal variances not assumed			.073	287.305	.942	.03	.359	-.680	.732
Reduces carbon emissions	Equal variances assumed	.511	.475	-.662	322	.508	-.15	.219	-.577	.286
	Equal variances not assumed			-.668	307.782	.505	-.15	.218	-.574	.283
Reduces pollution	Equal variances assumed	2.373	.124	.445	320	.657	.13	.302	-.460	.729
	Equal variances not assumed			.435	267.628	.664	.13	.309	-.475	.744
Clean	Equal variances assumed	1.185	.277	.319	323	.750	.08	.240	-.395	.548
	Equal variances not assumed			.315	286.587	.753	.08	.242	-.401	.554
Generates savings	Equal variances assumed	1.865	.173	.583	320	.560	.19	.319	-.442	.814
	Equal variances not assumed			.576	282.638	.565	.19	.323	-.450	.822
Acts all of the time	Equal variances assumed	1.909	.168	-.679	321	.498	-.28	.416	-1.101	.536
	Equal variances not assumed			-.683	303.558	.495	-.28	.414	-1.097	.532
Natural	Equal variances assumed	.190	.663	.602	319	.548	.27	.450	-.614	1.155
	Equal variances not assumed			.598	287.255	.551	.27	.453	-.621	1.162
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.293	.589	1.038	316	.300	.37	.357	-.332	1.073
	Equal variances not assumed			1.029	284.619	.304	.37	.360	-.338	1.079
Home Improvement	Equal variances assumed	.794	.374	.602	319	.547	.19	.316	-.431	.811
	Equal variances not assumed			.593	279.324	.554	.19	.321	-.441	.822
Might help sell a house any faster	Equal variances assumed	.139	.709	.458	323	.647	.17	.368	-.556	.893
	Equal variances not assumed			.457	296.485	.648	.17	.369	-.558	.895
Adds value to a property	Equal variances assumed	.359	.549	1.100	323	.272	.39	.354	-.308	1.087
	Equal variances not assumed			1.096	295.397	.274	.39	.356	-.310	1.090
Provides a visual statement of beliefs	Equal variances assumed	.701	.403	-.633	317	.527	-.21	.333	-.866	.445
	Equal variances not assumed			-.636	304.882	.525	-.21	.331	-.862	.441
safe form of power generation	Equal variances assumed	.249	.618	.209	323	.834	.04	.194	-.340	.421
	Equal variances not assumed			.206	282.517	.837	.04	.196	-.346	.427
Saves fuel	Equal variances assumed	.201	.654	-1.436	320	.152	-.34	.237	-.807	.126
	Equal variances not assumed			-1.446	304.427	.149	-.34	.235	-.804	.123
Toughened, hard to break materials	Equal variances assumed	.117	.732	-.141	316	.888	-.04	.304	-.641	.556
	Equal variances not assumed			-.139	283.555	.889	-.04	.307	-.647	.562
Greater flow rate	Equal variances assumed	.312	.577	-.198	309	.843	-.06	.303	-.656	.536
	Equal variances not assumed			-.198	285.039	.844	-.06	.304	-.659	.539
Proven and mature	Equal variances assumed	.876	.350	-.188	318	.851	-.06	.327	-.704	.581
	Equal variances not assumed			-.187	293.094	.852	-.06	.329	-.708	.585

Table 129. Comparison of Means (Double glazing vs. none)

Group Statistics

	Double Glazing	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Yes	286	9.89	2.736	.162
	No	38	9.79	2.924	.474
There is a high level of grant	Yes	276	8.46	3.149	.190
	No	37	8.95	3.188	.524
Solar systems are an appreciating asset	Yes	281	5.64	3.205	.191
	No	38	5.68	3.550	.576
The systems are hidden away	Yes	288	6.95	3.449	.203
	No	38	7.00	3.763	.610
Attractive	Yes	287	8.35	2.943	.174
	No	37	7.38	3.530	.580
Maintenance free	Yes	280	6.45	3.110	.186
	No	37	6.22	3.481	.572
Reduces carbon emissions	Yes	290	2.10	1.944	.114
	No	36	2.25	2.075	.346
Reduces pollution	Yes	286	2.32	2.806	.166
	No	38	1.58	1.154	.187
Clean	Yes	289	2.09	2.198	.129
	No	38	1.97	1.636	.265
Generates savings	Yes	287	3.89	2.861	.169
	No	37	3.68	2.593	.426
Acts all of the time	Yes	287	5.26	3.763	.222
	No	38	4.42	3.277	.532
Natural	Yes	285	4.22	3.891	.230
	No	38	5.03	4.565	.741
Solar systems provide a comprehensive solution	Yes	283	5.65	3.152	.187
	No	37	5.24	3.201	.526
Home Improvement	Yes	286	4.49	2.833	.168
	No	37	4.24	2.597	.427
Might help sell a house any faster	Yes	289	6.34	3.236	.190
	No	38	7.05	3.676	.596
Adds value to a property	Yes	289	6.72	3.162	.186
	No	38	6.82	3.311	.537
Provides a visual statement of beliefs	Yes	283	5.06	2.920	.174
	No	38	5.42	3.202	.519
safe form of power generation	Yes	289	2.30	1.750	.103
	No	38	2.13	1.528	.248
Saves fuel	Yes	286	2.57	2.059	.122
	No	38	2.76	2.465	.400
Toughened, hard to break materials	Yes	284	4.60	2.732	.162
	No	36	4.28	2.625	.438
Greater flow rate	Yes	277	6.53	2.674	.161
	No	36	5.81	2.550	.425
Proven and mature	Yes	286	5.50	2.905	.172
	No	36	4.56	2.741	.457

Table 130. Equality of Variances and Means (Double Glazing vs. none)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.098	.754	.214	322	.830	.10	.476	-.835	1.039
	Equal variances not assumed			.204	46.030	.839	.10	.501	-.907	1.111
There is a high level of grant	Equal variances assumed	.006	.940	-.887	311	.376	-.49	.552	-1.576	.597
	Equal variances not assumed			-.878	45.928	.384	-.49	.557	-1.611	.632
Solar systems are an appreciating asset	Equal variances assumed	.442	.507	-.071	317	.943	-.04	.561	-1.144	1.064
	Equal variances not assumed			-.066	45.535	.948	-.04	.607	-1.262	1.182
The systems are hidden away	Equal variances assumed	.242	.623	-.087	324	.931	-.05	.602	-1.236	1.132
	Equal variances not assumed			-.081	45.584	.936	-.05	.643	-1.348	1.243
Attractive	Equal variances assumed	2.409	.122	1.849	322	.065	.97	.527	-.062	2.009
	Equal variances not assumed			1.607	42.697	.115	.97	.606	-.249	2.196
Maintenance free	Equal variances assumed	1.619	.204	.417	315	.677	.23	.552	-.856	1.316
	Equal variances not assumed			.383	43.933	.704	.23	.602	-.983	1.443
Reduces carbon emissions	Equal variances assumed	.858	.355	-.433	324	.665	-.15	.346	-.831	.531
	Equal variances not assumed			-.412	42.977	.683	-.15	.364	-.885	.585
Reduces pollution	Equal variances assumed	7.555	.006	1.604	322	.110	.74	.461	-.167	1.646
	Equal variances not assumed			2.955	109.234	.004	.74	.250	.243	1.235
Clean	Equal variances assumed	.168	.682	.315	325	.753	.12	.370	-.611	.843
	Equal variances not assumed			.394	56.257	.695	.12	.295	-.475	.707
Generates savings	Equal variances assumed	1.234	.268	.423	322	.672	.21	.495	-.764	1.183
	Equal variances not assumed			.457	48.036	.650	.21	.459	-.713	1.131
Acts all of the time	Equal variances assumed	1.785	.182	1.312	323	.190	.84	.641	-.420	2.100
	Equal variances not assumed			1.459	50.848	.151	.84	.576	-.316	1.997
Natural	Equal variances assumed	3.149	.077	-1.173	321	.242	-.81	.686	-2.156	.545
	Equal variances not assumed			-1.038	44.461	.305	-.81	.776	-2.368	.757
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	.118	.731	.737	318	.462	.41	.552	-.679	1.493
	Equal variances not assumed			.729	45.616	.470	.41	.559	-.718	1.532
Home Improvement	Equal variances assumed	.100	.752	.502	321	.616	.25	.491	-.719	1.211
	Equal variances not assumed			.537	47.795	.594	.25	.459	-.676	1.169
Might help sell a house any faster	Equal variances assumed	3.398	.066	-1.263	325	.207	-.72	.568	-1.834	.400
	Equal variances not assumed			-1.145	44.868	.258	-.72	.626	-1.978	.544
Adds value to a property	Equal variances assumed	.215	.643	-.169	325	.866	-.09	.549	-1.172	.987
	Equal variances not assumed			-.163	46.320	.871	-.09	.568	-1.237	1.051
Provides a visual statement of beliefs	Equal variances assumed	.462	.497	-.700	319	.484	-.36	.510	-1.362	.647
	Equal variances not assumed			-.653	45.654	.517	-.36	.548	-1.460	.745
safe form of power generation	Equal variances assumed	.569	.451	.557	325	.578	.17	.298	-.420	.752
	Equal variances not assumed			.619	50.684	.539	.17	.268	-.373	.705
Saves fuel	Equal variances assumed	2.174	.141	-.521	322	.603	-.19	.364	-.906	.527
	Equal variances not assumed			-.454	44.125	.652	-.19	.418	-1.032	.653
Toughened, hard to break materials	Equal variances assumed	.098	.755	.659	318	.510	.32	.481	-.630	1.264
	Equal variances not assumed			.680	45.165	.500	.32	.467	-.622	1.257
Greater flow rate	Equal variances assumed	.000	.988	1.531	311	.127	.72	.471	-.206	1.649
	Equal variances not assumed			1.588	45.596	.119	.72	.454	-.193	1.636
Proven and mature	Equal variances assumed	.228	.633	1.849	320	.065	.94	.511	-.060	1.949
	Equal variances not assumed			1.935	45.490	.059	.94	.488	-.038	1.927

Table 131. Comparison of Means (Urban vs. rural)

