

# **Ashton Hayes Going Carbon Neutral:**

**Motivators and barriers to successful public participation in community-based carbon reduction programmes.**

**Gerard Joseph Edwards**

**September 2007**

**F85071 Climate Change and Sustainable Development (MSc)**

**ENGT5304-2007-X Dissertation**

**Institute of Energy and Sustainable Development**

**Computing Sciences & Engineering**

**De Montfort University: Leicester**

## **Preface**

I would like to acknowledge and to thank the following people who have helped me to undertake and complete this research:

### **De Montfort University: Leicester**

My supervisor Rob Wall for his invaluable encouragement, guidance, support and time, Greig Mill and also other members of staff, researchers and fellow MSc students at the Institute of Energy and Climate Change at De Montfort University.

### **In Ashton Hayes:**

The Team of the Ashton Hayes Going Carbon Neutral Project for their inclusiveness and support and in particular:

- Professor Roy Alexander and his staff at University of Chester for allowing me access to the 2006 Project Baseline study, the 2007 follow-up study and for including in the latter questions for the second half of this research. Moreover, his generous, painstaking and encouraging advice and support has been a valuable thread throughout this work.
- Garry Charnock for enabling and encouraging my involvement in the Project,
- Hugo Deynem: Chairman and the Parish Council of Ashton Hayes for their support for the research,
- Barry Cooney: Landlord of The Golden Lion for the donation of a meal for two to encourage NPs to take part,
- Tracey Todhunter for the cups of tea in a warm house during the first wintry research phase,
- The residents of Ashton Hayes who gave so generously of their time in completing the research,

- John Beckwith, Matthew Key, Sam Rowlett and Trudy Waters who are the research students of University of Chester who assisted with the completion of the second stage of the research from May to June 2007.

I would like to thank especially:

- Dr Clive Baldwin, University of Bradford for his painstaking advice and assistance.
- Most of all my wife Tess for her enduring support and patience, and
- our children Caroline, Joseph and Anna who helped me post the introductory letters on a cold January afternoon.

## List of contents

Preface .....	1
List of contents.....	3
List of acronyms.....	6
List of figures.....	7
List of tables.....	8
List of appendices .....	9
Abstract.....	10
Introduction .....	11
1.1    Ashton Hayes Going Carbon Neutral Project .....	11
1.1.1    Community participation in Ashton Hayes .....	12
1.2    Aims of the research.....	12
1.3    Objectives .....	13
1.4    Partnership agreement for the research .....	13
2    Literature review .....	14
2.1    Introduction.....	14
2.2    Motivation and barriers: psychosocial models of behaviour and their place in reducing CO2 emissions.....	14
2.3    Motivators and barriers .....	16
2.4    Barriers .....	17
2.5    Motivators for new EFBs.....	18
2.6    The role of a community in reducing CO2 emissions.....	22
3    Methodology .....	24
3.1    Introduction.....	24
3.2    “Participants” and “Non-Participants” .....	24

3.3	Surveying the “Non-participants” (NPs) .....	25
3.3.1	Research methods .....	25
3.3.2	Identifying the sample.....	25
3.3.3	Designing the questionnaires .....	26
3.4	Method of delivery .....	27
3.5	Participants (Ps) .....	27
4	Findings .....	28
4.1	Survey on “Non Participants” (NPs).....	28
4.1.1	Non-participation? .....	28
4.1.2	The effect of interest in climate change and EFBs and the Project’s role .....	29
4.1.3	The influence of the local community and others on NPs’ EFB .....	30
4.1.4	Ashton Hayes Primary School.....	32
4.1.5	What are the NPs doing to address climate change?.....	33
4.1.6	Other barriers .....	37
4.1.7	Section A questions and Section B demographic data.....	38
4.1.8	Psychological theory analysis.....	47
4.2	Survey of “Participants” (Ps).....	58
4.2.1	Individual findings .....	58
4.3	Comparing the NPs and Ps surveys .....	67
5	Conclusions .....	71
5.1	Conclusions from the findings.....	71
5.2	Theory analysis .....	73
5.3	Methodological conclusions.....	74
5.4	Conclusions .....	76
5.4.1	Limitations of use for the research.....	76

6	Recommendations.....	77
6.1	Theoretical framework .....	77
6.2	Communication.....	77
6.3	Different age groups .....	78
6.4	Project methodology .....	79
7	References .....	80
8	Bibliography .....	86
9	Appendices.....	88
9.1	Appendix 1: Map of Ashton Hayes in UK.....	88
9.2	Appendix 2: Map of Ashton Hayes .....	89
9.3	Appendix 3: Questionnaire for “non-participants” .....	90
9.4	Appendix 4: Questionnaire for “participants” .....	96

## List of acronyms

DEFRA	UK Government Department of the Environment, Food and Rural Affairs
EFB(s)	Environmentally-friendly behaviour(s)
GCNP	Ashton Hayes Going Carbon Neutral Project
NEP	New Ecological Paradigm
NPs	“Non-participants”, the group of people who prior to the research had not taken part in the Project’s organised activities or completed a baseline questionnaire in June 2006.
Ps	“Participants”, the group of people who prior to the research had taken part in the Project’s organised activities or completed a baseline questionnaire in June 2006.
The Project	Ashton Hayes Going Carbon Neutral Project
TIB	Theory of Interpersonal Behaviour
TPB	Theory of Planned Behaviour

## List of figures

Figure1	Value-Belief-Norm theory of pro-environmental behaviour (Stern et al 1999)	14
Figure 2	Triandis' Theory of Interpersonal Behaviour (1977)	16
Figure 3	Ashton Hayes Going Carbon Neutral Project's operations within the village	24
Figure 4	Interest in climate change and number of EFBs among NPs	28
Figure 5	"I have a close relative/friend keen on environmentally-friendly behaviour"	31
Figure 6	No. of households engaged in specific EFBs (related to household energy consumption and transport-related CO2 emissions)	33
Figure 7	Savings curve for CO2 abatement	36
Figure 8	Box plot of number of EFBs and adults aged under and over 60 years	40
Figure 8	Educational background of NPs	41
Figure 10	Ashton Hayes carbon footprints 2006: tonnes CO2 emitted per housing type	42
Figure 11	Ashton Hayes carbon footprints 2006: % of CO2 emissions per housing type	43
Figure 12	NPs' house type and Number of EFBs now	44
Figure 13	Occupation (retired and employed) and no of EFBs	45
Figure 14	Box plot of Cost of being more environmentally-friendly and occupation	46
Figure 15	The Theory of Planned Behaviour (Ajzen, 1991)	50
Figure 16	Occupation and cost as a deterrent to further EFBs	66



## List of tables

	<b>Title</b>	<b>Page</b>
1	Barriers and motivators to participation and related theories	25
2	I am interested in Climate Change and Because of Project we are now undertaking new environmentally-friendly activities	29
3	Households engaged in community activities which brought them into contact with the Project and responses to questions A4 - A15	30
4	Curtailment processes & Energy efficiency measures	34
5	Groupings of nos. of EFBs and I/my household knows what to do about climate change	35
6	No. of EFBs now and "I would like to do more EFB but I tend not to because I've got other more pressing or important things to deal with."	37
7	The cost of being (more) environmentally-friendly puts us off	38
8	Age of respondents and a number of variables	39
9	University and professional study and other educational background against range of variables	42
10	House type among NPs	43
11	Number of EFBs now and Occupation	45
12	Theories and questions	47
13	Groupings of nos. of EFBs and Respondent is involved in community activities	48
14	Groupings of nos. of EFBs and Another resident is involved in community activities	48
15	Other things are more important/I am too busy and climate change is exaggerated	50
16	Other things are more important/I am too busy and I feel preached at about climate change and I don't like it	51
17	Dangers of Climate Change are exaggerated and Number of EFBs now	53
18	Number of EFBs performed by classifications of question 11	53
19	Curtailment processes (repeated) and Classification of response to question 11: "The dangers of climate change are exaggerated."	54
20	Energy efficiency measures (1-off) and Classification of response to question 11: "The dangers of climate change are exaggerated."	54
21	I have a green friend and statistically significant variables	54
22	Because of Project now new environmentally-friendly activities * I feel like I'm being preached at and I don't like it"	56
23	Theories and questions: Ps survey	59
24	I feel proud of Ashton Hayes because of the Project/range of variables	61
25	The Project linked me to the village & Ps' educational background	62
26	Occupation and need for information to act (further) to address climate change (Grouping Variable: P: job retired other)	63
27	"I don't do (more) "environmentally-friendly" things because "I have other more pressing or important things to attend to."/ "I'm in a routine - I've always lived this way."	64
28	Comparing variables between NP and P samples	68

## **List of appendices**

Appendix 1 Map of Ashton Hayes in the UK

Appendix 2 Map of Ashton Hayes

Appendix 3 Non-Participant questionnaire

Appendix 4 Participant questionnaire

## Abstract

Ashton Hayes, a rural village of 350 households in Cheshire, UK, is aiming to become the first small community in England to achieve carbon neutral status (i.e. its carbon emissions are neutralised through energy reduction and carbon sequestration (<http://www.goingcarbonneutral.co.uk>) and initial indications are an estimated reduction of 20% has been achieved in 12 months. Jackson (2005: 134-5) notes the potential importance of such community-based initiatives as “effective avenues for exploring pro-environmental and pro-social behavioural change.” This research aims to identify the factors which facilitate and those which prevent participation in making such community carbon reduction projects successful so as to guide the Project and similar initiatives. It was drawn from two surveys: primary research with a quantitative questionnaire (January – March 2007) with 56 households which had not participated in the Project’s events or completed its baseline emissions questionnaire and secondary research with 91 households which had participated completing a quantitative questionnaire as part of the baseline update survey of June 2007.

While finding that almost all the village are engaged in environmentally-friendly behaviour (EFB), a range of motivating factors were at play including interest in climate change, EFB being perceived as a moral responsibility, saving money, encouragement from friends and family, being part of a community-based programme and being proud of Ashton Hayes. Barriers were chiefly householders’ busyness and unwillingness to prioritise new EFBs in the face of other pressing demands and cost (when people consider larger capital items). Households led by retired people were performing more EFBs than younger employed neighbours while people with higher education backgrounds are undertaking more EFBs than those without. The Project was found to be strengthening the community and producing take-up of new EFBs. Exploring a range of motivational theories, the author recommends that interventions underpinned by Social Capital Theory and Theory of Planned Behaviour should be pursued.

## Introduction

### 1.1 Ashton Hayes Going Carbon Neutral Project

The village of Ashton Hayes is in a rural setting six miles from the middle of Chester in the UK (see Appendix 1 and 2). The village has a population of 1,000 people living in 350 households. Recent housing development occurred mainly in the 1960s – 1980s when a series of large developments greatly increased the size of the village. The expansion has halted and both the stock and its population are now relatively stable.

In November 2005, Ashton Hayes Parish Council set up a sub group, the Ashton Hayes Going Carbon Neutral Project (“the Project”) under the leadership of one of its members as Project Coordinator with a small team of other volunteers.

The Project was launched in January 2006 at a public event attracting national media attention. The aims of the Project were identified as becoming, “the first small community in England to achieve carbon neutral status and to share this experience with other communities,” (Ashton Hayes Going Carbon Neutral Project, 2007). “Carbon neutral” is defined as involving “calculating your total climate damaging emissions, reducing them where possible, and then balancing your remaining emissions, often by purchasing a carbon offset; paying to plant new trees or investing in ‘green’ technologies such as wind or solar power,” (Alexander et al, 2007: 62 quoting New Oxford American Dictionary, 2006)<sup>1</sup>.

The Project attracted support not only from local residents but also local businesses, the University of Chester, the Local Authorities and from the Government in the form of a grant from DEFRA of £26,500 to support the

---

<sup>1</sup> In practice, only certain *direct* emissions, those over which the residents have direct control, are calculated. Other *indirect* emissions, e.g. emissions from non-residents’ cars passing through the village, are not included. See Alexander et al. (2007).

communication of the Project and enable other communities to follow such a course (Charnock, 2007). The Project has delivered a Conference for Small Communities and developed a toolkit for other communities' use.

With the support of the University of Chester, a student group conducted a baseline survey in May-June 2006 which estimated that the total emissions output in the village was 4,765.76 tonnes of CO<sub>2</sub> per year, (ibid, 2007). In May – June 2007 a new group of students from the University completed an update house-to-house survey to identify the impact of the Project thus far in terms of CO<sub>2</sub> reductions. Initial analysis indicates a 20% reduction in the 2006 baseline.

#### 1.1.1 Community participation in Ashton Hayes

Ashton Hayes has a strong community infrastructure with a large range of groups and activities (Alexander et al, 2007) based around a number of public buildings and institutions.

In addition to identifying barriers and motivators to participation in reducing CO<sub>2</sub> emissions, the potential for such a Project to strengthen links between individuals and groups and give a greater sense of pride, identity and ownership of a small community and so enhance the outcomes of the Project as well as the quality of their lives is of interest to the researcher. This led to an approach to the parish Council to conduct this research project.

### 1.2 Aims of the research

1. To identify factors underpinning successful participation in a community in its attempts to go “carbon neutral” and factors hindering participation.
2. To make recommendations to facilitate community participation in carbon neutral Projects.