Group Statistics

	House location	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Urban	261	9.96	2.683	.166
	Rural	47	9.36	3.117	.455
There is a high level of grant	Urban	252	8.53	3.198	.201
	Rural	46	8.15	2.890	.426
Solar systems are an appreciating asset	Urban	258	5.85	3.297	.205
	Rural	46	4.78	2.836	.418
The systems are hidden away	Urban	262	7.05	3.421	.211
	Rural	48	6.60	3.746	.541
Attractive	Urban	260	8.33	2.841	.176
	Rural	48	7.33	3.663	.529
Maintenance free	Urban	256	6.51	3.024	.189
	Rural	46	5.91	3.699	.545
Reduces carbon emissions	Urban	261	2.00	1.862	.115
	Rural	49	2.31	2.023	.289
Reduces pollution	Urban	260	2.20	2.713	.168
	Rural	48	2.17	2.107	.304
Clean	Urban	263	2.05	2.217	.137
	Rural	48	2.06	1.590	.229
Generates savings	Urban	261	3.84	2.686	.166
	Rural	47	3.28	2.660	.388
Acts all of the time	Urban	261	5.13	3.648	.226
	Rural	48	5.25	3.949	.570
Natural	Urban	260	4.10	3.872	.240
	Rural	47	5.04	4.389	.640
Solar systems provide a comprehensive solution	Urban	258	5.51	3.024	.188
	Rural	47	5.51	3.532	.515
Home Improvement	Urban	260	4.45	2.721	.169
	Rural	48	4.40	3.292	.475
Might help sell a house any faster	Urban	263	6.49	3.258	.201
	Rural	48	6.29	3.494	.504
Adds value to a property	Urban	263	6.78	3.165	.195
	Rural	48	6.71	3.320	.479
Provides a visual statement of beliefs	Urban	257	5.02	2.845	.177
	Rural	49	5.24	3.185	.455
safe form of power generation	Urban	263	2.16	1.550	.096
	Rural	48	2.69	2.299	.332
Saves fuel	Urban	262	2.40	1.804	.111
	Rural	46	3.11	2.830	.417
Toughened, hard to break materials	Urban	258	4.44	2.645	.165
	Rural	47	4.79	2.941	.429
Greater flow rate	Urban	251	6.41	2.617	.165
	Rural	47	6.40	2.902	.423
Proven and mature	Urban	259	5.33	2.863	.178
	Rural	48	5.42	3.038	.438

Table 132. Equality of Variances and Means (Urban vs. Rural)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	1.858	.174	1.376	306	.170	.60	.436	-.258	1.458
	Equal variances not assumed			1.240	58.910	.220	.60	.484	-.369	1.569
There is a high level of grant	Equal variances assumed	.620	.432	.751	296	.453	.38	.506	-.615	1.374
	Equal variances not assumed			.805	66.759	.424	.38	.471	-.561	1.320
Solar systems are an appreciating asset	Equal variances assumed	2.484	.116	2.068	302	.039	1.07	.517	.052	2.088
	Equal variances not assumed			2.298	68.617	.025	1.07	.466	.141	1.999
The systems are hidden away	Equal variances assumed	.781	.378	.817	308	.415	.45	.545	-.627	1.518
	Equal variances not assumed			.767	62.199	.446	.45	.581	-.715	1.606
Attractive	Equal variances assumed	3.220	.074	2.138	306	.033	1.00	.468	.080	1.923
	Equal variances not assumed			1.797	57.885	.078	1.00	.557	-.114	2.117
Maintenance free	Equal variances assumed	5.484	.020	1.193	300	.234	.60	.502	-.389	1.587
	Equal variances not assumed			1.037	56.316	.304	.60	.577	-.557	1.755
Reduces carbon emissions	Equal variances assumed	1.725	.190	-1.029	308	.304	-.30	.294	-.881	.276
	Equal variances not assumed			-.972	64.178	.335	-.30	.311	-.924	.319
Reduces pollution	Equal variances assumed	.925	.337	.090	306	.928	.04	.413	-.775	.850
	Equal variances not assumed			.107	78.830	.915	.04	.348	-.655	.729
Clean	Equal variances assumed	.378	.539	-.028	309	.978	-.01	.335	-.668	.650
	Equal variances not assumed			-.035	84.353	.972	-.01	.267	-.540	.522
Generates savings	Equal variances assumed	.764	.383	1.324	306	.187	.56	.425	-.274	1.399
	Equal variances not assumed			1.333	64.060	.187	.56	.422	-.281	1.406
Acts all of the time	Equal variances assumed	.807	.370	-.206	307	.837	-.12	.580	-1.262	1.022
	Equal variances not assumed			-.195	62.628	.846	-.12	.613	-1.345	1.106
Natural	Equal variances assumed	2.493	.115	-1.504	305	.134	-.94	.627	-2.176	.291
	Equal variances not assumed			-1.379	59.649	.173	-.94	.684	-2.310	.425
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	4.045	.045	-.006	303	.995	.00	.493	-.972	.967
	Equal variances not assumed			-.005	58.922	.996	.00	.548	-1.100	1.095
Home Improvement	Equal variances assumed	4.763	.030	.114	306	.910	.05	.442	-.820	.921
	Equal variances not assumed			.100	59.433	.921	.05	.504	-.959	1.059
Might help sell a house any faster	Equal variances assumed	1.557	.213	.392	309	.696	.20	.517	-.815	1.220
	Equal variances not assumed			.373	62.817	.710	.20	.543	-.882	1.288
Adds value to a property	Equal variances assumed	.784	.377	.142	309	.887	.07	.501	-.914	1.056
	Equal variances not assumed			.137	63.580	.891	.07	.517	-.963	1.105
Provides a visual statement of beliefs	Equal variances assumed	1.413	.236	-.507	304	.612	-.23	.452	-1.119	.661
	Equal variances not assumed			-.470	63.434	.640	-.23	.488	-1.205	.747
safe form of power generation	Equal variances assumed	6.380	.012	-1.995	309	.047	-.53	.265	-1.048	-.007
	Equal variances not assumed			-1.529	55.055	.132	-.53	.345	-1.220	.164
Saves fuel	Equal variances assumed	9.554	.002	-2.215	306	.027	-.70	.318	-1.330	-.079
	Equal variances not assumed			-1.630	51.601	.109	-.70	.432	-1.571	.163
Toughened, hard to break materials	Equal variances assumed	.449	.503	-.809	303	.419	-.35	.427	-1.185	.495
	Equal variances not assumed			-.752	60.317	.455	-.35	.460	-1.264	.574
Greater flow rate	Equal variances assumed	.227	.634	.014	296	.989	.01	.423	-.827	.839
	Equal variances not assumed			.013	60.825	.989	.01	.454	-.902	.915
Proven and mature	Equal variances assumed	.597	.440	-.195	305	.846	-.09	.454	-.982	.805
	Equal variances not assumed			-.187	63.439	.852	-.09	.473	-1.034	.857

Table 133. Comparison of Means (Electricity vs Mains Gas)

Group Statistics

	Primary fuel type	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Electricity	17	10.06	2.384	.578
	Mains Gas	238	9.77	2.818	.183
There is a high level of grant	Electricity	16	8.38	3.052	.763
	Mains Gas	230	8.42	3.121	.206
Solar systems are an appreciating asset	Electricity	16	4.94	3.316	.829
	Mains Gas	235	5.51	3.153	.206
The systems are hidden away	Electricity	17	7.00	2.979	.723
	Mains Gas	239	6.82	3.507	.227
Attractive	Electricity	17	7.00	3.142	.762
	Mains Gas	238	8.24	2.935	.190
Maintenance free	Electricity	16	5.13	3.364	.841
	Mains Gas	235	6.55	3.135	.205
Reduces carbon emissions	Electricity	16	2.00	1.414	.354
	Mains Gas	240	2.20	1.988	.128
Reduces pollution	Electricity	16	2.25	1.949	.487
	Mains Gas	239	2.17	2.552	.165
Clean	Electricity	17	2.29	2.257	.547
	Mains Gas	239	1.96	1.924	.124
Generates savings	Electricity	17	4.76	3.289	.798
	Mains Gas	238	3.84	2.839	.184
Acts all of the time	Electricity	17	5.12	3.219	.781
	Mains Gas	239	5.12	3.628	.235
Natural	Electricity	17	3.00	3.182	.772
	Mains Gas	237	4.46	4.009	.260
Solar systems provide a comprehensive solution	Electricity	17	5.94	3.897	.945
	Mains Gas	236	5.52	3.095	.201
Home Improvement	Electricity	17	3.71	2.568	.623
	Mains Gas	237	4.59	2.883	.187
Might help sell a house any faster	Electricity	17	7.00	3.335	.809
	Mains Gas	239	6.35	3.214	.208
Adds value to a property	Electricity	17	6.18	2.481	.602
	Mains Gas	239	6.80	3.170	.205
Provides a visual statement of beliefs	Electricity	16	5.06	1.879	.470
	Mains Gas	237	5.14	3.000	.195
safe form of power generation	Electricity	17	1.94	1.713	.415
	Mains Gas	239	2.31	1.735	.112
Saves fuel	Electricity	16	2.25	1.390	.348
	Mains Gas	238	2.58	2.046	.133
Toughened, hard to break materials	Electricity	17	3.94	2.727	.661
	Mains Gas	237	4.51	2.634	.171
Greater flow rate	Electricity	17	5.18	2.604	.631
	Mains Gas	233	6.49	2.659	.174
Proven and mature	Electricity	17	5.18	2.651	.643
	Mains Gas	238	5.33	2.788	.181

Table 134. Equality of Means and Variances (Electricity vs Mains Gas)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	.349	.555	.414	253	.680	.29	.701	-1.091	1.671
	Equal variances not assumed			.478	19.340	.638	.29	.606	-.978	1.558
There is a high level of grant	Equal variances assumed	.026	.871	-.058	244	.954	-.05	.806	-1.634	1.540
	Equal variances not assumed			-.059	17.255	.954	-.05	.790	-1.712	1.619
Solar systems are an appreciating asset	Equal variances assumed	.212	.645	-.701	249	.484	-.57	.817	-2.183	1.037
	Equal variances not assumed			-.671	16.900	.511	-.57	.854	-2.376	1.230
The systems are hidden away	Equal variances assumed	1.991	.160	.201	254	.841	.18	.872	-1.542	1.894
	Equal variances not assumed			.232	19.297	.819	.18	.757	-1.408	1.759
Attractive	Equal variances assumed	.007	.932	-1.680	253	.094	-1.24	.740	-2.702	.214
	Equal variances not assumed			-1.583	18.052	.131	-1.24	.786	-2.894	.406
Maintenance free	Equal variances assumed	.197	.658	-1.750	249	.081	-1.42	.814	-3.027	.179
	Equal variances not assumed			-1.645	16.823	.118	-1.42	.866	-3.251	.404
Reduces carbon emissions	Equal variances assumed	1.022	.313	-.404	254	.687	-.20	.506	-1.200	.792
	Equal variances not assumed			-.543	19.194	.594	-.20	.376	-.991	.583
Reduces pollution	Equal variances assumed	.044	.833	.121	253	.904	.08	.651	-1.203	1.360
	Equal variances not assumed			.152	18.624	.880	.08	.515	-1.000	1.157
Clean	Equal variances assumed	1.797	.181	.679	254	.498	.33	.489	-.630	1.294
	Equal variances not assumed			.591	17.692	.562	.33	.561	-.849	1.513
Generates savings	Equal variances assumed	1.939	.165	1.289	253	.199	.93	.720	-.490	2.347
	Equal variances not assumed			1.134	17.746	.272	.93	.819	-.793	2.650
Acts all of the time	Equal variances assumed	.042	.838	-.004	254	.997	.00	.905	-1.785	1.778
	Equal variances not assumed			-.005	19.013	.996	.00	.815	-1.710	1.702
Natural	Equal variances assumed	3.713	.055	-1.468	252	.143	-1.46	.995	-3.419	.499
	Equal variances not assumed			-1.792	19.833	.088	-1.46	.814	-3.160	.240
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	1.756	.186	.531	251	.596	.42	.792	-1.139	1.979
	Equal variances not assumed			.435	17.485	.669	.42	.966	-1.614	2.454
Home Improvement	Equal variances assumed	.102	.749	-1.225	252	.222	-.88	.719	-2.297	.536
	Equal variances not assumed			-1.354	19.013	.192	-.88	.650	-2.242	.481
Might help sell a house any faster	Equal variances assumed	.078	.780	.802	254	.423	.65	.809	-.944	2.241
	Equal variances not assumed			.776	18.178	.447	.65	.835	-1.105	2.402
Adds value to a property	Equal variances assumed	.786	.376	-.792	254	.429	-.62	.786	-2.171	.925
	Equal variances not assumed			-.980	19.915	.339	-.62	.636	-1.949	.704
Provides a visual statement of beliefs	Equal variances assumed	3.609	.059	-.101	251	.920	-.08	.761	-1.575	1.422
	Equal variances not assumed			-.151	20.572	.882	-.08	.508	-1.136	.982
safe form of power generation	Equal variances assumed	.218	.641	-.837	254	.403	-.36	.435	-1.221	.493
	Equal variances not assumed			-.846	18.415	.408	-.36	.430	-1.267	.538
Saves fuel	Equal variances assumed	1.953	.163	-.643	252	.521	-.33	.520	-1.358	.690
	Equal variances not assumed			-.898	19.657	.380	-.33	.372	-1.111	.443
Toughened, hard to break materials	Equal variances assumed	.450	.503	-.865	252	.388	-.57	.663	-1.879	.732
	Equal variances not assumed			-.840	18.208	.412	-.57	.683	-2.007	.860
Greater flow rate	Equal variances assumed	1.044	.308	-1.968	248	.050	-1.31	.667	-2.627	.001
	Equal variances not assumed			-2.004	18.520	.060	-1.31	.655	-2.686	.061
Proven and mature	Equal variances assumed	.003	.959	-.217	253	.829	-.15	.698	-1.526	1.223
	Equal variances not assumed			-.226	18.620	.823	-.15	.668	-1.551	1.249

13.2.3 *Comparison of Means within groups for constructs relating to attributes other than relative advantage.*

Table 135. Comparison of Means (Male vs Female)

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	Male	201	2.85	2.012	.142
	Female	115	2.85	2.133	.199
Will be more widespread in the future	Male	202	3.51	2.301	.162
	Female	115	3.96	2.610	.243
Solar power is compatible with modern	Male	203	3.44	2.143	.150
	Female	113	3.62	2.451	.231
Simple to install in a property	Male	197	7.42	2.955	.211
	Female	113	6.94	2.829	.266
The positioning of solar panels does not affect	Male	201	6.69	3.717	.262
	Female	115	5.78	3.774	.352

Table 136. Equality of Variances and Means (Male vs Female)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	1.605	.206	-.006	314	.995	.00	.240	-.475	.472
	Equal variances not assumed			-.006	226.218	.995	.00	.244	-.483	.480
Will be more widespread in the future	Equal variances assumed	4.921	.027	-1.564	315	.119	-.44	.282	-.997	.114
	Equal variances not assumed			-1.511	213.496	.132	-.44	.292	-1.018	.135
Solar power is compatible with modern living	Equal variances assumed	5.433	.020	-.665	314	.507	-.18	.265	-.698	.345
	Equal variances not assumed			-.640	206.899	.523	-.18	.275	-.719	.367
Simple to install in a property	Equal variances assumed	2.774	.097	1.392	308	.165	.48	.343	-.198	1.154
	Equal variances not assumed			1.409	241.912	.160	.48	.339	-.190	1.147
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.199	.656	2.080	314	.038	.91	.437	.049	1.769
	Equal variances not assumed			2.071	234.480	.039	.91	.439	.044	1.773

Table 137, Comparison of means (Age under 50 vs over 50)

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	>= 3	188	2.94	2.187	.159
	< 3	138	2.78	1.852	.158
Will be more widespread in the future	>= 3	189	3.78	2.498	.182
	< 3	139	3.47	2.266	.192
Solar power is compatible with modern	>= 3	187	3.40	2.210	.162
	< 3	140	3.59	2.301	.194
Simple to install in a property	>= 3	182	7.33	3.074	.228
	< 3	139	7.08	2.732	.232
The positioning of solar panels does not affect	>= 3	188	6.31	3.859	.281
	< 3	138	6.48	3.623	.308

Table 138. Equality of Variances and Means (Age under 50 vs age over 50)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	1.328	.250	.722	324	.471	.17	.230	-.286	.619
	Equal variances not assumed			.741	317.367	.459	.17	.224	-.275	.607
Will be more widespread in the future	Equal variances assumed	.815	.367	1.155	326	.249	.31	.268	-.218	.838
	Equal variances not assumed			1.173	311.955	.242	.31	.264	-.210	.831
Solar power is compatible with modern living	Equal variances assumed	1.442	.231	-.756	325	.450	-.19	.251	-.685	.305
	Equal variances not assumed			-.751	292.915	.453	-.19	.253	-.688	.308
Simple to install in a property	Equal variances assumed	2.532	.113	.759	319	.449	.25	.330	-.399	.900
	Equal variances not assumed			.771	311.693	.441	.25	.325	-.389	.890
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	1.696	.194	-.390	324	.697	-.16	.422	-.994	.665
	Equal variances not assumed			-.394	305.137	.694	-.16	.418	-.986	.657

Table 139. Comparison of Means (Age under 35 vs Age over 35)

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	>= 2	283	2.88	2.077	.123
	< 2	43	2.84	1.889	.288
Will be more widespread in the future	>= 2	285	3.63	2.368	.140
	< 2	43	3.74	2.656	.405
Solar power is compatible with modern	>= 2	284	3.46	2.253	.134
	< 2	43	3.60	2.238	.341
Simple to install in a property	>= 2	278	7.13	2.951	.177
	< 2	43	7.84	2.734	.417
The positioning of solar panels does not affect	>= 2	283	6.17	3.719	.221
	< 2	43	7.81	3.724	.568

Table 140. Equality of Means (Age under 35 vs Age over 35)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	.217	.642	.116	324	.907	.04	.336	-.622	.700
	Equal variances not assumed			.125	58.556	.901	.04	.313	-.588	.666
Will be more widespread in the future	Equal variances assumed	.339	.561	-.286	326	.775	-.11	.394	-.887	.662
	Equal variances not assumed			-.263	52.569	.794	-.11	.429	-.972	.747
Solar power is compatible with modern living	Equal variances assumed	.025	.876	-.399	325	.690	-.15	.368	-.872	.578
	Equal variances not assumed			-.401	55.689	.690	-.15	.366	-.881	.587
Simple to install in a property	Equal variances assumed	.069	.794	-1.485	319	.139	-.71	.479	-1.654	.231
	Equal variances not assumed			-1.571	58.221	.122	-.71	.453	-1.618	.195
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.115	.734	-2.706	324	.007	-1.65	.609	-2.846	-.450
	Equal variances not assumed			-2.704	55.506	.009	-1.65	.609	-2.869	-.427

Table 141. Comparison of Means (Retired vs non-retired)

Group Statistics

	Occupation	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	>= 2	184	3.01	2.146	.158
	< 2	111	2.74	1.934	.184
Will be more widespread in the future	>= 2	184	3.61	2.215	.163
	< 2	112	3.79	2.745	.259
Solar power is compatible with modern	>= 2	185	3.74	2.286	.168
	< 2	110	3.23	2.237	.213
Simple to install in a property	>= 2	181	7.16	2.640	.196
	< 2	108	7.14	3.225	.310
The positioning of solar panels does not affect	>= 2	183	6.64	3.603	.266
	< 2	112	6.14	3.784	.358

Table 142. Equality of Means (Retired vs non-retired)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	.144	.704	1.072	293	.284	.27	.249	-.223	.756
	Equal variances not assumed			1.100	250.920	.272	.27	.242	-.211	.744
Will be more widespread in the future	Equal variances assumed	2.702	.101	-.639	294	.523	-.19	.291	-.759	.387
	Equal variances not assumed			-.607	197.605	.545	-.19	.306	-.790	.418
Solar power is compatible with modern living	Equal variances assumed	.926	.337	1.880	293	.061	.51	.273	-.024	1.051
	Equal variances not assumed			1.890	233.162	.060	.51	.272	-.022	1.048
Simple to install in a property	Equal variances assumed	3.793	.052	.061	287	.951	.02	.349	-.666	.709
	Equal variances not assumed			.058	191.463	.954	.02	.367	-.703	.746
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.935	.334	1.127	293	.261	.50	.441	-.371	1.364
	Equal variances not assumed			1.114	225.896	.267	.50	.446	-.382	1.375

Table 143. Comparison of Means (Total Household income over 50k vs under 50k)

Group Statistics

	Total Household income	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	>= 4	40	2.55	1.600	.253
	< 4	262	3.00	2.097	.130
Will be more widespread in the future	>= 4	40	3.30	1.924	.304
	< 4	263	3.78	2.446	.151
Solar power is compatible with modern	>= 4	40	3.28	1.921	.304
	< 4	263	3.56	2.299	.142
Simple to install in a property	>= 4	40	7.53	2.542	.402
	< 4	258	7.23	2.914	.181
The positioning of solar panels does not affect	>= 4	40	6.55	3.721	.588
	< 4	262	6.34	3.698	.228

Table 144. Equality of Means (Total Household income over 50k vs under 50k)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	.423	.516	-1.300	300	.195	-.45	.346	-1.131	.231
	Equal variances not assumed			-1.583	61.497	.119	-.45	.284	-1.018	.118
Will be more widespread in the future	Equal variances assumed	1.869	.173	-1.175	301	.241	-.48	.405	-1.272	.321
	Equal variances not assumed			-1.401	59.989	.166	-.48	.340	-1.155	.204
Solar power is compatible with modern living	Equal variances assumed	3.089	.080	-.752	301	.452	-.29	.382	-1.040	.465
	Equal variances not assumed			-.858	57.428	.394	-.29	.335	-.959	.383
Simple to install in a property	Equal variances assumed	.417	.519	.600	296	.549	.29	.487	-.667	1.251
	Equal variances not assumed			.663	56.157	.510	.29	.441	-.591	1.176
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.039	.844	.335	300	.738	.21	.628	-1.026	1.447
	Equal variances not assumed			.333	51.474	.740	.21	.631	-1.056	1.477