### **1.3 Objectives**

1. To acquire data on participation rates among the village community of Ashton Hayes.
2. To identify factors influencing local residents to participate and not to participate in reducing carbon emissions
3. To make use of these data to:
  - a) promote participation in Ashton Hayes
  - b) assist in developing a model to promote participation in other communities.

### **1.4 Partnership agreement for the research**

An agreement was reached to conduct the research independently of the Project but with the full cooperation of both the Project and Parish Council and the University of Chester facilitated through Professor Roy Alexander: Department of Geography and Development Studies. The research was underpinned by terms of reference and an ethical data sharing agreement between the researcher, the University of Chester, the Project/Ashton Hayes Parish Council and De Montfort University: Institute of Energy and Sustainable Development.

## 2 Literature review

### 2.1 Introduction

As Ashton Hayes is the seeking to become the first village in the UK to become carbon neutral, there is little published research on such community projects.

### 2.2 Motivation and barriers: psychosocial models of behaviour and their place in reducing CO<sub>2</sub> emissions

A large body of work exists on motivation and barriers to action in terms of both environmentally-friendly behaviour (EFB) and (sustainable) consumption. A range of social and psychological theories have been examined which could be relevant to both the Project's work and wider efforts to reduce CO<sub>2</sub> emissions. These are explained and evaluated by Jackson (2005). A small selection of these theories follows.

Stern's VBN model (2000) highlights the staged development and the importance of values, beliefs and norms which underpin individual behaviour:

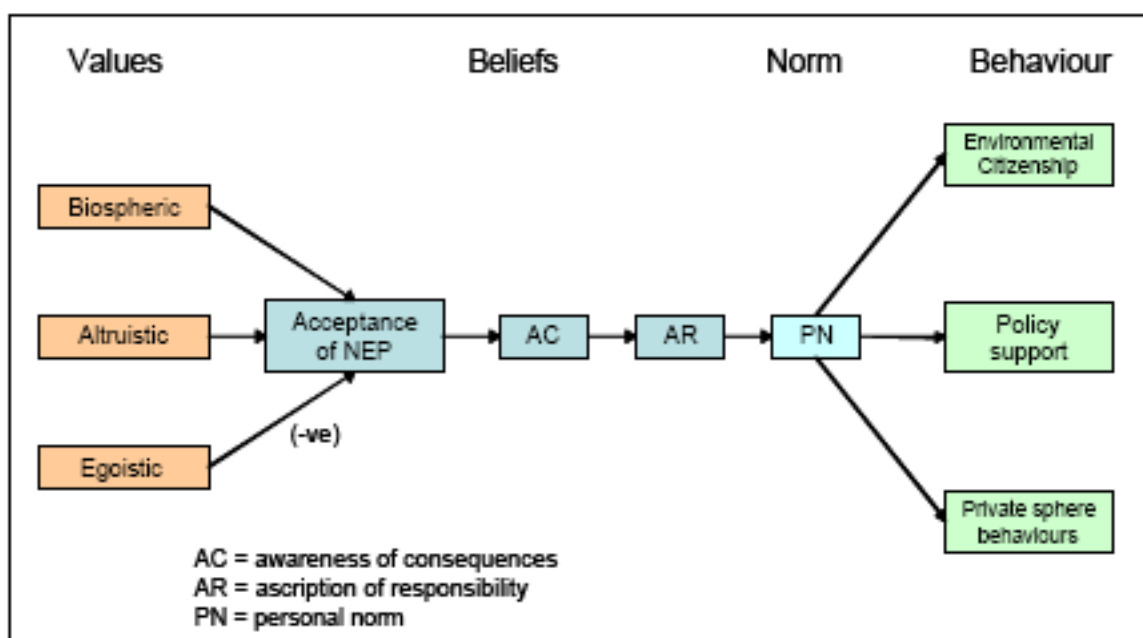


Figure 1: Value-Belief-Norm theory (Stern et al 1999) of pro-environmental behaviour

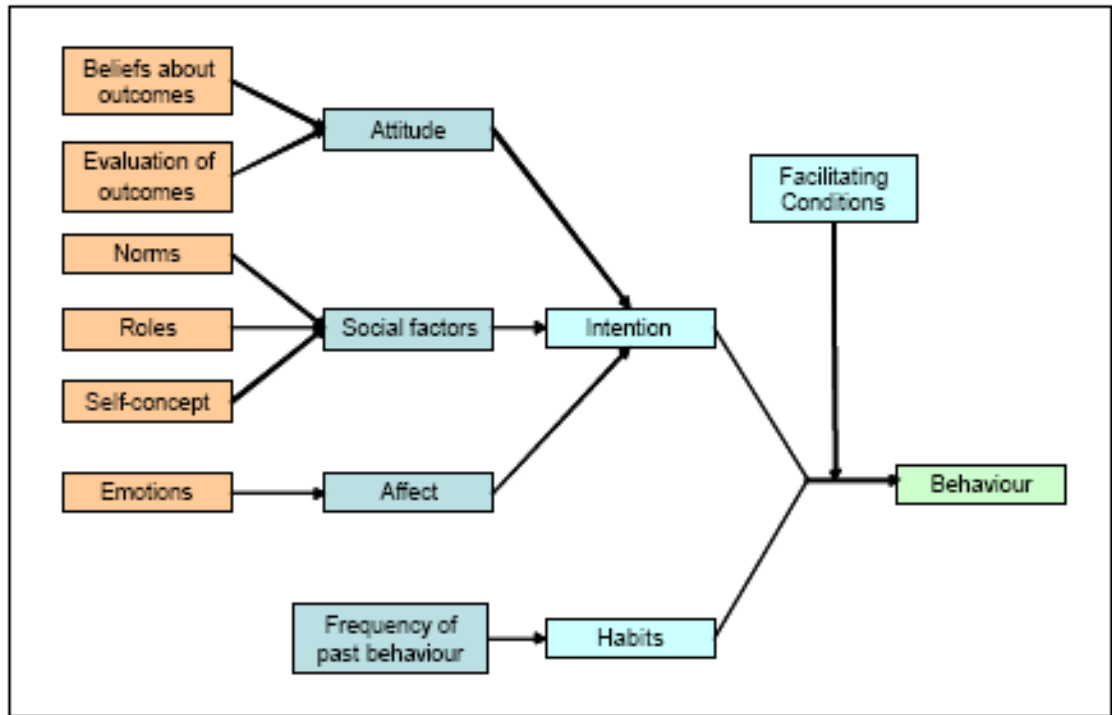
This model has since been further elaborated by Stern (2005) in a paper in which he states that psychological theory will provide only part of the underpinning knowledge enabling policy makers and local activists alike to promote more EFB.

He draws attention to the fact that consumption is due to much more than individuals' psychology but the discipline of social psychology (at an individual, organisational and group level) has an important part to play: "Some personal choices determine the environmental impact of many future behaviours and US households account for nearly 50% of CO<sub>2</sub> emissions," Stern, 2005:7)<sup>2</sup>. The fact that US\$440 bn. was spent in 1998 alone on advertising (IPCC, 1998) indicates the importance attached to individual consumerism, whether we are acting alone, in groups or within larger organisational structures. Guagnano et al (1995) found that sustainable consumption can be successfully encouraged (e.g. by providing recycling bins where inconvenience deters people from recycling) without getting individuals' to have pro-environmental attitudes first. Referring to Stern's ABC model (Attitudes (internal), Conditions (external) and Behaviour), they found that "attitudes are causal when conditions (non-psychological factors e.g. technological factors) are less extreme," (1995: 704). Thus external conditions "are expected to determine the efficacy of altruism," (ibid.: 707). However, as yet, there is no place in Stern's model for habitual behaviour which is not preceded by values and beliefs. Triandis (1977) attempted to address this issue in his Theory of Interpersonal Behaviour. He stated not only that habit, developed through frequency of past behaviour, plays a part in the choice of current and future behaviours but also that emotion (affect) precedes rational choice:

---

<sup>2</sup> Bin and Dowlatabadi (2005) estimate over 80% of the energy used and the CO<sub>2</sub> emitted in the US are a consequence of consumer demands and the economic activities to support these demands.





**Figure 2: Triandis' Theory of Interpersonal Behaviour (1977)**

Jackson draws attention to “the broad social and cultural context which is a powerful influence on attitudes and motivations,” (Jackson, 2005: 100). It is clear that the broader context in which we live plays a significant part in choice and conduct of chosen behaviours. It is therefore misleading and unhelpful to perceive behaviour as being solely at the discretion of individuals. In spite of our own best intentions, a consumer “lock-in’ occurs in part through the architecture of incentive structures, institutional barriers, inequalities in access, and restricted choice. But it also flows from habits, routines, social norms and expectations and dominant cultural values,” (ibid: vi). Jackson notes furthermore that the lack of control wielded by individuals is due to “consumption being also implicated in processes of identity formation, social distinction and identification, meaning creation and hedonic ‘dreaming’,” (ibid.: v, quoting Douglas, 1976).

### **2.3 Motivators and barriers**

Darnton’s (2004) summary report of studies on sustainable lifestyles identifies a number of barriers and motivators to EFBs. He makes the following initial observations: “Multiple barriers and drivers all impact on behaviour in combination.

Applying one driver or removing one barrier is not likely to result in significant numbers of people changing their behaviours, (p.16). Furthermore, “in different behavioural models, barriers are expressed differently: For example, sometimes they are shown to be internal and external to an individual while Stern refers to attitudinal or contextual issues. While some barriers are shown to be actual and some perceived, many are shown to be complex blends of both,” (ibid.). The following is a summary of Darnton’s findings in the areas he identified.

## **2.4 Barriers**

### *Low Level Behaviours*

Many everyday behaviours relating to sustainable consumption occur at low-levels of consciousness (for instance, energy use in the household, like boiling the kettle). Whether or not people are aware of their impacts, they are often barely aware they are undertaking behaviours involving active choices. Closely related to this are issues about routine behaviours/habits.

### *Norms and Habits*

Norms and habits can both drive or sustain behaviour changes. A habit is the term given by Darnton to routine behaviour acting as a barrier to more favourable EFB. Stern (2005) suggests routine behaviours have to be “unfrozen” before they can be made EFBs. Darnton (ibid.: 21) quotes Barr (2003) who noted the influence of the wider social context finding that the very act of leaving the green box out for kerbside collection places a social pressure on other residents to participate in recycling behaviour.

### *Convenience*

The perceived lack of convenience is often a major barrier to EFB. Lorenzoni and Pidgeon (2006) highlight that “although there is widespread concern about climate change, it is of secondary importance in comparison to other issues in people's daily lives.” Darnton quotes Shove (1999) who states that convenient acts are those for which the ends justify the amount of time expended to achieve them.

(ibid.: 19). Guagnano et al (1995) demonstrated that the removal of inconvenient barriers can produce EFB without there being an associated favourable attitude.

### *Cost*

Cost, particularly one-off purchase of environmentally-friendly items, is seen as a reason for not undertaking EFBs. Darnton's summary was that this is "a construct not an absolute" (Darnton: 21) relative to the person and individual situations. Burningham and Thrush (2001) found cost (along with struggling to cope with immediate problems rather than dealing with what was perceived as distant) to be a deterrent among low income households.

### *Psychological Effects*

Different people view the same behaviours differently. "Some people "discount' actions relating to environmental issues (e.g. where environmental problems are seen too remote from their daily lives), while others carry them out. Or, people often suggest that the (scientific) evidence on which claims for the importance of behaviour change rest is faulty and therefore some discount it (Stern, 2000)," (ibid.: 19).

### *Agency*

Darnton found that "not believing that one's own behaviour can make a difference is clearly a barrier to many sorts of ethical behaviour. People's undertaking of behaviours for sustainability is found to correlate with their reported sense of agency with low levels correlating with low levels of activity (e.g. quoting Brook Lyndhurst 2002; Barr et al 2003a), while people with higher educational qualifications – who recycle more – are shown to have a greater sense of agency (quoting Dawe July 2002)." (Darnton, 2004: 20).

## **2.5 Motivators for new EFBs**

### *Key influencers*

"Barr et al (2003b) suggest that the exerting of social norms is most effectively done through engaging key influencers to encourage the adoption of a particular

behaviour by a community,” (ibid.: 21). This approach lies at the heart of Diffusion Theory. In the research, key influencers could be one or more of:

- close friends/householders keen on EFB
- people whom householders had met in community activities in the village and, in particular,
- members of the project team

### *Groups*

Darnton reports on an extension of social influencing noting that “groups have a key role to play in supporting the adoption of behaviours for sustainability. Group working especially enables people with a lower sense of personal agency to undertake behaviour change and/or increase their levels of community involvement. As well as fostering a sense of the behaviour in question being seen as the social ‘norm’, group working can provide individuals with the support and information they need to change their behaviours, and maintain that changed behaviour until it becomes a habit,” (ibid.: 21-2).

### *Saving money*

Although actual and/or perceived high cost is a significant barrier to uptake of EFBs, on the other hand, cost saving is a significant motivator. However, the money to be saved must be deemed worth the effort of the behaviour and the initial outlay will be seen as worthwhile as long as the cost over and above a cheaper alternative can be recovered over a relatively short space of time. This point is cited in relation to installing solar panels by Darnton (quoting Brook Lyndhurst, 2003). The technology is not straightforward: In terms of improving the energy efficiency of existing households in Ashton Hayes through insulation, large variations in cost, energy saving potential and the value of externalities have a significant impact on the relative cost effectiveness of these measures,” (Gaterell and McEvoy, 2005).