Table 145. Comparison of Means (Location Urban vs rural)

Group Statistics

	House location	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	Urban	261	2.86	1.866	.116
	Rural	48	2.92	2.632	.380
Will be more widespread in the future	Urban	263	3.56	2.221	.137
	Rural	48	3.54	2.641	.381
Solar power is compatible with modern	Urban	263	3.45	2.189	.135
	Rural	48	3.33	2.426	.350
Simple to install in a property	Urban	257	7.18	2.815	.176
	Rural	47	7.26	3.333	.486
The positioning of solar panels does not affect	Urban	261	6.40	3.754	.232
	Rural	48	5.52	3.736	.539

Table 146. Equality of Variances and Means (Location Urban vs Rural)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	4.497	.035	-.186	307	.853	-.06	.315	-.677	.560
	Equal variances not assumed			-.147	56.007	.884	-.06	.397	-.854	.737
Will be more widespread in the future	Equal variances assumed	.455	.500	.059	309	.953	.02	.359	-.686	.728
	Equal variances not assumed			.052	59.737	.959	.02	.405	-.789	.831
Solar power is compatible with modern living	Equal variances assumed	.141	.707	.341	309	.733	.12	.349	-.568	.807
	Equal variances not assumed			.317	61.755	.752	.12	.375	-.631	.869
Simple to install in a property	Equal variances assumed	3.536	.061	-.157	302	.875	-.07	.460	-.978	.833
	Equal variances not assumed			-.140	58.606	.889	-.07	.517	-1.107	.962
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.039	.843	1.496	307	.136	.88	.589	-.278	2.041
	Equal variances not assumed			1.501	65.670	.138	.88	.587	-.291	2.054

Table 147. Comparison of Means (Primary Fuel Type Electricity vs Mains Gas)

Group Statistics

	Primary fuel type	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	Electricity	17	2.41	1.734	.421
	Mains Gas	238	2.95	2.001	.130
Will be more widespread in the future	Electricity	17	3.24	2.016	.489
	Mains Gas	239	3.69	2.462	.159
Solar power is compatible with modern	Electricity	17	2.88	2.315	.562
	Mains Gas	239	3.44	2.214	.143
Simple to install in a property	Electricity	16	6.25	2.745	.686
	Mains Gas	238	7.25	2.902	.188
The positioning of solar panels does not affect	Electricity	17	6.06	3.929	.953
	Mains Gas	239	6.20	3.747	.242

Table 148. Equality of Variances and Means (Primary Fuel Type Electricity vs Mains Gas)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	.076	.784	-1.079	253	.282	-.54	.498	-1.520	.444
	Equal variances not assumed			-1.222	19.178	.237	-.54	.440	-1.458	.383
Will be more widespread in the future	Equal variances assumed	.508	.477	-.751	254	.453	-.46	.612	-1.664	.745
	Equal variances not assumed			-.893	19.558	.383	-.46	.514	-1.534	.615
Solar power is compatible with modern living	Equal variances assumed	.192	.662	-.999	254	.319	-.56	.557	-1.655	.541
	Equal variances not assumed			-.961	18.144	.349	-.56	.580	-1.774	.660
Simple to install in a property	Equal variances assumed	.000	.998	-1.335	252	.183	-1.00	.747	-2.469	.474
	Equal variances not assumed			-1.403	17.334	.178	-1.00	.711	-2.497	.501
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.004	.951	-.146	254	.884	-.14	.944	-1.996	1.720
	Equal variances not assumed			-.140	18.133	.890	-.14	.983	-2.202	1.927

Table 149. Comparison of Means (Cavity Wall Insulation vs none)

Group Statistics

	cavity wall insulation	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	Yes	263	2.91	2.144	.132
	No	62	2.79	1.631	.207
Will be more widespread in the future	Yes	265	3.61	2.473	.152
	No	62	3.89	2.136	.271
Solar power is compatible with modern	Yes	263	3.46	2.288	.141
	No	63	3.65	2.088	.263
Simple to install in a property	Yes	258	7.13	2.978	.185
	No	62	7.53	2.696	.342
The positioning of solar panels does not affect	Yes	263	6.28	3.758	.232
	No	62	6.90	3.714	.472

Table 150. Equality of Variances and Means (Cavity Wall Insulation vs None)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	1.341	.248	.408	323	.684	.12	.290	-.453	.690
	Equal variances not assumed			.482	116.298	.631	.12	.246	-.368	.605
Will be more widespread in the future	Equal variances assumed	.729	.394	-.810	325	.419	-.28	.340	-.946	.394
	Equal variances not assumed			-.887	102.949	.377	-.28	.311	-.892	.341
Solar power is compatible with modern living	Equal variances assumed	.360	.549	-.592	324	.554	-.19	.316	-.808	.434
	Equal variances not assumed			-.626	100.815	.533	-.19	.299	-.779	.405
Simple to install in a property	Equal variances assumed	.187	.665	-.977	318	.329	-.40	.414	-1.219	.410
	Equal variances not assumed			-1.038	99.963	.302	-.40	.389	-1.177	.368
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.008	.930	-1.182	323	.238	-.63	.529	-1.667	.416
	Equal variances not assumed			-1.191	92.747	.237	-.63	.526	-1.669	.418

Table 151. Comparison of Means (Energy Efficient Boiler vs. None)

Group Statistics

	energy efficient boiler	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	Yes	139	2.89	2.152	.183
	No	184	2.88	1.983	.146
Will be more widespread in the future	Yes	140	3.76	2.475	.209
	No	185	3.61	2.373	.174
Solar power is compatible with modern	Yes	139	3.68	2.316	.196
	No	185	3.38	2.199	.162
Simple to install in a property	Yes	136	7.49	3.096	.265
	No	182	6.96	2.762	.205
The positioning of solar panels does not affect	Yes	140	6.54	3.876	.328
	No	183	6.30	3.651	.270

Table 152. Equality of Variances and Means (Energy Efficient Boiler vs None)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	.389	.533	.050	321	.960	.01	.231	-.443	.467
	Equal variances not assumed			.050	283.703	.960	.01	.234	-.449	.472
Will be more widespread in the future	Equal variances assumed	.000	.988	.540	323	.589	.15	.271	-.386	.679
	Equal variances not assumed			.537	292.628	.592	.15	.272	-.390	.682
Solar power is compatible with modern living	Equal variances assumed	.168	.682	1.208	322	.228	.31	.253	-.192	.802
	Equal variances not assumed			1.199	288.859	.231	.31	.254	-.196	.806
Simple to install in a property	Equal variances assumed	5.386	.021	1.611	316	.108	.53	.330	-.118	1.180
	Equal variances not assumed			1.584	271.656	.114	.53	.335	-.129	1.191
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.433	.511	.588	321	.557	.25	.421	-.581	1.076
	Equal variances not assumed			.584	289.758	.560	.25	.424	-.588	1.083

Table 153. Comparison of Means (Double Glazing vs None)

Group Statistics

	Double Glazing	N	Mean	Std. Deviation	Std. Error Mean
Could develop in the future	Yes	287	2.95	2.078	.123
	No	38	2.39	1.809	.293
Will be more widespread in the future	Yes	289	3.72	2.368	.139
	No	38	3.24	2.726	.442
Solar power is compatible with modern	Yes	288	3.58	2.237	.132
	No	38	2.87	2.268	.368
Simple to install in a property	Yes	284	7.24	2.950	.175
	No	36	6.92	2.750	.458
The positioning of solar panels does not affect	Yes	287	6.32	3.732	.220
	No	38	7.00	3.897	.632

Table 154. Equality of Variances and Means (Double Glazing vs None)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Could develop in the future	Equal variances assumed	.109	.741	1.573	323	.117	.56	.354	-.139	1.252
	Equal variances not assumed			1.750	50.861	.086	.56	.318	-.082	1.195
Will be more widespread in the future	Equal variances assumed	.533	.466	1.161	325	.247	.48	.416	-.336	1.301
	Equal variances not assumed			1.042	44.649	.303	.48	.464	-.451	1.417
Solar power is compatible with modern living	Equal variances assumed	.088	.767	1.849	324	.065	.71	.387	-.046	1.476
	Equal variances not assumed			1.829	47.006	.074	.71	.391	-.071	1.501
Simple to install in a property	Equal variances assumed	.354	.552	.630	318	.529	.33	.518	-.693	1.346
	Equal variances not assumed			.665	45.830	.509	.33	.491	-.661	1.314
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.366	.546	-1.054	323	.292	-.68	.648	-1.957	.591
	Equal variances not assumed			-1.020	46.443	.313	-.68	.670	-2.030	.664

Figure 20. Key to Characteristics of Solar Power systems

No	Characteristic
1	Solar has a short payback
2	There is a high level of grant
3	Solar systems are an appreciating asset
4	The systems are hidden away
5	Attractive
6	Maintenance free
7	Reduces carbon emissions
8	Reduces pollution
9	Clean
10	Generates savings
11	Acts all of the time
12	Natural
13	Solar systems provide a comprehensive solution for hot water and electricity
14	Home Improvement
15	Affordable technology
16	Could develop in the future
17	Might help sell a house any faster
18	Adds value to a property
19	Provides a visual statement of beliefs
20	Will be more widespread in the future
21	Solar power is compatible with modern living
22	Simple to install in a property
23	Safe form of power generation
24	The positioning of solar panels does not affect the visual landscape
25	Saves fuel
26	Proven and mature
27	Greater flow rate
28	Toughened, hard to break materials

Figure 21. Graph showing attitudes to constructs of Relative Advantage

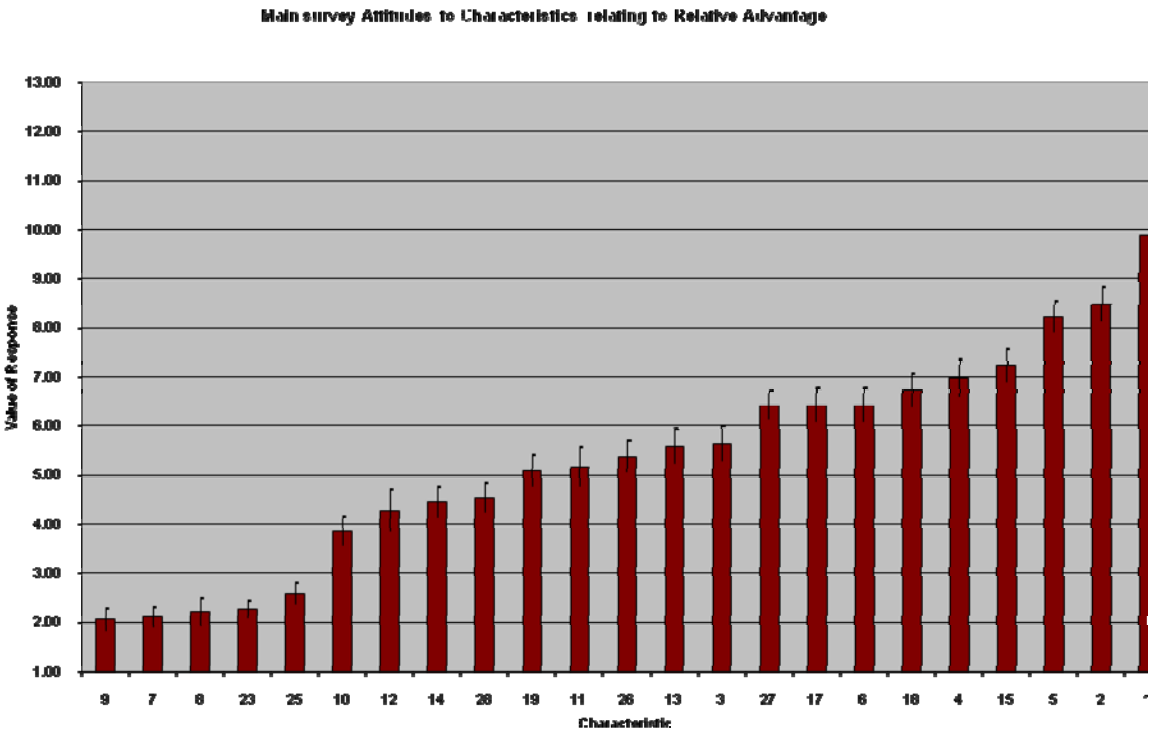


Figure 22. Graph showing attitudes to constructs of compatibility

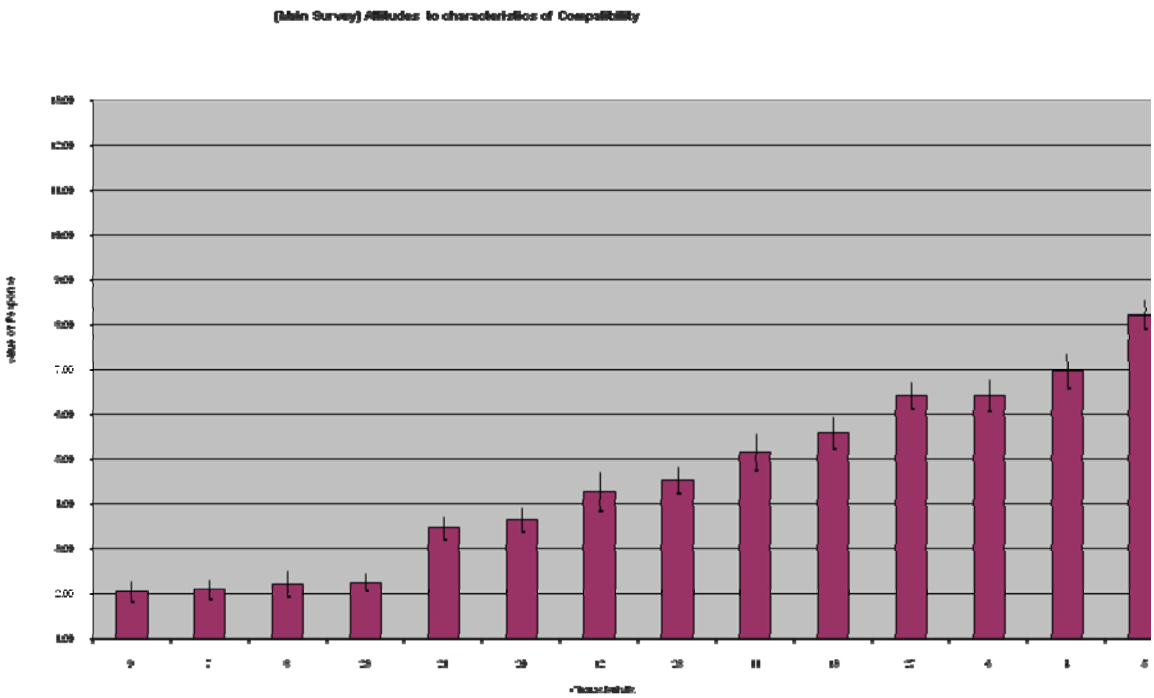


Figure 23. Graph showing attitudes to constructs of Complexity

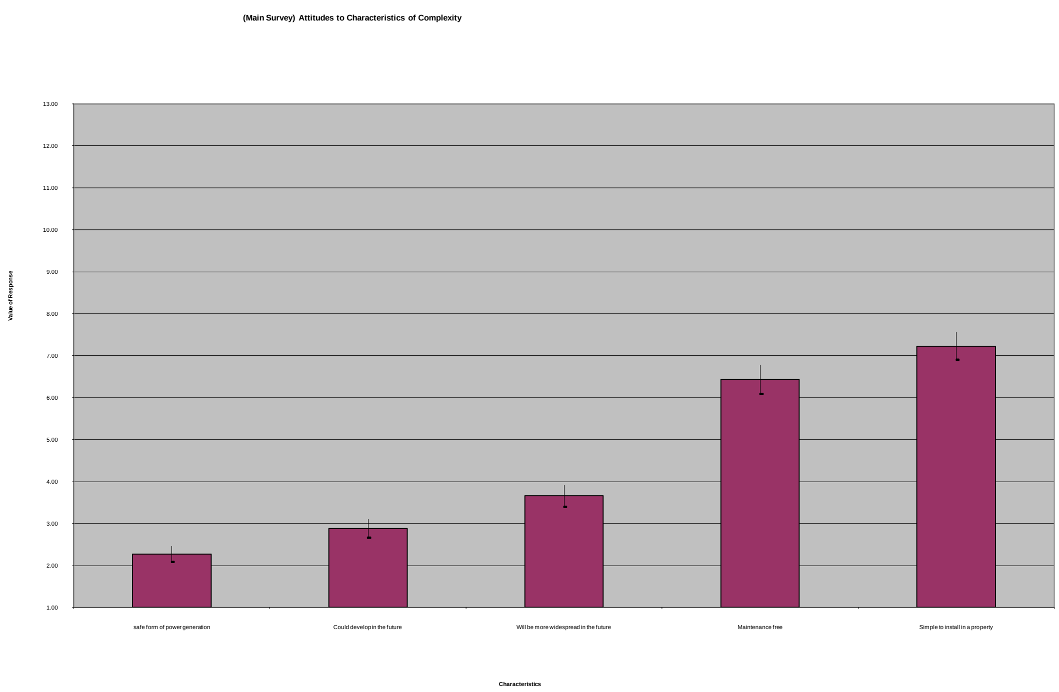
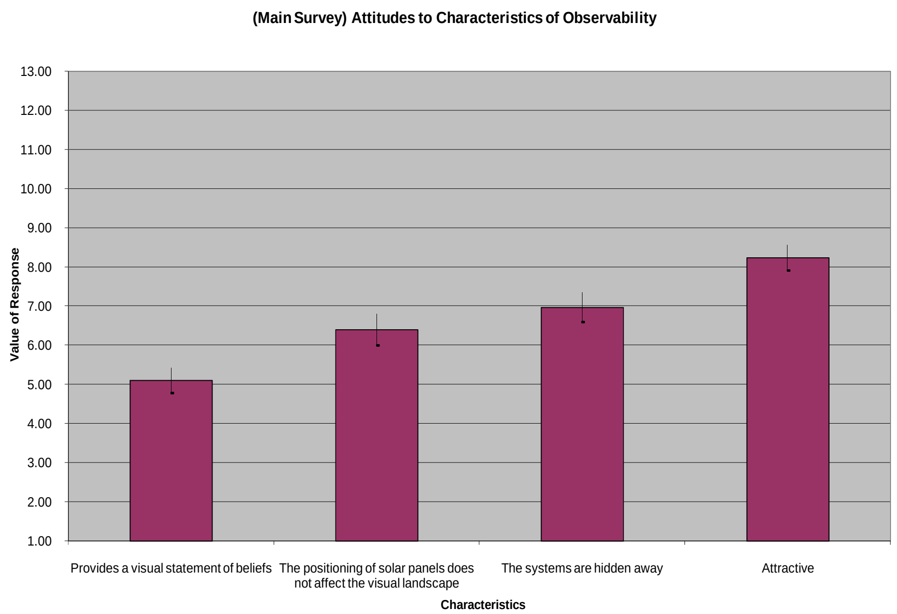


Figure 24. Graph showing attitudes to constructs of observability



13.3 Comparisons of Means (Non-Parametric tests)

Table 155. Mann Whitney test of means for adoption statements (Male vs Female)

Ranks

	Gender	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Male	211	164.45	34698.50
	Female	119	167.37	19916.50
	Total	330		
Only if it works with what I have	Male	208	165.03	34326.50
	Female	117	159.39	18648.50
	Total	325		
Too complex, likely to discourage	Male	206	162.65	33506.00
	Female	117	160.85	18820.00
	Total	323		
Not seen before, less likely to buy	Male	209	160.98	33644.50
	Female	116	166.64	19330.50
	Total	325		
Try it first, more likely to buy	Male	212	166.55	35308.00
	Female	120	166.42	19970.00
	Total	332		
Knowing a product fits with my lifestyle is more important than trying it first	Male	206	163.14	33606.00
	Female	116	158.59	18397.00
	Total	322		

Test Statistics[a]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	12332.500	11745.500	11917.000	11699.500	12710.000	11611.000
Wilcoxon W	34698.500	18648.500	18820.000	33644.500	19970.000	18397.000
Z	-.593	-.683	-.198	-.614	-.034	-.514
Asymp. Sig. (2-tailed)	.553	.495	.843	.540	.973	.607

a. Grouping Variable: Gender

Table 156. Kruskall Wallis test for means of adoption statements between age groups

Ranks

	Age	N	Mean Rank
Advantage and Benefits most important	18-35	45	177.94
	36-50	98	172.92
	51-65	123	168.70
	66+	75	168.09
	Total	341	
Only if it works with what I have	18-35	43	183.10
	36-50	96	187.50
	51-65	122	163.06
	66+	75	144.66
	Total	336	
Too complex, likely to discourage	18-35	44	174.82
	36-50	96	190.00
	51-65	123	154.02
	66+	71	155.89
	Total	334	
Not seen before, less likely to buy	18-35	44	173.55
	36-50	97	199.72
	51-65	122	157.46
	66+	73	142.42
	Total	336	
Try it first, more likely to buy	18-35	45	176.43
	36-50	99	173.66
	51-65	124	167.77
	66+	75	174.15
	Total	343	
Knowing a product fits with my lifestyle is more important than trying it first	18-35	44	185.16
	36-50	97	164.64
	51-65	120	173.05
	66+	72	149.00
	Total	333	

Test Statistics[a,b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Chi-Square	1.999	16.459	12.778	23.542	3.227	6.891
df	3	3	3	3	3	3
Asymp. Sig.	.573	.001	.005	.000	.358	.075

a. Kruskal Wallis Test

b. Grouping Variable: Age

Table 157. Kruskall Wallis test for means of adoption statements between occupation type.