Darnton records that of the 40% of respondents in the DEFRA Quality of Life survey (2001) who said they had cut down their household energy use on a regular basis, 81% had done so to save money and only 15% did so to help the

environment/reduce pollution.” (ibid.: 30). Energy conservation motivated by saving money also featured in Burningham and Thrush’s findings (2001).

### *Information*

Lowe et al (2006) found that many viewers of the film, “The Day after Tomorrow” expressed strong motivation to act on climate change. However, they noted that, “the public do not have information on what action they can take to mitigate climate change,” and this recalls Holdsworth’s (2003) findings that “most consumers show they do not know how to behave sustainably.”

The challenge for policymakers (and for the Project) in “a message-dense environment” (Jackson, 2005: xi) is to cut through the mass of information with targeted messages. The provision of practical information is however regarded as a key element in behaviour change campaigns by several sources. Darnton (quoting Hobson, 1999) recommends adopting a model which “provides information answering people’s own questions over a sustained period of time and enables participants to measure their own behaviours, and to consider them through informed debate with others,” (ibid.: 25).

The Project in Ashton Hayes is addressing this by providing personal feedback on CO<sub>2</sub> reduction measures to each participant household and by providing detailed practical advice (also recommended by Darnton and by Gillespie, 2005) on steps villagers can take (even down to the basic level of train and which shops stock particular materials), which is provided by local people who are non-experts and who are therefore seen to be more trustworthy thus addressing some scepticism and suspicions of bias. Nicholson-Cole (2005) suggests presenting information in an interactive digital fashion: “Meaningful visualisations using computer-aided visualisation could help to bridge the gap between what may seem an abstract concept and everyday experience, making clearer its local and individual relevance.”

### *The Role of Government*

Research sources commonly reveal most of the public to be cynical about the role of government in driving such changes. People tend to call for the government to take a lead on such issues (Darnton, 2004: 25).

### *Concern about Climate Change*

Urry (1995) (in Alexander et al, 2007: 72) notes that environmental concern appears most marked amongst those with non-manual occupations, and especially those doing professional-managerial work." Using house ownership/occupation as a means of assessing this finding in Ashton Hayes in 2006, Alexander et al found this to be true.

Bamberg's (2003) study into the role that general environmental concern plays in determining EFBs indicates that such concern, including perhaps an interest in climate change examined in the NP survey, is an "important indirect determinant of specific EFBs but has no direct influence on intention or behavior (quoting e.g. Weigel, 1983; Hines et al 1986/87; Spada, 1990; Six, 1992; Schahn, 1993, Eckes and Six, 1994, Fuhrer, 1995)," (30). Rather, "it influences the definition of a specific situation which is the generation of situation-specific cognitions," (ibid., 21). Drawing on TPB, most interestingly, Bamberg found that those the intentions of those students in his study expressing high levels of environmental concern was determined mainly by control-related cognitions, whereas the intention of low concerned students is mainly determined by social-norm-related cognitions," (30).

Darnton notes the following in his summary of other factors relating to motivation and barriers to EFBs.

### *Class distinctions*

Darnton found that people with higher incomes reported higher levels of pro-environmental concern than others but these households used more energy than other similarly-sized households. While income data was not part of the Ashton Hayes baseline study, the Project team also found that people in detached houses

emitted most CO<sub>2</sub> (consumed most) of the village household types (Alexander et al, 2007: 68).

#### *Age: Older People*

Darnton found that older people are reported to have more positive attitudes towards reusing behaviours (Darnton, 2004: 28).

#### *Travel*

Holdsworth (2003) found that all respondents who were drivers regarded car use as essential. Gatersleben and Uzzell (2003) in Guildford found that “50% of respondents stated that they would be willing to reduce their car use, but only 43% of respondents thought it would be possible for them to do so,” (in Darnton, 2004: 32). On air travel, (ibid.: 33-4), Bedford (2003) found her respondents reluctant not to travel by air when it is essential for holiday travel.

#### *Willingness to act*

It is worth noting that some sources note a discrepancy between what people say they do and what they actually do. Darnton (quoting Brook Lyndhurst, 2002) estimates that the rate at which people in research overclaim undertaking recycling may be as much as 10-20% (ibid.: 17).

#### *Moral responsibility*

Bamberg (quoting Stern et al., 1993 and 1995) relates how the environmental concern has been researched as one of a number of “morally tinged human concerns rooted in universal value,” (2003, 22) to identify its strength to motivate EFBs. Burningham and Thrush (2001) noted its presence among low income households but found it had little impact there. “I hate to bury our heads in the sand. You can't. Anyone with a blooming brain in their head can see what's happening. No one will be free of it.

## **2.6 The role of a community in reducing CO<sub>2</sub> emissions**

Jackson stresses the need “to raise behaviour from the level of practical to discursive consciousness” and notes that this process is known to be more

effective in a supportive, social environment (Jackson, 2005: xi). He notes the Government can influence behaviour through a change of policy in a number of ways and he includes helping communities to help themselves (ibid.: xii).

“Consumer behaviours are socially negotiated. Changing behaviour cannot be conceived as the processes of encouraging change at the individual level; pro-environmental behavioural change has to be a social process” and he calls upon the Government to act by “initiating, promoting and supporting community- led initiatives for social change,” (ibid.: 132).

Jackson’s concludes: “The role of community in mediating and moderating individual behaviours is clear. There are some strong suggestions that participatory community-based processes could offer effective avenues for exploring pro-environmental and pro-social behavioural change.... What is missing at present is unequivocal proof that such initiatives can achieve the level of behavioural change necessary to meet environmental and social objectives,” (ibid.: 134-5).

The Ashton Hayes Going Carbon Neutral Project is one such initiative. It remains to be seen whether it can achieve the level of behavioural change required to meet its own let alone unspecified Government aims. Meanwhile, the findings from the recent research into what motivated residents to reduce their CO<sub>2</sub> emissions and what acted as barriers follows.



### 3 Methodology

#### 3.1 Introduction

The researcher was unfamiliar with Ashton Hayes and conducted the research with the full support of the Project and Ashton Hayes Parish Council.

#### 3.2 “Participants” and “Non-Participants”

A “participating” (“P”) household is defined as one in which a household representative has attended one of the Project’s events or completed a baseline questionnaire. The other households are referred to as non-participants (“NPs”). Participation also has another meaning related to the aims of the Project. Households where people are taking steps to reduce its CO<sub>2</sub> emissions (whether it perceives its actions as such or not) are also perceived as participating. It is clear from the context which meaning is meant. An attempt to display the Project’s operations within the village is displayed below where the circles roughly refer to the size of the population in each category:

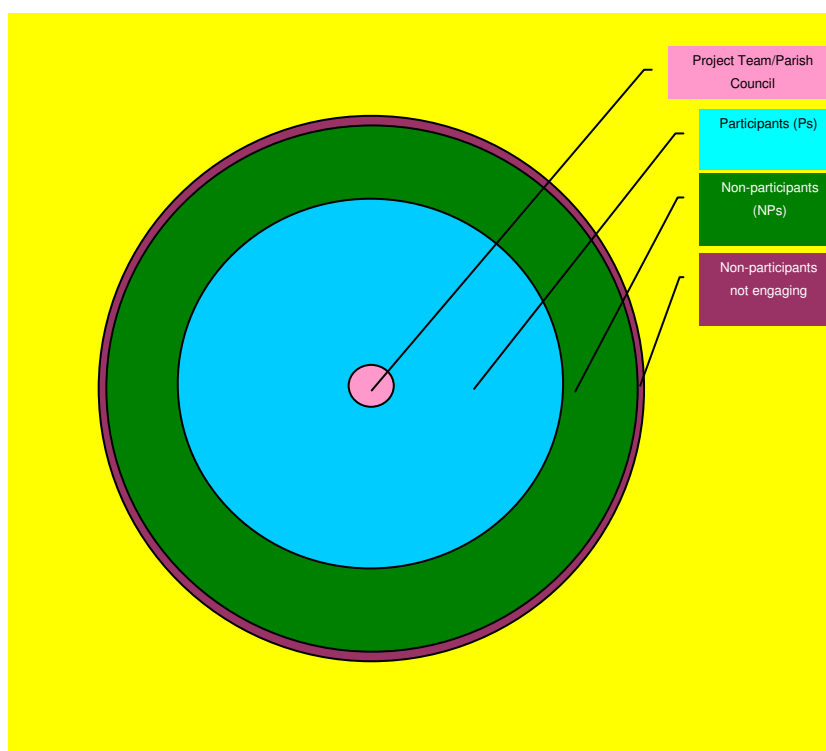


Figure 3: Ashton Hayes Going Carbon Neutral Project’s operations within the village.

### **3.3 Surveying the “Non-participants” (NPs)**

#### 3.3.1 Research methods

The method selected for both parts of the research was an ethnographic survey (Gladman et al, 2005). This fitted in with the University of Chester baseline survey data and allowed the targeting of specific households in a relatively short space of time. At the outset there was concern that, if people had not responded to a survey when approached by two students on their doorstep in the late Spring of 2006, would they be prepared to talk to one stranger in midwinter in sufficient numbers to draw reasonable conclusions? The use of a Focus Group was dismissed because of costs and a concern that people who had not participated thus far in the Project’s activities would not participate again.

A quantitative questionnaire was therefore devised and delivered by the researcher in person during weekend daylight hours when people who might normally be at work may be available who may have been unavailable to the students who had conducted the baseline survey in weekday office hours. To reassure residents of the bona fide nature of the research, the Parish Council Chairman produced an introductory letter which was hand delivered to the identified houses in the village on Sunday 14<sup>th</sup> January 2007 by the researcher and three excellent volunteers.

#### 3.3.2 Identifying the sample

Of the 350 households in the village, 181 had already taken part in one of the Project’s activities. Of the remaining 169 households identified for this survey, seven households were avoided on the advice of their neighbours who suggested that residents of the particular sheltered accommodation properties should not be disturbed, thus reducing the sample of possible households to 162.

56 NPs (16% of all households in the village and 33.14% of the NP households) were interviewed on a one-to-one basis by the researcher over four weekend days between January 20 2007 and March 15 2007. 18 people refused to answer the questionnaire with very few giving reasons for this.

### 3.3.3 Designing the questionnaires

It was decided that the questions would be framed in such a way as to test whether certain behavioural theories might be significant in determining motivation and barriers to participation in EFBs. This was a simple and crude mechanism aimed at informing the project's future interventions and providing the basis for more detailed research. Darnton's (2004) list of barriers and motivators formed the basis for developing this and, in addition to it, a number of other factors were examined relating to respondents' concern about Climate Change, community pride and reactance theory. The barriers and motivators explored with references to the questions used in the questionnaires (appendices 3 and 4) were as follows:

**Table 1: Barriers and motivators to participation and related theories**

<b>BARRIERS</b>			
<b>Darnton</b>	<b>NP questionnaire</b>	<b>P questionnaire</b>	<b>Theory</b>
Behaviours are too low-level for change		2a, 3a	<i>(Theory of Interpersonal Behaviour)</i>
Inconvenience	9	Too busy (3b)	Theory of Planned Behaviour
Cost	15	3f	Socio-economic
Psychological effects (e.g. discounting)	11	3e	New Ecological Paradigm
Agency - (the perceived capacity of a person to be an agent for change)	10	3c	New Ecological Paradigm
<i>Non-Darnton</i>	12	3g	Reactance
<b>MOTIVATORS</b>			
Key influencers	2, 13, 14	2e, 6	Diffusion/Social Capital
Groups	2	3h	Social Capital
Saving money		2b	Socio-economic
Information provision	4,5,8	3d	
Role of Government		2d	
Class (social/economic grouping)	20, 21	10,11	
Age	19		
Insulation	3		
Car travel	3		
Air travel	3		
<i>Non-Darnton: Concern about Climate Change</i>	7	2c	
<i>Non-Darnton: Pride in the community</i>		5	Social Capital

### **3.4 Method of delivery**

The researcher asked the questions (sharing a copy of the questionnaire with the NP if this was at all possible and where desired) and wrote the answers to achieve a greater consistency in reporting of the responses and to ensure that relevant and valuable detail was not lost. In Section A for the questions where the answers were in the form of a choice of more than one option (questions 4 – 13), a Likert scale was used. This was explained by describing the scale as “a spectrum running from strongly agree (1) through to strongly disagree (6).”

### **3.5 Participants (Ps)**

In May-June 2007 a Baseline Update survey was conducted by a second cohort of students from the University of Chester. This concentrated on the impact the Project had had in reducing people’s carbon footprint in the preceding 12 months. This survey was targeted at those who had participated in the 2006 Baseline Survey (a group of “participants”). For the purposes of the research reported here a quantitative questionnaire was inserted into the Baseline Update survey to gather data comparable to the ethnographic survey with NPs.

It was designed using similar (in some cases the same) questions as the NPs’ questionnaire but, as it came for the respondents at the end of another survey, it was shortened. In the end a very satisfactory sample of 91 respondents (26% of the village households) submitted a questionnaire.