Ranks

	Occupation	N	Mean Rank
Advantage and Benefits most important	Retired	119	150.47
	Senior management	36	156.83
	Professional	54	163.96
	Semi-skilled	85	151.25
	Not working	14	166.00
	Total	308	
Only if it works with what I have	Retired	120	137.60
	Senior management	35	168.29
	Professional	52	177.59
	Semi-skilled	84	157.76
	Not working	14	126.89
	Total	305	
Too complex, likely to discourage	Retired	118	143.69
	Senior management	35	148.10
	Professional	52	160.17
	Semi-skilled	83	156.34
	Not working	13	154.38
	Total	301	
Not seen before, less likely to buy	Retired	117	131.64
	Senior management	35	169.41
	Professional	52	164.34
	Semi-skilled	84	165.45
	Not working	15	152.10
	Total	303	
Try it first, more likely to buy	Retired	120	152.38
	Senior management	36	161.42
	Professional	54	159.98
	Semi-skilled	85	155.79
	Not working	15	148.50
	Total	310	
Knowing a product fits with my lifestyle is more important than trying it first	Retired	116	141.02
	Senior management	36	146.33
	Professional	51	159.32
	Semi-skilled	83	160.74
	Not working	14	146.93
	Total	300	

Test Statistics[a,b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Chi-Square	6.426	18.541	2.569	14.883	4.098	4.766
df	4	4	4	4	4	4
Asymp. Sig.	.169	.001	.632	.005	.393	.312

a. Kruskal Wallis Test

b. Grouping Variable: Occupation

Table 158. Kruskall Wallis test for means of adoption statements between income levels

Ranks

	Total Household income	N	Mean Rank
Advantage and Benefits most important	0-14,999	73	155.63
	15-29,999	106	155.92
	30-44,999	95	158.61
	45,000+	41	166.21
	Total	315	
Only if it works with what I have	0-14,999	73	142.56
	15-29,999	104	166.34
	30-44,999	93	153.78
	45,000+	41	158.72
	Total	311	
Too complex, likely to discourage	0-14,999	71	142.05
	15-29,999	103	160.79
	30-44,999	93	149.49
	45,000+	41	171.62
	Total	308	
Not seen before, less likely to buy	0-14,999	74	128.22
	15-29,999	105	157.66
	30-44,999	91	159.14
	45,000+	41	194.90
	Total	311	
Try it first, more likely to buy	0-14,999	74	157.28
	15-29,999	107	155.96
	30-44,999	95	163.01
	45,000+	41	160.73
	Total	317	
Knowing a product fits with my lifestyle is more important than trying it first	0-14,999	71	138.48
	15-29,999	103	157.81
	30-44,999	93	167.54
	45,000+	40	140.26
	Total	307	

Test Statistics[a,b]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Chi-Square	2.268	5.499	5.270	20.532	3.112	8.196
df	3	3	3	3	3	3
Asymp. Sig.	.519	.139	.153	.000	.375	.042

a. Kruskal Wallis Test

b. Grouping Variable: Total Household income

Table 159. Mann Whitney test from means for adoption statements between household location

Ranks

	House location	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Urban	274	161.78	44327.00
	Rural	50	166.46	8323.00
	Total	324		
Only if it works with what I have	Urban	269	161.10	43335.50
	Rural	50	154.09	7704.50
	Total	319		
Too complex, likely to discourage	Urban	269	156.39	42068.00
	Rural	48	173.65	8335.00
	Total	317		
Not seen before, less likely to buy	Urban	270	161.69	43655.00
	Rural	50	154.10	7705.00
	Total	320		
Try it first, more likely to buy	Urban	275	163.09	44850.00
	Rural	50	162.50	8125.00
	Total	325		
Knowing a product fits with my lifestyle is more important than trying it first	Urban	266	160.92	42804.00
	Rural	50	145.64	7282.00
	Total	316		

Test Statistics[a]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	6652.000	6429.500	5753.000	6430.000	6850.000	6007.000
Wilcoxon W	44327.000	7704.500	42068.000	7705.000	8125.000	7282.000
Z	-.819	-.652	-1.440	-.628	-.116	-1.323
Asymp. Sig. (2-tailed)	.413	.514	.150	.530	.907	.186

a. Grouping Variable: House location

Table 160. Mann Whitney test for means between adoption statements for respondents with and without CWI

Ranks

	cavity wall insulation	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Yes	274	167.19	45809.00
	No	66	184.26	12161.00
	Total	340		
Only if it works with what I have	Yes	269	166.96	44913.50
	No	66	172.22	11366.50
	Total	335		
Too complex, likely to discourage	Yes	269	167.28	44997.50
	No	64	165.84	10613.50
	Total	333		
Not seen before, less likely to buy	Yes	270	163.78	44220.00
	No	65	185.54	12060.00
	Total	335		
Try it first, more likely to buy	Yes	275	171.34	47118.50
	No	67	172.16	11534.50
	Total	342		
Knowing a product fits with my lifestyle is more important than trying it first	Yes	267	165.30	44135.50
	No	65	171.42	11142.50
	Total	332		

Test Statistics[a]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	8134.000	8598.500	8533.500	7635.000	9168.500	8357.500
Wilcoxon W	45809.000	44913.500	10613.500	44220.000	47118.500	44135.500
Z	-2.855	-.518	-.129	-1.914	-.177	-.563
Asymp. Sig. (2-tailed)	.004	.604	.897	.056	.860	.573

a. Grouping Variable: cavity wall insulation

Table 161. Mann Whitney test for means of adoption statements for respondents with EEBoilers

Ranks

	energy efficient boiler	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Yes	144	164.54	23694.00
	No	194	173.18	33597.00
	Total	338		
Only if it works with what I have	Yes	143	162.59	23250.00
	No	190	170.32	32361.00
	Total	333		
Too complex, likely to discourage	Yes	142	164.94	23421.50
	No	189	166.80	31524.50
	Total	331		
Not seen before, less likely to buy	Yes	144	165.44	23824.00
	No	190	169.06	32121.00
	Total	334		
Try it first, more likely to buy	Yes	144	169.40	24394.00
	No	196	171.31	33576.00
	Total	340		
Knowing a product fits with my lifestyle is more important than trying it first	Yes	142	157.09	22307.00
	No	188	171.85	32308.00
	Total	330		

Test Statistics[a]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	13254.000	12954.000	13268.500	13384.000	13954.000	12154.000
Wilcoxon W	23694.000	23250.000	23421.500	23824.000	24394.000	22307.000
Z	-1.807	-.950	-.209	-.399	-.513	-1.700
Asymp. Sig. (2-tailed)	.071	.342	.834	.690	.608	.089

a. Grouping Variable: energy efficient boiler

14 Appendix H. Comparison between the two respondent groups (Early adopters vs Early Majority)

This appendix contains the tables generated from the statistical tests carried out to compare the attitudes between the two respondent groups (the early adopters and the early majority. The tests carried out were:

- Comparison of Means regarding Attitudes to constructs
- Equalities of Variance and Means for Attitudes to constructs
- Cross-tabulation of Socio-economic groups in relation to ‘adoption statements’
- Comparison of Means of the two respondent groups in relation to the ‘Adoption statements’

14.1 Comparison of Means (Parametric Tests)

14.1.1 Comparison of Means for attitudes between the two respondent groups

Table 162. Table of Means between the two respondent groups

Group Statistics

	Data Group	N	Mean	Std. Deviation	Std. Error Mean
Solar has a short payback	Explorers	42	10.86	2.465	.380
	Main	327	9.90	2.752	.152
There is a high level of grant	Explorers	42	7.31	3.453	.533
	Main	316	8.50	3.153	.177
Solar systems are an appreciating asset	Explorers	41	5.00	2.636	.412
	Main	322	5.65	3.252	.181
The systems are hidden away	Explorers	42	5.24	2.801	.432
	Main	329	6.97	3.478	.192
Attractive	Explorers	41	6.49	2.785	.435
	Main	327	8.24	3.019	.167
Solar systems needs less maintenance than	Explorers	41	4.98	3.205	.501
	Main	320	6.43	3.159	.177
Reduces carbon emissions	Explorers	43	2.49	2.798	.427
	Main	329	2.12	1.961	.108
Reduces pollution	Explorers	43	1.72	1.517	.231
	Main	327	2.23	2.664	.147
Clean	Explorers	43	1.91	2.158	.329
	Main	330	2.07	2.131	.117
Generates savings	Explorers	42	4.69	4.069	.628
	Main	327	3.88	2.833	.157
Acts all of the time	Explorers	43	4.70	3.583	.546
	Main	328	5.17	3.706	.205
Natural	Explorers	43	4.53	4.239	.646
	Main	326	4.29	3.967	.220
Solar systems provide a comprehensive solution	Explorers	42	4.38	2.641	.407
	Main	323	5.59	3.158	.176
Home Improvement	Explorers	43	3.12	2.602	.397
	Main	326	4.46	2.809	.156
affordable technology	Explorers	41	6.15	3.698	.578
	Main	323	7.23	3.015	.168
Could develop in the future	Explorers	43	1.98	1.263	.193
	Main	328	2.88	2.048	.113
Might help sell a house any faster	Explorers	43	5.70	2.924	.446
	Main	330	6.43	3.284	.181
Adds value to a property	Explorers	43	5.37	2.920	.445
	Main	330	6.73	3.163	.174
Provides a visual statement of beliefs	Explorers	43	4.63	3.288	.501
	Main	324	5.10	2.945	.164
Will be more widespread in the future	Explorers	43	2.07	1.352	.206
	Main	330	3.66	2.404	.132
Solar power is compatible with modern living	Explorers	43	2.05	1.479	.226
	Main	329	3.49	2.244	.124
Simple to install in a property	Explorers	41	5.32	3.424	.535
	Main	323	7.23	2.922	.163
safe form of power generation	Explorers	43	1.60	1.198	.183
	Main	330	2.27	1.720	.095
The positioning of solar panels does not affect the	Explorers	43	4.95	3.754	.572
	Main	328	6.40	3.753	.207