## 4 Findings

### 4.1 Survey on “Non Participants” (NPs)

#### 4.1.1 Non-participation?

Respondents were asked to list their current environmentally-friendly behaviours (EFBs). Examples were given verbally if requested and the list of EFBs is not fully comprehensive. Despite the fact that those questioned had not participated in any of the Project’s events, all 56 stated they were regularly carrying out at least one EFB (the mean average number was 3.82 per household). Clearly, the term ‘non-participation’ in its everyday sense does not therefore apply to these Ashton Hayes residents as they are performing EFBs.

46 (82.1%) NPs were interested in climate change, a considerable proportion of the population. Figure 6 shows that those more interested were more likely to perform more EFBs. However, it also indicates, albeit with too small a sample to draw firm conclusions, that those who were not interested performed more EFBs than those who tended to be:

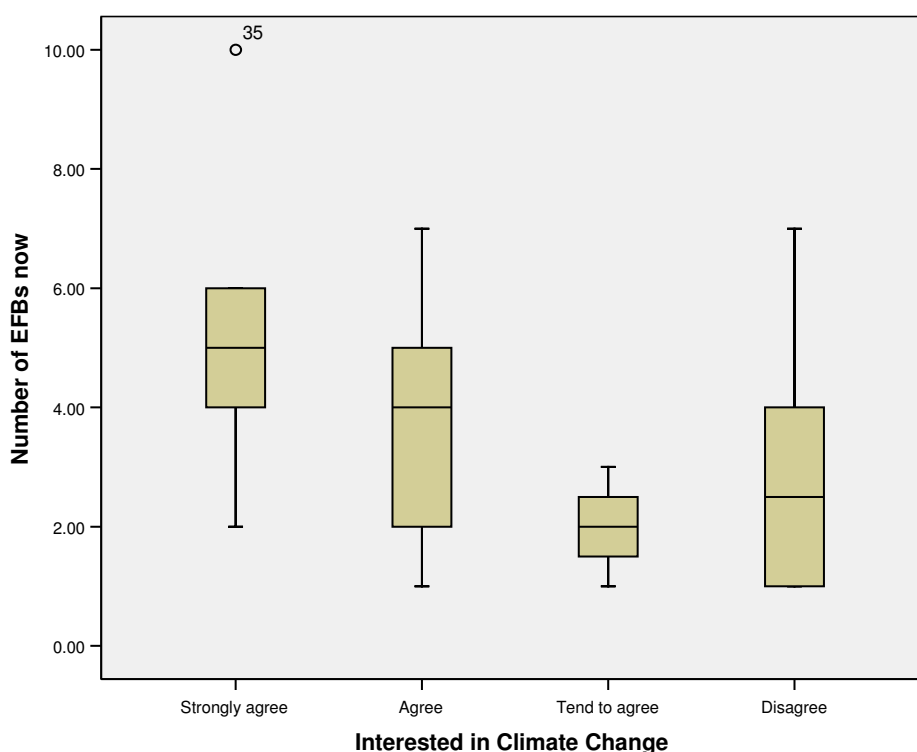


Figure 4: Interest in climate change and number of EFBs among NPs (n=56)

A Spearman's correlation confirms that there is a statistically significant relationship between the two variables *Interest in Climate Change* and *Number of EFBs* ( $\rho = -.414$ , sig: .002). It is not proved that their interest preceded the EFBs. However, while there is a link between people undertaking EFBs and interest in climate change, this finding may be an indication that *strength* of disinterest is not necessarily connected to the number of EFBs or their extent similar to the findings of Guagnano et al (1995).

The belief that respondents were making a difference through their EFB was another factor demonstrating motivation. There is a statistically significant relationship between their statements on making a difference and their interest in climate change (Spearman's  $\rho$ : .435 sig. (two-tailed): .001). When asked about whether they felt they were making a difference, typically respondents paused in the face of the climate change challenge and then asserted that they did make a difference and regularly gave responses such as, "everyone has to do their little bit," (Respondent 17) indicating that there is a widespread belief that action to address climate change has a moral flavour to it. Conversely, Adams (2007) reporting on a DEFRA (2007) study of 3,600 people highlighted that 25% of people say it is too much effort to undertake EFBs.

#### 4.1.2 The effect of interest in climate change and EFBs and the Project's role

Of the 56 NPs interviewed, only one was unaware of the Project. 20 (35.7%) said they were both aware of the Project *and* undertaking new EFBs because of it and an identical figure is the result of the correlation between awareness of the Project and undertaking new EFBs because of it. There is a strong statistically significant relationship between their interest in climate change and respondents engaging in EFBs because of the Project (Spearman's  $\rho$ : .414 sig. (two-tailed): .001). Table 2 indicates that interest in climate change is a motivator for environmentally-friendly behaviour:

**Table 2: I am interested in Climate Change and Because of Project we are now undertaking new environmentally-friendly activities: cross tabulation**

		Because of Project now new EFBs					Total
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	
Interested in Climate Change	Strongly agree	1	7	1	0	4	<b>13</b>
	Agree	0	9	1	1	22	<b>33</b>
	Tend to agree	0	1	0	0	3	<b>4</b>
	Disagree	0	0	0	0	6	<b>6</b>
Total		<b>1</b>	<b>17</b>	<b>2</b>	<b>1</b>	<b>35</b>	<b>56</b>

During the interviews, those engaged in EFBs regularly indicated that, while they were supportive of the Project, their commitment to EFBs and their interest in climate change predated its inception and therefore they disagreed that the Project had influenced their EFB. In addition, respondents may have been unable to distinguish the exact impact it had had in terms of generating new or indeed strengthening existing (to which several respondents referred). This highlights one of the problems with assessing the impact of the Project. Table 2 does not indicate the degree of impact the Project has had in terms of the number or extent of new EFBs. As noted above, pro-environmental attitude is not essential for EFBs if the conditions are favourable (Guagnano et al, 1995). For some, the interest will have strengthened EFB. Nevertheless, these results should encourage the Project team and indicate that the Project is having a greater effect on behaviour than merely NPs' being interested in climate change as people are reducing CO<sub>2</sub> emissions.

#### 4.1.3 The influence of the local community and others on NPs' EFB

38 (67.9%) households contained someone who was involved in a community activity. 16 (28.6%) respondents said that they or members of their household were regularly attending community activities which had brought them into contact with the Project. All (100%) of these respondents said that this contact had encouraged them to live in a more environmentally-friendly way in practice. While not a large sample and therefore conclusions should be treated with caution, a closer analysis of responses from these 16 respondents reveals:

**Table 3: Households engaged in community activities which brought them into contact with the Project and responses to questions A4 - A15**

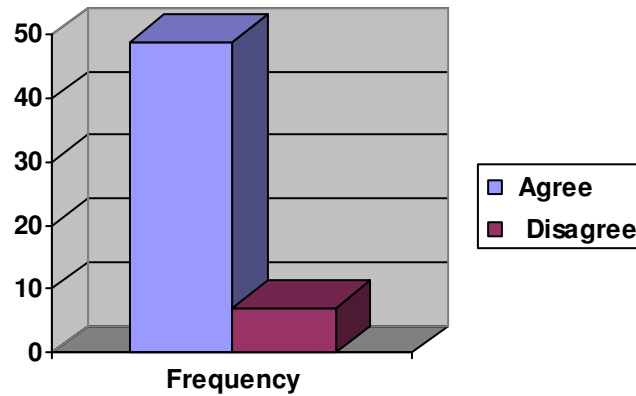
Number (n=16)	%	Finding
15	93.8	Were interested in climate change
14	87.5	Knew how to contact Project
13	81.3	Believed they were making a difference
13	81.3	Were not put off by the cost of further EFBs
12	75	Knew someone involved in the Project
10	62.5	Had started <i>new</i> EFBs because of the Project
11	68.8	Did know what to do about climate change
6	37.5	Were somewhat too busy or felt other things were perhaps more important
3	18.8	Thought the dangers of climate change were being exaggerated
4	25	Felt that they were often being preached at about climate change & didn't like it

With the caveat expressed above, these positive results should be welcome news for the Project. The 25% who felt that they were often being preached at about climate change & didn't like it were reacting to all influences on the subject rather than those solely from the Project. The mean average for this variable was 4.41 showing that most people disagreed with this view. One said, "I'd like to be more aware - I don't like the media sensationalising it."

For 15 of the 16 (93.8%) the interest in climate change was considerable and 13 (81.1%) believed they were making a difference and people appear to have been at least partially motivated to undertake more EFBs by these factors. Most pleasing for the Project team perhaps is that of those who have had contact with it through the community activities, 10 (62.5%) have engaged in new EFBs. This seems to indicate that working in this way with NPs is an effective way of reducing carbon emissions.

58.9% (33) respondents said they knew a member of the Project team, perhaps a further indication that the NPs are well connected within the village. In terms of having relationships which support EFB, 49 (87.5%) said that they had a friend or close relative who was keen on EFB:





**Figure 5: “I have a close relative/friend keen on environmentally-friendly behaviour”**

In fact, using Pearson Point Biserial correlation tests, there is a statistically significant relationship between a positive response to this question and not only the respondent being aware of the Project but also the respondent undertaking new EFBs because of it (Pearson  $r$  correlations .290: sig. (two-tailed) .015 (Spearman’s rho .290: sig. (two-tailed) .030), and .288: sig. (two-tailed): .032 (Spearman’s rho .288: sig. (two-tailed): .032) respectively). Furthermore, having such a friend is linked to respondents’ positive interest in climate change and to their knowing what to do to address the dangers of climate change (Spearman’s rho .270: sig. (two-tailed) .044 and .331: sig. (two-tailed): .013 respectively).

Any suggestions therefore that NPs did not engage in the Project’s activities either due to a lack of supportive friends/household members who are keen on EFB or due to a lack of connections with community activities in the village through which they could find out more about EFBs is shown to be false.

#### 4.1.4 Ashton Hayes Primary School

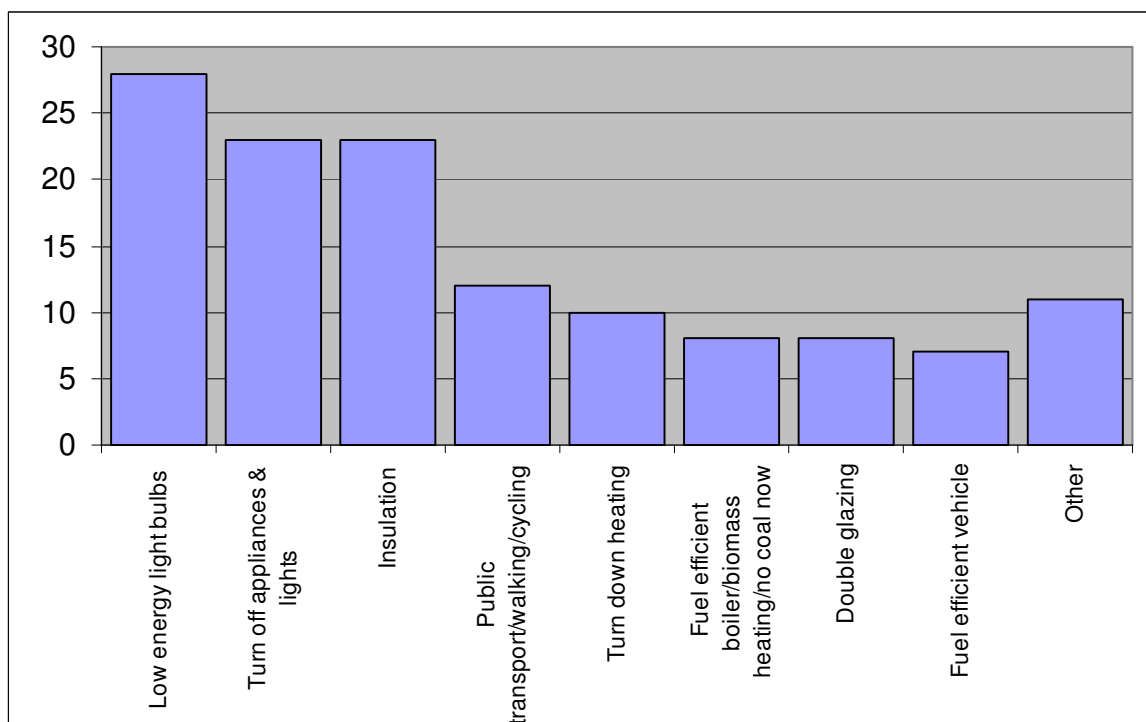
One community service has been a particular focus for the team in developing the Project and role played by Ashton Hayes Primary School has received much attention. The School has been deliberately chosen to be central in developing and conveying the messages about the Project in the village to young children

(Alexander, 2007) and the Project team is of the belief that the influence of pupils on their households in reducing CO<sub>2</sub> emissions is contributing significantly.

In this survey, only six households had links to the school making the validity of such conclusions impossible to assess. One parent said that her daughter was so concerned about the polar bears' loss of habitat through the melting of Arctic ice that that morning she had complained that her mother should not be baking her favourite cakes because of the carbon emissions it would generate (Respondent 18). Another said, "She's educating me!" (Respondent 30).