Table 163. Equalities of Variances and Means for attitudes of the two groups.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Solar has a short payback	Equal variances assumed	1.572	.211	2.147	367	.032	.96	.446	.081	1.835
	Equal variances not assumed			2.338	55.004	.023	.96	.410	.137	1.779
There is a high level of grant	Equal variances assumed	.010	.919	-2.267	356	.024	-1.19	.524	-2.217	-.157
	Equal variances not assumed			-2.114	50.506	.039	-1.19	.562	-2.315	-.060
Solar systems are an appreciating asset	Equal variances assumed	2.729	.099	-1.221	361	.223	-.65	.529	-1.686	.394
	Equal variances not assumed			-1.436	56.741	.157	-.65	.450	-1.547	.255
The systems are hidden away	Equal variances assumed	1.550	.214	-3.099	369	.002	-1.73	.559	-2.830	-.633
	Equal variances not assumed			-3.662	58.448	.001	-1.73	.473	-2.678	-.785
Attractive	Equal variances assumed	2.332	.128	-3.529	366	.000	-1.75	.496	-2.726	-.775
	Equal variances not assumed			-3.758	52.516	.000	-1.75	.466	-2.685	-.816
Solar systems needs less maintenance than existing heating systems	Equal variances assumed	.117	.733	-2.780	359	.006	-1.46	.525	-2.491	-.427
	Equal variances not assumed			-2.748	50.474	.008	-1.46	.531	-2.525	-.393
Reduces carbon emissions	Equal variances assumed	6.073	.014	1.091	370	.276	.37	.336	-.294	1.028
	Equal variances not assumed			.833	47.541	.409	.37	.440	-.518	1.252
Reduces pollution	Equal variances assumed	3.839	.051	-1.225	368	.221	-.51	.415	-1.325	.308
	Equal variances not assumed			-1.854	81.255	.067	-.51	.274	-1.054	.037
Clean	Equal variances assumed	.314	.576	-.470	371	.638	-.16	.346	-.843	.518
	Equal variances not assumed			-.466	53.234	.643	-.16	.349	-.863	.538
Generates savings	Equal variances assumed	15.095	.000	1.649	367	.100	.81	.491	-.156	1.776
	Equal variances not assumed			1.251	46.240	.217	.81	.647	-.493	2.112
Acts all of the time	Equal variances assumed	.002	.968	-.790	369	.430	-.47	.599	-1.651	.704
	Equal variances not assumed			-.811	54.471	.421	-.47	.583	-1.642	.696
Natural	Equal variances assumed	.344	.558	.371	367	.711	.24	.649	-1.035	1.516
	Equal variances not assumed			.352	52.172	.726	.24	.683	-1.130	1.610
Solar systems provide a comprehensive solution for hot water and electricity	Equal variances assumed	2.065	.152	-2.383	363	.018	-1.21	.509	-2.215	-.212
	Equal variances not assumed			-2.735	57.417	.008	-1.21	.444	-2.102	-.325
Home Improvement	Equal variances assumed	1.006	.317	-2.979	367	.003	-1.35	.452	-2.236	-.458
	Equal variances not assumed			-3.160	55.736	.003	-1.35	.426	-2.201	-.493
affordable technology	Equal variances assumed	4.791	.029	-2.114	362	.035	-1.09	.514	-2.096	-.076
	Equal variances not assumed			-1.805	46.993	.077	-1.09	.601	-2.296	.124
Could develop in the future	Equal variances assumed	4.749	.030	-2.815	369	.005	-.90	.320	-1.531	-.272
	Equal variances not assumed			-4.036	74.804	.000	-.90	.223	-1.346	-.456
Might help sell a house any faster	Equal variances assumed	.971	.325	-1.387	371	.166	-.73	.526	-1.764	.305
	Equal variances not assumed			-1.516	56.749	.135	-.73	.481	-1.693	.234
Adds value to a property	Equal variances assumed	.212	.645	-2.677	371	.008	-1.36	.508	-2.361	-.361
	Equal variances not assumed			-2.847	55.657	.006	-1.36	.478	-2.319	-.403
Provides a visual statement of beliefs	Equal variances assumed	.679	.411	-.978	365	.329	-.47	.485	-1.427	.479
	Equal variances not assumed			-.899	51.345	.373	-.47	.527	-1.533	.585
Will be more widespread in the future	Equal variances assumed	8.932	.003	-4.249	371	.000	-1.59	.374	-2.327	-.855
	Equal variances not assumed			-6.492	81.962	.000	-1.59	.245	-2.078	-1.103
Solar power is compatible with modern living	Equal variances assumed	8.848	.003	-4.090	370	.000	-1.44	.352	-2.132	-.748
	Equal variances not assumed			-5.596	70.259	.000	-1.44	.257	-1.953	-.927
Simple to install in a property	Equal variances assumed	4.593	.033	-3.862	362	.000	-1.91	.494	-2.881	-.937
	Equal variances not assumed			-3.416	47.686	.001	-1.91	.559	-3.033	-.785
safe form of power generation	Equal variances assumed	7.800	.005	-2.458	371	.014	-.67	.271	-1.197	-.133
	Equal variances not assumed			-3.232	66.966	.002	-.67	.206	-1.076	-.254
The positioning of solar panels does not affect the visual landscape	Equal variances assumed	.245	.621	-2.375	369	.018	-1.45	.609	-2.643	-.249
	Equal variances not assumed			-2.375	53.611	.021	-1.45	.609	-2.667	-.225

14.2 Comparison of Adoption statement responses (both surveys)

14.2.1 Cross tabulations of socio-economic groups and adoption statement responses (both surveys)

Table 164. Comparison of Adoption statements by Age category

Age * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	Advantage and Benefits most important: False	Total
Explorers	Age	18-35	3	1	4
		36-50	18	1	19
		51-65	12	1	13
		66+	7		7
	Total		40	3	43
Main	Age	18-35	40	5	45
		36-50	90	8	98
		51-65	116	7	123
		66+	71	4	75
	Total		317	24	341

Age * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	Only if it works with what I have: False	Total
Explorers	Age	18-35	1	3	4
		36-50	10	8	18
		51-65	9	3	12
		66+	3	4	7
	Total		23	18	41
Main	Age	18-35	28	15	43
		36-50	60	36	96
		51-65	94	28	122
		66+	66	9	75
	Total		248	88	336

Age * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	Too complex, likely to discourage: False	Total
Explorers	Age	18-35	3	1	4
		36-50	6	12	18
		51-65	8	4	12
		66+	4	3	7
	Total		21	20	41
Main	Age	18-35	26	18	44
		36-50	48	48	96
		51-65	88	35	123
		66+	50	21	71
	Total		212	122	334

Age * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	Age	18-35	1	3	4
		36-50	4	13	17
		51-65	2	10	12
		66+	2	5	7
	Total		9	31	40
Main	Age	18-35	25	19	44
		36-50	40	57	97
		51-65	81	41	122
		66+	55	18	73
	Total		201	135	336

Age * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	Age	18-35	2	2	4
		36-50	15	3	18
		51-65	9	3	12
		66+	4	3	7
	Total		30	11	41
Main	Age	18-35	42	3	45
		36-50	94	5	99
		51-65	122	2	124
		66+	71	4	75
	Total		329	14	343

Age * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	False	Total
Explorers	Age	18-35	3	1	4
		36-50	7	11	18
		51-65	4	9	13
		66+	4	3	7
	Total		18	24	42
Main	Age	18-35	10	34	44
		36-50	34	63	97
		51-65	36	84	120
		66+	32	40	72
	Total		112	221	333

Table 165. Comparison of Adoption Statements by Gender category.

Gender * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	Advantage and Benefits most important: False	Total
Explorers	Gender	Male	25	2	27
		Female	10	1	11
	Total		35	3	38
Main	Gender	Male	197	14	211
		Female	109	10	119
	Total		306	24	330

Gender * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	Only if it works with what I have: False	Total
Explorers	Gender	Male	12	14	26
		Female	8	2	10
	Total		20	16	36
Main	Gender	Male	151	57	208
		Female	89	28	117
	Total		240	85	325

Gender * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	Too complex, likely to discourage: False	Total
Explorers	Gender	Male	13	13	26
		Female	8	2	10
	Total		21	15	36
Main	Gender	Male	128	78	206
		Female	74	43	117
	Total		202	121	323

Gender * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	Gender	Male	4	21	25
		Female	4	6	10
	Total		8	27	35
Main	Gender	Male	128	81	209
		Female	67	49	116
	Total		195	130	325

Gender * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	Gender	Male	19	7	26
		Female	8	2	10
	Total		27	9	36
Main	Gender	Male	203	9	212
		Female	115	5	120
	Total		318	14	332

Gender * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	Knowing a product fits with my lifestyle is more important than trying it first: False	Total
Explorers	Gender	Male	9	17	26
		Female	7	4	11
	Total		16	21	37
Main	Gender	Male	67	139	206
		Female	41	75	116
	Total		108	214	322

Table 166. Comparison of Adoption statements by House location

House location * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	Advantage and Benefits most important: False	Total
Explorers	House location	Urban	19	1	20
		Rural	21	2	23
	Total		40	3	43
Main	House location	Urban	260	14	274
		Rural	46	4	50
	Total		306	18	324

House location * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	Only if it works with what I have: False	Total
Explorers	House location	Urban	12	7	19
		Rural	11	11	22
	Total		23	18	41
Main	House location	Urban	198	71	269
		Rural	39	11	50
	Total		237	82	319

House location * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	Too complex, likely to discourage: False	Total
Explorers	House location	Urban	12	7	19
		Rural	9	13	22
	Total		21	20	41
Main	House location	Urban	175	94	269
		Rural	26	22	48
	Total		201	116	317

House location * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	House location	Urban	2	16	18
		Rural	7	15	22
	Total		9	31	40
Main	House location	Urban	160	110	270
		Rural	32	18	50
	Total		192	128	320

House location * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	House location	Urban	12	7	19
		Rural	18	4	22
	Total		30	11	41
Main	House location	Urban	263	12	275
		Rural	48	2	50
	Total		311	14	325

House location * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	Knowing a product fits with my lifestyle is more important than trying it first: False	Total
Explorers	House location	Urban	10	9	19
		Rural	8	15	23
	Total		18	24	42
Main	House location	Urban	86	180	266
		Rural	21	29	50
	Total		107	209	316

Table 167. Comparison of Adoption Statements by occupation category

Occupation * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	False	Total
Explorers	Occupation	Retired	15		15
		Senior management	3		3
		Professional	4	1	5
		Semi-skilled	14	1	15
		Not working	3	1	4
	Total		39	3	42
Main	Occupation	Retired	114	5	119
		Senior management	33	3	36
		Professional	47	7	54
		Semi-skilled	81	4	85
		Not working	12	2	14
	Total		287	21	308