#### 4.1.5 What are the NPs doing to address climate change?

NPs were able to enumerate a list of EFBs they and their households were undertaking and time and the opportunity was given for people to respond as fully as they were able:



**Figure 6: No. of households engaged in specific EFBs (related to household energy consumption and transport-related CO<sub>2</sub> emissions)**

This shows that NPs were using established means to reduce their CO<sub>2</sub> footprints and were not going beyond a limited range of the common tried and tested technologies and practices. While this was expected, only three references were made to zero carbon technologies (biomass district heating and the use of renewable energy electricity production). A number of other potentially significant EFBs were unmentioned or appear not to have been adopted widely – for example, buying food locally and more locally produced food. This may indicate a lack of awareness about low carbon technologies and/or an unwillingness to adopt them due to a range of factors. Given the fact that the village is rural, cars were felt to be a necessity on a regular basis. For the NPs, there appears to be little in the way of reliable alternatives to this. It was also noticeable that a number of behaviours which were not particularly onerous to convert into EFBs such as composting (e.g. grass cuttings) were not mentioned more widely.

The list of EFBs may not have been exhaustive. 23 of the respondents (41.1%) mentioned that they had insulation installed in their property but it is unlikely, given the age of much of the housing stock that the remaining 58.9% of the sample lived in uninsulated properties.

Abrahamse et al (2005: 274) drew on two categories of household EFBs. “Efficiency behaviours are one-shot behaviours and entail the purchase of energy efficient equipment, such as insulation. Curtailment behaviours involve repetitive efforts to reduce energy use, such as lowering thermostat settings.” In this table, the highest scoring eight EFBs shown above have been divided into the two categories of curtailment and energy efficiency. The results indicate that 10 (17.9%) of the NPs are doing neither with 26 (46.4%) doing both:

**Table 4: Curtailment processes & Energy efficiency measures: crosstabulation**

		Energy efficiency measures (1-Off)		Total
		Energy efficiency measures (1 - off)	No energy efficiency measures (1 - off)	
<b>Curtailment processes (i.e. regularly repeated behaviours)</b>	Curtailment behaviours	26	8	<b>34</b>
	No curtailment behaviours	12	10	<b>22</b>
<b>Total</b>		<b>38</b>	<b>18</b>	<b>56</b>

This table does not include detail of how extensive each of the EFBs is within the household. Investment in one of the cheaper energy efficiency measures, low energy light bulbs (LELBs), has been made by 28 (50%) of the NPs<sup>3</sup>. For 23 (41%), reducing electricity consumption through turning off appliances and lights is established practice. However, greater reductions in CO<sub>2</sub> emissions can be achieved by turning down/off domestic heating and hot water and reducing travel by cars and planes. The survey was conducted between late January and mid March and people were perhaps less likely to be reducing heating demand in this period particularly with 24 (42.9%) households containing residents who were over 60 (see below) where the heating demand is presumably higher.

While these findings indicate that progress is being made, they also demonstrate that there is a great deal of work to be done by NPs to reduce CO<sub>2</sub> emissions to a point where the village will become carbon neutral.

In terms of knowing how to address climate change, there was a vein of confidence in the sample about how to act to reduce CO<sub>2</sub> emissions with 30 (53.6%) respondents saying they knew what to do. However, of the remaining 46.4% (26) who were less than sure, 26.8% stated categorically that they did not know what to do.

**Table 5: Groupings of nos. of EFBs and I/my household knows what to do about climate change: cross tabulation**

		"I/my household knows what to do about climate change"				Total
		agree	tend to agree	tend to disagree	disagree	
<b>Groupings of nos. of EFBs</b>	1 - 3 EFBs	13	4	4	7	<b>28</b>
	4 + EFBs	17	2	1	8	<b>28</b>
<b>Total</b>		<b>30</b>	<b>6</b>	<b>5</b>	<b>15</b>	<b>56</b>

---

<sup>3</sup> In the recent DEFRA survey (Adams, 2007), 75% of households were using some low energy light bulbs (31% in 2001).

This simplified table bears out the views expressed by those who were confident in their knowledge. Most of the EFBs is being conducted by those who know what to do but, interestingly, those who disagree are contributing to the Project's aim of becoming carbon neutral to a greater extent (in terms of the number of EFBs) than those who tend to agree and tend to disagree combined (15 and 11 respectively).

It is possible that the pattern of EFBs may reflect a lack of knowledge about which EFBs to pursue among the NPs and indeed a number of other possible factors. Toke and Taylor (2007) demonstrated the most effective methods of reducing CO<sub>2</sub> emissions in cost terms on a national scale:

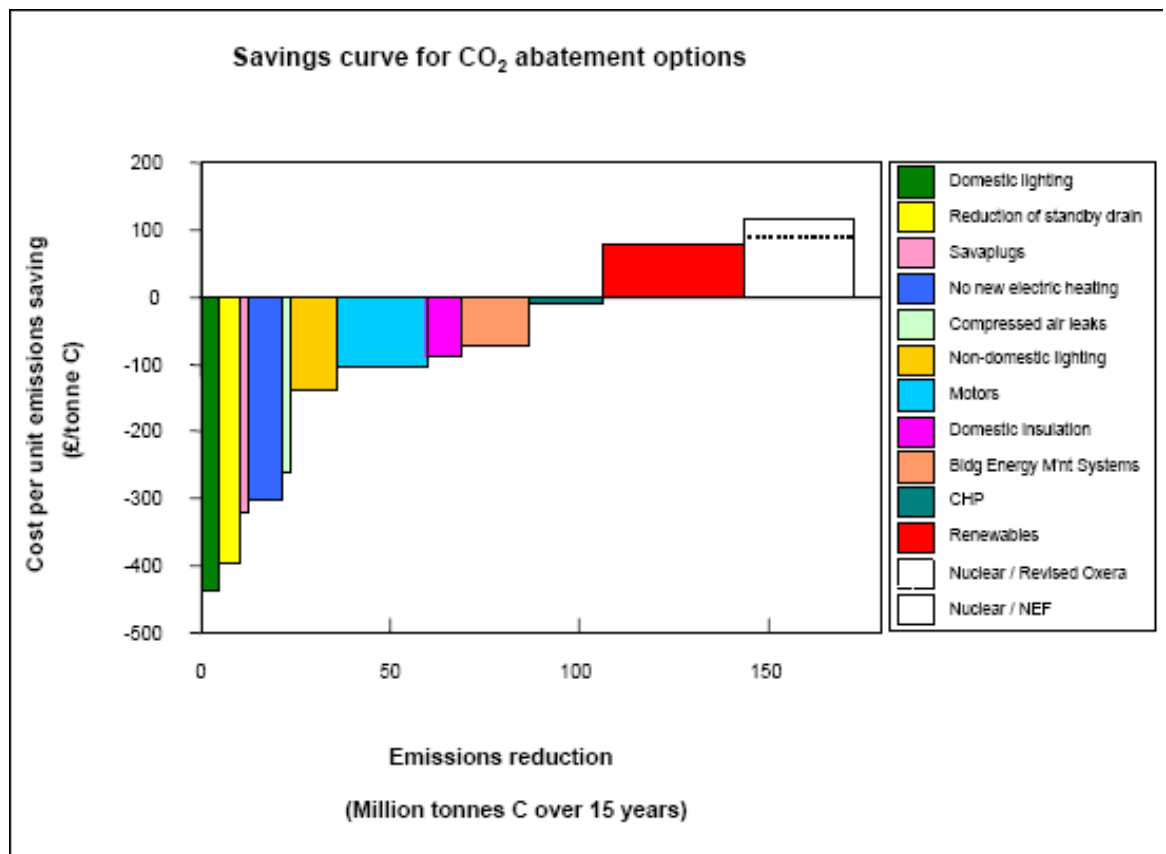


Figure 9: Savings curve for CO<sub>2</sub> abatement (Toke and Taylor, 2007)

Of those who chose to comment on other reasons why they do not get more involved with EFBs, 15 (50%) stated the need for more information. Comments

made in questions 17 and 18 regularly pointed to the need for more information which is practical, detailed and includes cost: benefit analyses. For example, “we need more education, simpler recycling (compartments in bins) and technical advice e.g. about coal/wood on a budget,” (Respondent 3)

#### 4.1.6 Other barriers

Apart from ignorance over what to do, what else may be deterring NPs from engaging in (more) EFB? For 30 respondents (53.6%), lack of time and the presence of what they see as more pressing or important things prevent them from taking further action despite the fact that they are interested in climate change. There is a statistically significant negative relationship between these two factors (Spearman’s rho  $-.432$ : sig. (two-tailed)  $.001$ ) and this bears out Shove’s (1998) findings (in Darnton, 2004).

**Table 6: No. of EFBs now and “I would like to do more EFB but I tend not to because I’ve got other more pressing or important things to deal with.” Cross tabulation**

“I would like to do more environmentally-friendly things but I tend not to because I’ve got other more pressing or important things to deal with.”										
No. EFBs now		Strongly agree	Agree	Tend to Agree	Total EFBs agreeers	Tend to Disagree	Disagree	Total EFBs disagreeers	Total NPs	Grand Total EFBs
	1	1	3	1	5	0	1	1	6	6
2	1	4	2	14	0	3	6	10	20	
3	1	2	1	12	2	3	15	9	27	
4	0	1	2	12	1	5	24	9	36	
5	0	4	1	25	1	3	20	9	45	
6	0	4	1	30	0	5	30	10	60	
7	0	0	1	7	0	1	7	2	14	
10	0	0	0	0	0	1	10	1	10	
<b>Total</b>		<b>3</b>	<b>18</b>	<b>9</b>	<b>105</b>	<b>4</b>	<b>22</b>	<b>113</b>	<b>56</b>	<b>218</b>

The table shows that those who strongly agreed that they were too busy or had other more important things to do did perform a lower number of EFBs. The opposite is true for the 22 (39.3%) who disagreed. However they performed 98 EFBs between them as opposed to the 18 (32.1%) who agreed that they were too busy who in fact performed 65 EFBs. Those with “tending” options performed many fewer. This does not indicate how regularly or extensively such EFBs were conducted. However, with only 39.3% indicating that they clearly disagreed with the statement, there remain 3/5ths of the NPs in the village to be convinced of the

importance of addressing climate change and reducing CO<sub>2</sub> emissions more in practice. On the other side, 16 (28.6%) of the NPs were at least unconvinced that the dangers of climate change were not being exaggerated at the time of the research. This question leaves open whether the respondents believed that human-induced climate change is occurring and also that there are any dangers arising from it.

#### *The cost of EFBs*

As identified by Darnton (2004), another potentially significant factor to deter people from engaging in the Project's aims is cost of EFBs. Some respondents were able to draw a distinction between cheap or no-cost EFBs and those which involved expensive capital investments and respondents were deterred by the latter improvements with very few exceptions. The survey design did not however distinguish between these two categories of expenditure. For over 75% of the NP population, cost was not a barrier to them engaging in further EFB. See the age section below:

**Table 7: The cost of being (more) environmentally-friendly puts us off:**

	<b>Frequency</b>	<b>%</b>
Agree	8	14.3
Tend to agree	5	8.9
Tend to disagree	6	10.7
Disagree	37	66.1
<b>Total</b>	<b>56</b>	<b>100</b>

Respondent 7 said, "I don't know what the cost is. It's too costly if you don't do anything. There's always a cost that someone has to pay. It's better to share it and then everyone can benefit."

#### 4.1.7 Section A questions and Section B demographic data

Respondents were asked for details of their gender, the age composition of the household, the respondent's educational background, their occupation, ethnicity, whether they classed themselves as disabled or not, and who owned the house in

which they were being interviewed. The house type was later added<sup>4</sup> as the Project team had found that this was a significant factor in the 2006 baseline study.

### *Gender*

By chance, the gender breakdown in the sample was almost evenly split with 30 men and 26 women answering the questionnaire. As expected, there was no significant difference in responses which could be linked to gender as expected.

### *Age*

A range of age groups were identified but so that reasonable sample sizes could be identified, the respondents, all adults, were divided into two age groups of 19 - 59 years (n=34) and those aged 60 and over (n=22):

**Table 8: Age of respondents and a number of variables (Mann-Whitney U test)**

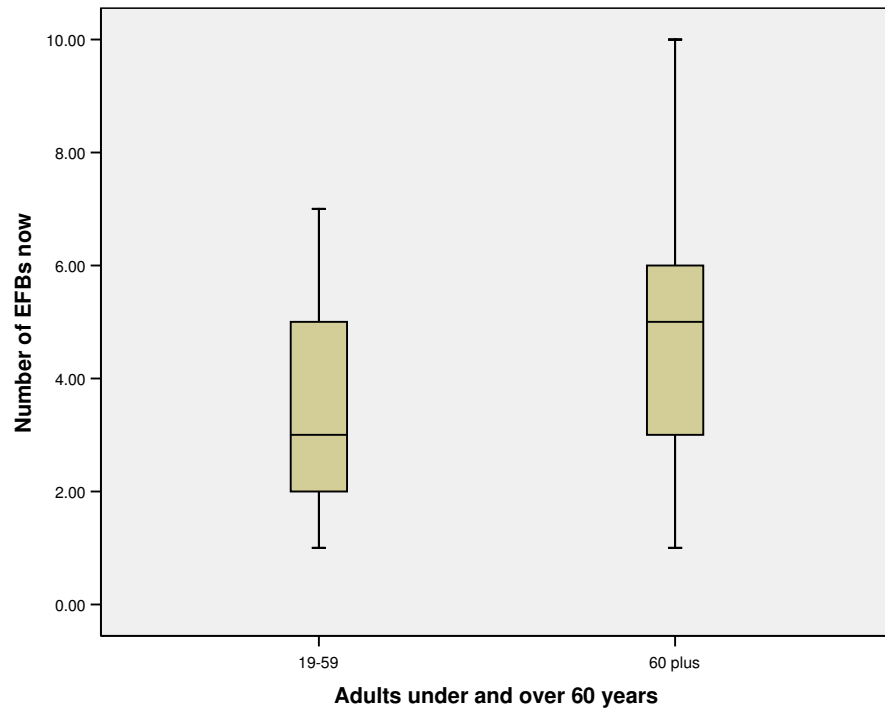
<b>Variable</b>	<b>Adults under and over 60 years</b>	<b>Mean Rank</b>	<b>Asymp. Sig. (2-tailed)</b>
Number of EFBs now	19-59	24.51	.021
	60 plus	34.66	
I know what to do to address the dangers of climate change	19-59	25.07	.031
	60 plus	33.80	

This table shows that older NPs perform more EFBs than their younger adult NP neighbours and those over sixty do more EFBs and (see below) have a wider range of EFBs than their younger neighbours:

---

<sup>4</sup> That is, detached house, semi detached house, detached bungalow, semi detached bungalow, mid terrace house, end terrace house and detached converted agricultural building.



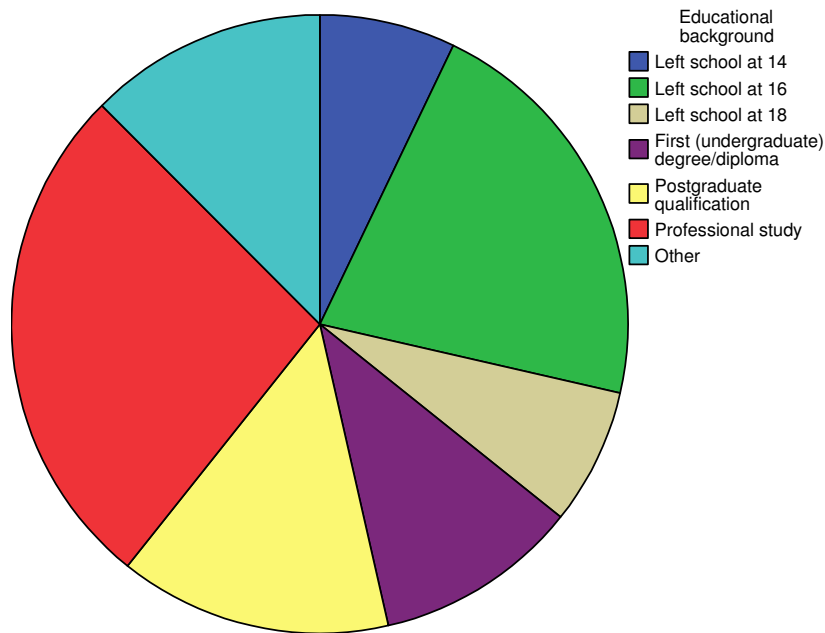


**Figure 8: Number of EFBs and adults aged under and over 60 years (boxplot)**

Furthermore there is a statistically significant relationship between being older and knowing what to do to address the dangers of climate change (Asymp. sig (two-tailed) .031).

#### *Educational background*

The educational background of the NP respondents encompassed those who left school at 14 and those with postgraduate and professional study careers:



**Figure 9: Educational background of NPs (n=56)**

Categorising educational background into two groups of respondents to ensure reasonable sample sizes allows a comparison of all respondents as 28 (50%) of the 56 respondents had received some form of higher education and/or engaged in professional study. Performing a Mann-Whitney U test (table 9) on this sample reveals five statistically significant results when compared to those without such a background:

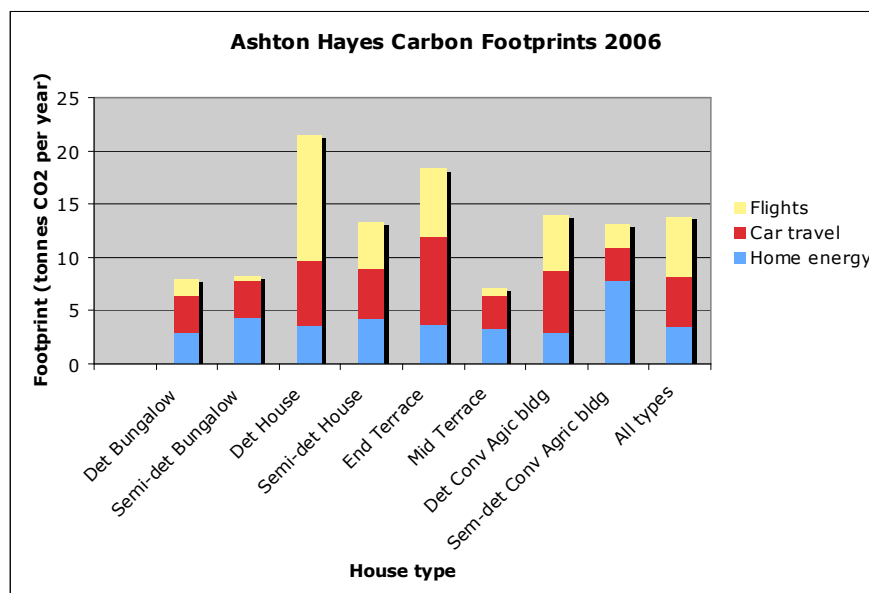
- This group performed most of the EFBs
- is more aware of the Project
- is more interested in climate change
- Other things are not seen as more important or the respondent too busy to engage in combating climate change
- They did not feel preached at about climate change nor dislike this:

**Table 9: University and professional study and other educational background against range of variables: Mann-Whitney U test**

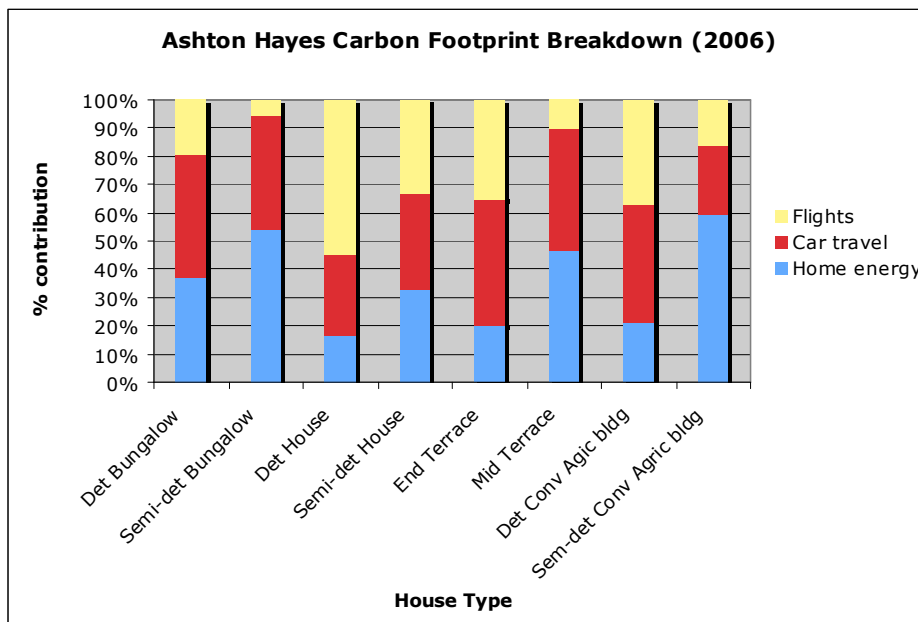
Variable	University & professional study and other educational background	Mean Rank	Mann-Whitney U Asymp. Sig. (2-tailed)
Number of EFBs now	Yes and professional study	33.39	.023
	Other	23.61	
Aware of the Project	Yes and professional study	24.57	.026
	Other	32.43	
Interested in Climate Change	Yes and professional study	24.11	.023
	Other	32.89	
Other things are more important/too busy	Yes and professional study	32.55	.050
	Other	24.45	
I feel like I'm being preached at and I don't like it	Yes and professional study	32.52	.036
	Other	24.48	

### *House types*

Alexander et al (2007) found there to be a relationship between housing types and the three main areas of consumption, home energy, car use and travel by aeroplanes. Those living in detached houses emitted the most and those in mid terrace properties the least CO<sub>2</sub>. A breakdown of the house type footprints can be seen within both of the following graphs. Firstly, tonnes CO<sub>2</sub> emitted per house type and secondly the percentage contribution each group of emissions made within each housing type:



**Figure 10: Ashton Hayes carbon footprints 2006: tonnes CO<sub>2</sub> emitted per housing type (Alexander et al, 2007)**



**Figure 11: Ashton Hayes carbon footprints 2006: % of CO<sub>2</sub> emissions per housing type (ibid.)**

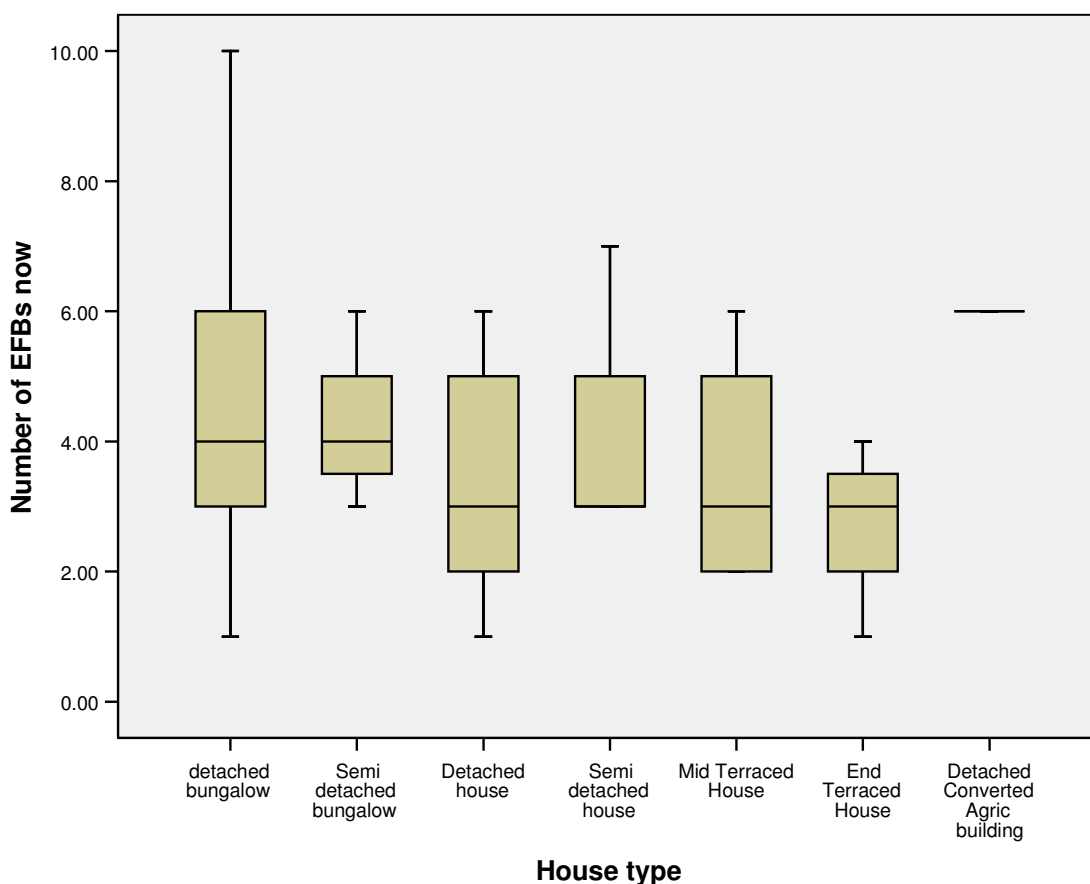
The progress made against these figures was the subject of the 2007 University of Chester Baseline Update Survey. However, a test of correlation of housing types among the NP respondents and a range of variables was conducted with the results being of interest.