Occupation * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	False	Total
Explorers	Occupation	Retired	8	6	14
		Senior management	1	2	3
		Professional	2	2	4
		Semi-skilled	7	8	15
		Not working	4		4
	Total		22	18	40
Main	Occupation	Retired	103	17	120
		Senior management	23	12	35
		Professional	31	21	52
		Semi-skilled	61	23	84
		Not working	13	1	14
	Total		231	74	305

Occupation * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	False	Total
Explorers	Occupation	Retired	10	4	14
		Senior management	1	2	3
		Professional	3	1	4
		Semi-skilled	4	11	15
		Not working	3	1	4
	Total		21	19	40
Main	Occupation	Retired	81	37	118
		Senior management	23	12	35
		Professional	30	22	52
		Semi-skilled	50	33	83
		Not working	8	5	13
	Total		192	109	301

Occupation * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	Occupation	Retired	2	11	13
		Senior management	1	2	3
		Professional	2	2	4
		Semi-skilled	3	12	15
		Not working	1	3	4
	Total		9	30	39
Main	Occupation	Retired	86	31	117
		Senior management	17	18	35
		Professional	27	25	52
		Semi-skilled	43	41	84
		Not working	9	6	15
	Total		182	121	303

Occupation * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	Occupation	Retired	10	4	14
		Senior management	1	2	3
		Professional	3	1	4
		Semi-skilled	12	3	15
		Not working	3	1	4
	Total		29	11	40
Main	Occupation	Retired	117	3	120
		Senior management	33	3	36
		Professional	50	4	54
		Semi-skilled	81	4	85
		Not working	15		15
	Total		296	14	310

Occupation * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	Knowing a product fits with my lifestyle is more important than trying it first: False	Total
Explorers	Occupation	Retired	6	8	14
		Senior management	1	2	3
		Professional	3	2	5
		Semi-skilled	4	11	15
		Not working	4		4
	Total		18	23	41
Main	Occupation	Retired	46	70	116
		Senior management	13	23	36
		Professional	14	37	51
		Semi-skilled	22	61	83
		Not working	5	9	14
	Total		100	200	300

Table 168. Comparison of Adoption statements by income category

Total Household income * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	Advantage and Benefits most important: False	Total
Explorers	Total Household income	0-14,999	9	1	10
		15-29,999	12	2	14
		30-49,999	7		7
		50,000+	6		6
	Total		34	3	37
Main	Total Household income	0-14,999	69	4	73
		15-29,999	100	6	106
		30-49,999	88	7	95
		50,000+	36	5	41
	Total		293	22	315

Total Household income * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	Only if it works with what I have: False	Total
Explorers	Total Household income	0-14,999	5	4	9
		15-29,999	7	6	13
		30-49,999	6	1	7
		50,000+	3	3	6
	Total		21	14	35
Main	Total Household income	0-14,999	61	12	73
		15-29,999	71	33	104
		30-49,999	71	22	93
		50,000+	30	11	41
	Total		233	78	311

Total Household income * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	Too complex, likely to discourage: False	Total
Explorers	Total Household income	0-14,999	3	6	9
		15-29,999	6	7	13
		30-49,999	6	1	7
		50,000+	3	3	6
	Total		18	17	35
Main	Total Household income	0-14,999	50	21	71
		15-29,999	60	43	103
		30-49,999	61	32	93
		50,000+	21	20	41
	Total		192	116	308

Total Household income * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	Total Household income	0-14,999	1	8	9
		15-29,999	1	11	12
		30-49,999	2	5	7
		50,000+	4	2	6
	Total		8	26	34
Main	Total Household income	0-14,999	57	17	74
		15-29,999	61	44	105
		30-49,999	52	39	91
		50,000+	14	27	41
	Total		184	127	311

Total Household income * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	Total Household income	0-14,999	8	1	9
		15-29,999	9	4	13
		30-49,999	6	1	7
		50,000+	4	2	6
	Total		27	8	35
Main	Total Household income	0-14,999	72	2	74
		15-29,999	105	2	107
		30-49,999	89	6	95
		50,000+	39	2	41
	Total		305	12	317

Total Household income * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	Knowing a product fits with my lifestyle is more important than trying it first: False	Total
Explorers	Total Household income	0-14,999	3	7	10
		15-29,999	7	6	13
		30-49,999	3	4	7
		50,000+	1	5	6
	Total		14	22	36
Main	Total Household income	0-14,999	31	40	71
		15-29,999	32	71	103
		30-49,999	23	70	93
		50,000+	17	23	40
	Total		103	204	307

Table 169. Comparison of adoption statements by adopters of cavity wall insulation

cavity wall insulation * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	Advantage and Benefits most important: False	Total
Explorers	cavity wall insulation	Yes	22	3	25
		No	17		17
	Total		39	3	42
Main	cavity wall insulation	Yes	260	14	274
		No	56	10	66
	Total		316	24	340

cavity wall insulation * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	Only if it works with what I have: False	Total
Explorers	cavity wall insulation	Yes	15	9	24
		No	7	9	16
	Total		22	18	40
Main	cavity wall insulation	Yes	200	69	269
		No	47	19	66
	Total		247	88	335

cavity wall insulation * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	Too complex, likely to discourage: False	Total
Explorers	cavity wall insulation	Yes	12	12	24
		No	8	8	16
	Total		20	20	40
Main	cavity wall insulation	Yes	170	99	269
		No	41	23	64
	Total		211	122	333

cavity wall insulation * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	cavity wall insulation	Yes	5	18	23
		No	4	12	16
	Total		9	30	39
Main	cavity wall insulation	Yes	168	102	270
		No	32	33	65
	Total		200	135	335

cavity wall insulation * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	cavity wall insulation	Yes	17	7	24
		No	12	4	16
	Total		29	11	40
Main	cavity wall insulation	Yes	264	11	275
		No	64	3	67
	Total		328	14	342

cavity wall insulation * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	Knowing a product fits with my lifestyle is more important than trying it first: False	Total
Explorers	cavity wall insulation	Yes	10	14	24
		No	8	9	17
	Total		18	23	41
Main	cavity wall insulation	Yes	92	175	267
		No	20	45	65
	Total		112	220	332

Table 170. Comparison of adoption statements by adopters of energy efficient boilers

energy efficient boiler * Advantage and Benefits most important * Data Group Crosstabulation

Count

Data Group			Advantage and Benefits most important: True	Advantage and Benefits most important: False	Total
Explorers	energy efficient boiler	Yes	16		16
		No	23	3	26
	Total		39	3	42
Main	energy efficient boiler	Yes	138	6	144
		No	176	18	194
	Total		314	24	338

energy efficient boiler * Only if it works with what I have * Data Group Crosstabulation

Count

Data Group			Only if it works with what I have: True	Only if it works with what I have: False	Total
Explorers	energy efficient boiler	Yes	9	7	16
		No	13	11	24
	Total		22	18	40
Main	energy efficient boiler	Yes	109	34	143
		No	136	54	190
	Total		245	88	333

energy efficient boiler * Too complex, likely to discourage * Data Group Crosstabulation

Count

Data Group			Too complex, likely to discourage: True	Too complex, likely to discourage: False	Total
Explorers	energy efficient boiler	Yes	10	6	16
		No	10	14	24
	Total		20	20	40
Main	energy efficient boiler	Yes	91	51	142
		No	119	70	189
	Total		210	121	331

energy efficient boiler * Not seen before, less likely to buy * Data Group Crosstabulation

Count

Data Group			Not seen before, less likely to buy: True	Not seen before, less likely to buy: False	Total
Explorers	energy efficient boiler	Yes	2	14	16
		No	7	16	23
	Total		9	30	39
Main	energy efficient boiler	Yes	88	56	144
		No	112	78	190
	Total		200	134	334

energy efficient boiler * Try it first, more likely to buy * Data Group Crosstabulation

Count

Data Group			Try it first, more likely to buy: True	Try it first, more likely to buy: False	Total
Explorers	energy efficient boiler	Yes	11	5	16
		No	18	6	24
	Total		29	11	40
Main	energy efficient boiler	Yes	139	5	144
		No	187	9	196
	Total		326	14	340

energy efficient boiler * Knowing a product fits with my lifestyle is more important than trying it first * Data Group Crosstabulation

Count

Data Group			Knowing a product fits with my lifestyle is more important than trying it first: True	Knowing a product fits with my lifestyle is more important than trying it first: False	Total
Explorers	energy efficient boiler	Yes	5	11	16
		No	13	12	25
	Total		18	23	41
Main	energy efficient boiler	Yes	55	87	142
		No	56	132	188
	Total		111	219	330

14.2.2 *Comparison of Means for the Adoption Statements between the two respondent groups (Non Parametric Tests).*

Table 171. Mann Whitney test between adoption statements

	Advantage and Benefits most important		Only if it works with what I have		Too complex, likely to discourage		Not seen before, less likely to buy		Try it first more likely to buy		Knowing a product fits with my lifestyle is more important than trying it first	
	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
early adopters	40	3	23	18	21	20	9	31	30	11	18	24
early majority	319	24	250	88	214	122	202	136	331	14	113	222

Ranks

	Data Group	N	Mean Rank	Sum of Ranks
Advantage and Benefits most important	Explorers	43	193.47	8319.00
	Main	343	193.50	66372.00
	Total	386		
Only if it works with what I have	Explorers	41	220.20	9028.00
	Main	338	186.34	62982.00
	Total	379		
Too complex, likely to discourage	Explorers	41	209.95	8608.00
	Main	336	186.44	62645.00
	Total	377		
Not seen before, less likely to buy	Explorers	40	252.48	10099.00
	Main	338	182.05	61532.00
	Total	378		
Try it first, more likely to buy	Explorers	41	232.78	9544.00
	Main	345	188.83	65147.00
	Total	386		
Knowing a product fits with my lifestyle is more important than trying it first	Explorers	42	173.71	7296.00
	Main	335	190.92	63957.00
	Total	377		

Test Statistics[a]

	Advantage and Benefits most important	Only if it works with what I have	Too complex, likely to discourage	Not seen before, less likely to buy	Try it first, more likely to buy	Knowing a product fits with my lifestyle is more important than trying it first
Mann-Whitney U	7373.000	5691.000	6029.000	4241.000	5462.000	6393.000
Wilcoxon W	8319.000	62982.000	62645.000	61532.000	65147.000	7296.000
Z	-.005	-2.404	-1.554	-4.482	-5.594	-1.169
Asymp. Sig. (2-tailed)	.996	.016	.120	.000	.000	.242

a. Grouping Variable: Data Group