**Table 10: House type among NPs (n=56)**

No	House type	Frequency	Valid Percent	Cumulative Percent
1	Detached bungalow	29	51.8	51.8
2	Semi detached bungalow	5	8.9	60.7
3	Detached house	11	19.6	80.4
4	Semi detached house	4	7.1	87.5
5	Mid Terraced House	4	7.1	94.6
6	End Terraced House	2	3.6	98.2
7	Detached Converted Agricultural building	1	1.8	100
	<b>Total</b>	<b>56</b>	<b>100</b>	

There are two samples of reasonable size which are interesting when comparing them with the 2006 baseline study. The Baseline showed that those in detached houses had the highest CO<sub>2</sub> footprint, mainly due to travel, and those in detached bungalows were the lowest. Of the two house types identified above, it can be seen below that people in detached bungalows were performing more EFBs (with

a median of 4 EFBs) than those in detached houses and there was a greater range and higher median number of EFBs reported. On average, NPs in detached houses in Ashton Hayes had similar rates of interest in climate change to NPs in detached bungalows:



**Figure 12: NPs' house type and Number of EFBs now (n=56)**

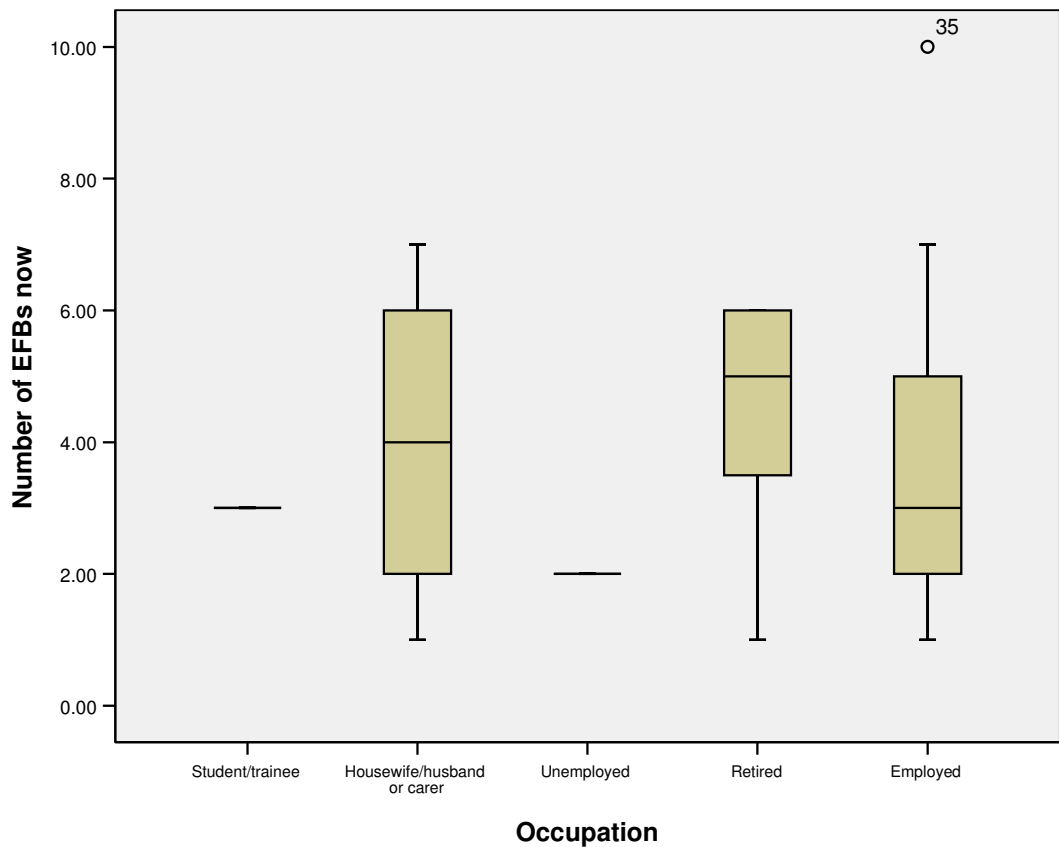
### *Occupation*

The majority of respondents can be divided into two groups, the 30 (53.6%) who were employed at the time and the 20 (35.7%) who were retired (table 11):

**Table 11: Number of EFBs now and Occupation: cross tabulation (n=56)**

		Occupation					Total
		Student/ trainee	Housewife/ husband or carer	Unemployed	Retired	Employed	
Number of EFBs now	1	0	1	0	2	3	6
	2	0	0	1	0	7	8
	3	0	1	0	3	9	13
	4	0	1	0	2	5	8
	5	0	1	0	5	4	10
	6	1	0	0	7	1	9
	7	0	0	0	1	0	1
	10	0	0	0	0	1	1
Total		1	4	1	20	30	56

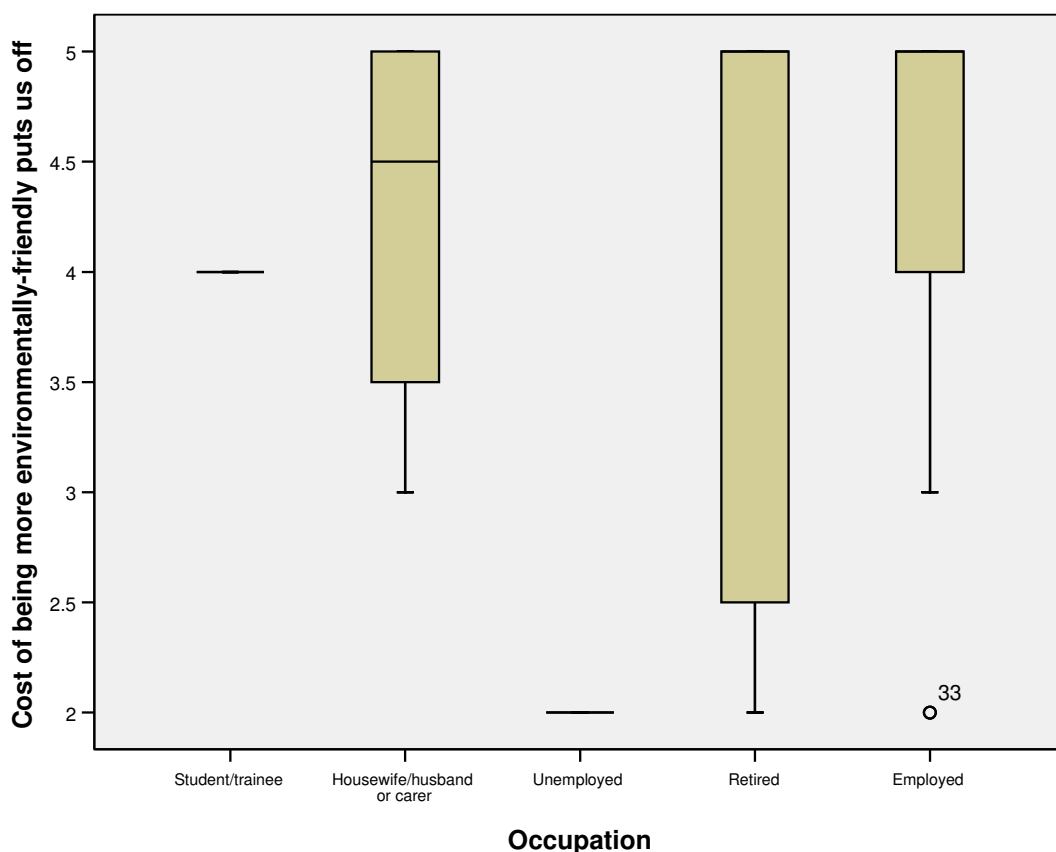
The box plot below shows that the retired population are conducting most of the EFBs with a higher range of activities and a median of 4.5 EFBs as opposed to approximately 3.5 EFBs for their working neighbours:



**Figure 13: Occupation (retired and employed) and no of EFBs (n=56)**

This reflects the age analysis detailed above very closely, indicating that it is at least as much of an age factor as one related to occupation. However, this

performance is in spite of the fact that there is greater concern about cost among the retired population. When asked if cost put them off from undertaking (more) EFBs, employed people in the main ranged from tend to disagree to agree. A considerable proportion of those who were retired were more concerned, as can be seen below, about cost and yet were engaged in more EFB, perhaps so as to enable them to live on a lower income with greater time spent at home during the day with the consequent need for higher energy use:



**Figure 14: Box plot of Cost of being more environmentally-friendly and occupation (n=56)**

If more were to be done to reduce the cost, this indicates that CO<sub>2</sub> emissions would be reduced among the retired population.

### *Ethnicity and disability*

54 of the sample described themselves as white British. Similarly, only three of the sample classed themselves as disabled and therefore no conclusions can be

drawn to compare the views of people with different ethnic backgrounds or disabled and non-disabled people in the village.

#### 4.1.8 Psychological theory analysis

Many of the questions in section A were designed in such a way as to give a very simple indication as to whether further examination of the population using one or more psychological theory to identify trends in motivation and barriers to going carbon neutral would be fruitful. The theoretical frameworks underpinning this research were:

**Table 12: Theories and questions**

Theory	Expected response from NPs	Qu. nos.	Question
Social capital	I keep myself to myself – I'm not involved in the local community	1 13 14	Household involvement in village activities "I know someone involved in the Project" "None of my close friends/household is keen on EFB"
Planned Behaviour	It's too much time and effort	9	"I would like to do more environmentally-friendly things but I tend not to because I've got other more pressing or important things to deal with."
Socio-economic status	I can't afford it	15	"The cost of being more environmentally-friendly puts me/us off."
New Economic Paradigm	I don't agree it's worthwhile	10	"I don't think that what I am doing/could do will make any difference to climate change."
Diffusion	I never get involved with things like this unless everyone else does first	11	"The dangers of climate change are exaggerated."
Reactance	Don't like being told what to do	12	"I often feel like I'm being "preached at" about Climate Change and I don't like it."

A synopsis of the main findings follows.

#### *Social Capital Theory*

The relevance of this theory (e.g. Putnam, 2000) to the Project is that individuals and households are investing their time and energies in community activities to derive social and other benefits in the short, medium and long term. As such an



activity and supporting other activities through its aims, the Project could not only strengthen the community infrastructure but increase the range and extent of residents' EFBs. The research endeavoured to discover whether such investment activities had brought about CO<sub>2</sub> emission reductions and whether the Project and/or the CO<sub>2</sub> reduction activities it was seeking to promote was a vehicle which enabled people to build social capital and derive benefits in a range of ways.

The level of community involvement by the NPs with 38 (67.9%) households containing someone who was involved in community activities (see appendix 3) was greater than anticipated. The following two tables show that NP households who are involved in no community activities are performing most EFBs:

**Table 13: Groupings of nos. of EFBs and Respondent is involved in community activities: cross tabulation**

		Respondent involved in community activities			Total
		Ashton Hayes Primary School	A N Other	None	
Groupings of nos. of EFBs	one to 3 EFBs	0	14	11	25
	four + EFBs	2	10	19	31
<b>Total</b>		<b>2</b>	<b>24</b>	<b>30</b>	<b>56</b>

The same is true if other residents' involvement in community activities is examined against numbers of EFBs:

**Table 14: Groupings of nos. of EFBs and Another resident is involved in community activities: cross tabulation**

		Another resident involved in community activities			Total
		Ashton Hayes Primary School	AN Other	None	
Groupings of nos. of EFBs	1 to 3 EFBs	2	12	11	25
	4+ EFBs	4	8	19	31
<b>Total</b>		<b>6</b>	<b>20</b>	<b>30</b>	<b>56</b>

Thus, involvement in community activities is not necessarily related to higher performance of EFBs currently, in fact, if anything, the reverse is true. Only two (3.6%) NPs identified themselves as disabled indicating that physical constraints

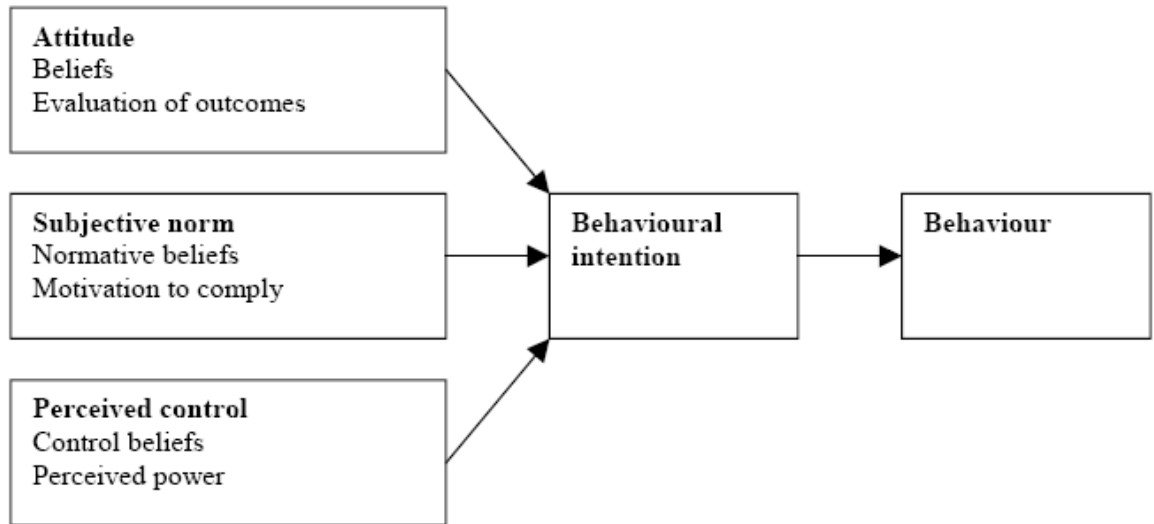
on community involvement were very limited for the sample although many other reasons pertain for non-involvement.

However, new and strengthened EFBs have resulted from links made by NPs to the Project from community activities. 16 (28.6%) respondents said that they or members of their household were regularly attending community activities which had brought them into contact with the Project and all of these said that this contact had encouraged them to live in a more environmentally-friendly way in practice. Of those who have had contact with the Project through community activities, 62.5% have engaged in new EFBs. 58.9% (33) respondents said they knew a member of the Project team, perhaps a further indication that the NPs are well connected within the village. Furthermore the role of close friends and family who are keen on EFBs seems significant in influencing EFBs.

It seems therefore that the Project benefits from the social contacts made by NPs in the village and from the links NPs have with close friends who are keen on EFBs. However, if an NP household is not involved in a community activity, it is likely they will be performing more EFBs than those which are. More will be said on this in the Ps' findings.

#### *Theory of Planned Behaviour (TPB)*

This theory holds that 'behavioural intention' is the key determinant of behaviour. This is influenced by three components: a person's attitude toward performing the behaviour; the perceived social pressure to adopt the behaviour, called the subjective norm; and perceived behavioural control:



**Figure 15: The Theory of Planned Behaviour (Ajzen, 1991)**

TPB's relevance to the Project is that unless residents have a pro-environmental attitude and identified for themselves that addressing climate change is a sufficient priority for them, their EFB will be limited. The question whether other issues take priority over addressing the dangers of climate change was raised in question 9. 30 (53.6%) tended to agree, agreed or strongly agreed with this statement and performed low levels of EFBs as expected. As indicated above, there are statistically significant relationships between those who are of this opinion and those who believe that climate change is exaggerated and who dislike being preached at about climate change.

**Table 15: Other things are more important/I am too busy and climate change is exaggerated cross tabulation**

		Other things are more important/too busy					Total
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	
Climate Change is exaggerated	Strongly agree	1	0	0	0	0	1
	Agree	0	3	1	0	3	7
	Tend to agree	0	6	0	1	2	9
	Tend to disagree	0	4	2	2	1	9
	Disagree	2	5	5	0	12	24
	Strongly disagree	0	0	1	1	4	6
Total		3	18	9	4	22	56

**Table 16: Other things are more important/I am too busy and I feel preached at about climate change and I don't like it: cross tabulation**

		Other things are more important/too busy					Total
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	
I feel like I'm being preached at and don't like it	Strongly agree	1	0	0	0	0	1
	Agree	0	3	1	0	3	7
	Tend to agree	0	1	1	0	0	2
	Tend to disagree	0	6	0	2	0	8
	Disagree	1	8	6	2	17	34
	Strongly disagree	1	0	1	0	2	4
Total		3	18	9	4	22	56

These results indicate that those NPs with these views are those performing numbers of EFBs in the village.

### *Socio-economic status: conclusions*

More details are given above on the influence on EFBs of financial cost and cost-saving. In short, cost is a factor for people who are retired. Cost became a factor in the face of large capital investments in particular (e.g. solar hot water heating) but was less of a factor in low-cost EFBs. This indicates the need to support such capital investments if they are to be more widely introduced.

### *New Ecological Paradigm (NEP)*

The question used to identify whether NEP was a significant factor in preventing engagement in the Project's aims was question 10: "I don't think that what I am doing/could do will make any difference to climate change." As identified above there is a statistically significant relationship between those who feel they are making a difference to climate change and:

- their interest in climate change (Spearman's rho.435, sig: (two-tailed) .001),
- their belief that climate change is not exaggerated (negative relationship) (Spearman's rho -.322, sig: (two-tailed) .016), and
- their feeling that they are not being preached and to the point whether they dislike hearing about climate change (negative relationship) (Spearman's rho -.507, sig: (two-tailed) <.001).

15 (26.7%) of the NPs tended to agree or felt more strongly than this about question 10. Some of the comments related to CO<sub>2</sub> emissions by USA and China and the feeling that whatever they as individuals did, it would have no impact on the progress of climate change in face of such increases. It is perhaps surprising that the remaining 73.3% of the respondents felt that they were making a difference and perhaps an indication that we tend to think we are more influential than in fact we are. However, as mentioned above, a strong thread throughout the interviews was that people felt that morally they “had to do their bit”.

It is therefore the case that there is some but small point in pursuing further research or an intervention programme to increase the number of EFBs in Ashton Hayes based on NEP theory.

#### *Diffusion theory*

Diffusion theory suggests that behaviours become widespread because certain individuals follow a trend creating a critical mass of opinion which then others follow (See *Key Respondents* in Darnton, 2004 above). It is therefore important in the NP sample to see if there are significant numbers of individuals who see themselves as followers waiting for a wide range of EFBs to become fashionable which, if pursued, would be a major contribution to the Project achieving its aims.

To establish whether there was such a group in the village, the survey included questions 7 (interest in climate change) and 11: “The dangers of climate change are exaggerated.”<sup>5</sup> This question was posed to identify whether NPs believed in the phenomenon of anthropogenic climate change (table 17):

---

<sup>5</sup> A question such as do you tend to follow what others do in relation to climate change was included in the Ps survey.

**Table 17: The dangers of Climate Change are exaggerated and Number of EFBs now: Cross tabulation**

		The dangers of Climate Change are exaggerated					Total	
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree		Strongly disagree
Number of EFBs now	1	1	0	2	1	1	1	6
	2	0	2	1	2	5	0	10
	3	0	1	1	1	5	1	9
	4	0	1	0	2	5	1	9
	5	0	1	3	1	2	2	9
	6	0	2	2	2	3	1	10
	7	0	0	0	0	2	0	2
	10	0	0	0	0	1	0	1
<b>Total</b>		<b>1</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>24</b>	<b>6</b>	<b>56</b>

As can be seen here, 39 (69.7%) tended to disagree with this statement or felt stronger than this and with eight in agreement. It may be supposed that the fashion is established and people already following it. If this were the case, there would be a correlation between strength of agreement/disagreement and the number of EFBs undertaken. There is some indication that this is the case in the table below. However, the average number of EFBs per person does not continue to rise as would be expected if strength of opinion were to be matched by behaviour:

**Table 18: Number of EFBs performed by classifications of question 11:**

	Detail on responses to question: "The dangers of climate change are exaggerated."					
	Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	Strongly disagree
Number of EFBs performed by sample	1	28	34	34	98	24
Average no of EFBs per person	1	4	3.78	3.78	4.1	4

Table 19 indicates that the percentage of those engaging in curtailment processes does not increase where people feel that climate change is more of a danger, although more people are engaging in them (admittedly there are small samples to some responses):

**Table 19: Curtailment processes (repeated) and Classification of response to question 11: “The dangers of climate change are exaggerated.” cross tabulation**

		“The dangers of climate change are exaggerated.”						Total
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	Strongly disagree	
<b>Curtailment processes (repeated)</b>	Curtailment behaviours	0	4	6	6	15	4	<b>35</b>
	No curtailment behaviours	1	3	3	3	9	2	<b>21</b>
<b>Total</b>		<b>1</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>24</b>	<b>6</b>	<b>56</b>

The picture is inconclusive with 1-off energy efficiency behaviours:

**Table 20: Energy efficiency measures (1-off) and Classification of response to question 11: “The dangers of climate change are exaggerated.” cross tabulation**

		“The dangers of climate change are exaggerated.”						Total
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	Strongly disagree	
<b>Energy Efficiency measures (1-off)</b>	Yes	0	6	5	8	18	5	<b>42</b>
	No	1	1	4	1	6	1	<b>14</b>
<b>Total</b>		<b>1</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>24</b>	<b>6</b>	<b>56</b>

As identified above, although all NPs described themselves as pursuing EFBs, these are largely within established and almost traditional patterns of behaviour. There is little evidence of people setting out deliberate new trends. There is social influence on the NPs’ EFBs. While there are only 7 NPs who did not ‘have a green friend’, using a Mann-Whitney U test (table 21), there is a statistically significant relationship between having such friends and the following variables:

**Table 21: I have a green friend and statistically significant variables: Mann-Whitney U test**

Variables	“I have a green friend”	Mean Rank	Asymp. Sig. (2-tailed)
I am aware of the Project	agree	27.07	.032
	disagree	38.50	
Because of Project I am now performing new EFBs	agree	27.00	.033
	disagree	39.00	
I am interested in Climate Change	agree	27.04	.045
	disagree	38.71	
I know what to do about climate change	agree	26.66	.014
	disagree	41.36	

However, although the Project (especially through community activities) and close friends are influencing NPs to engage in EFBs, there is insufficient evidence to conclude that they are following a series of new trends.

### *Reactance theory*

The final psychological theory to be broadly examined in relation to the NP sample is Reactance Theory (Tertoolen et al, 1998). Based upon this theory, the hypothesis being examined as a possible barrier to participation was that NPs disliked being told what to do and therefore did not participate in the Project or its aims. Question 12 “I often feel like I’m being “preached at” about Climate Change and I don’t like it” was devised as the main means by which this could be assessed.

If the hypothesis were to be found to be true, a cross tabulation of this question and the number of EFBs would therefore reveal that:

- those who agreed with this statement were in the majority (or were a sizeable minority),
- they were performing fewer EFBs than those who disagreed with the statement
- there were very few of those who agreed who were influenced by others to be interested in climate change or in any way support the Project’s activities.
- It might also be thought that other things were more important to this group and that the dangers of climate change were being exaggerated.

Nine (16%) NPs tended to agree with the statement or felt more strongly about it and these performed 42 (19.3%) of the EFBs between them. The mean average number of EFBs per person across the NP sample was 3.89. This group of nine in fact exceeded the average anticipated score of 35 EFBs by seven EFBs. This does not indicate antipathy towards EFB although it may not indicate support as



such behaviour may be due to a number of other factors than resistance to take part when asked to (e.g. cost, general thriftiness, etc).

While, as expected, more people in favour of hearing about climate change performed more EFBs because of the Project, a substantial number (30 (53.6%)), were not influenced by it in their EFB. Many of these were already performing their EFBs before the Project and pointed this out while also expressing support for the Project:

**Table 22: Because of Project now new environmentally-friendly activities \* I feel like I'm being preached at and I don't like it": cross tabulation**

		I feel like I'm being preached at and I don't like it						Total
		Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	Strongly disagree	
Because of Project now new EFBs	Strongly agree	0	1	0	0	0	0	1
	Agree	0	1	2	4	10	0	17
	Tend to agree	0	0	0	0	2	0	2
	Tend to disagree	0	0	0	0	1	0	1
	Disagree	1	5	0	4	21	4	35
<b>Total</b>		<b>1</b>	<b>7</b>	<b>2</b>	<b>8</b>	<b>34</b>	<b>4</b>	<b>56</b>

In fact,

- four (7.1%) of the NPs who felt that they were being preached at in any way disagreed with the statement that they were interested in climate change. There is a strong statistically significant negative relationship between these two variables (Spearman's rho  $-.399$  sig. (two-tailed)  $.002$ ),
- six (10.7%) were of this view and also felt they were too busy or other things were more important than climate change
- seven (12.5%) agreed with it to some degree who also thought climate change was exaggerated. There is a strong statistically significant negative relationship between these two variables (Spearman's rho  $-.496$  sig. (two-tailed)  $<.001$ ),
- Spearman's rho was found to be  $-.496$  (sig. (two-tailed)  $<.001$ ) between this variable and those who felt that their EFBs were making a difference.

Finally, although all nine people who wholly or partially agreed with question 12 were aware of the Project, there was no statistically significant link between holding this view and awareness of the Project (Spearman's rho  $-.159$ : sig. (two-tailed)  $.243$ ).

This indicates that there is a small group of people in the village who are resistant to a number of related views, namely that:

- climate change is a danger
- personal EFBs are an important means of addressing it and
- this appears to be linked to a resistance to media publicity and possibly the Project's activities.

Only two people indicated that they disapproved of the Project because "it was silly" (respondent refused to be interviewed) or because they disagreed with the scientific consensus about climate change and that they had a role to play in any case in addressing it (Respondents 21, 28 and 48), only one of whom disagreed with the Project, viewing the media rather as the culprit. One said, "I am following the procedures (for the recycling scheme) – I don't like being dictated to." (Respondent 21). Another opined that climate change was cyclical and that the phenomenon was a "bandwagon," (Respondent 28).

## 4.2 Survey of “Participants” (Ps)

### 4.2.1 Individual findings

Of the 74 households who responded to the questions on involvement in community activities, 40 (54%) reported that no one in the household attended such activities. This is substantially lower than the NP survey and is open to question given that all of them had participated in one or all of the Project’s activities thus far. Supplying the researchers with a list of community activities as was available to the NPs would perhaps have elicited a different response. However, their survey task was already long and detailed.

Respondents were asked for reasons for engaging in EFBs. Seven people (9.2%) did not identify routine as a key component in their EFB and 60.2% of the 88 who responded were retired people probably indicating long-term commitments. This finding was repeated in the first part of question 3 where a very similar response was given to a question on routine. 70 of the 86 who responded (81.4%) said it was because they were “concerned to do their bit”, a view with which no one fully disagreed. The sense of corporate and moral responsibility found in the NPs was very much alive in the P sample. When respondents were asked if they engaged in EFBs because the Council asked them to do so, 39.3% (33 people) agreed with this perhaps indicating either that respect for instructions alone from Local Authorities is insufficient to ensure such compliance. This is more likely than the reason being an inclination against Local Authority intervention being felt by 60% of the population. For, although 42 (51.2% of the sample answering) were of the opinion that it was not the Government’s job to sort climate change out, there is a statistically significant relationship between Ps carrying out EFBs (like recycling) “because the Government asks me to” and the belief that “a community approach to tackling global warming is the best way and I try and do my bit to support it,” (Spearman’s rho .399 (sig. <.001 (two-tailed))). As respondent 7 noted in the NP survey, “these changes in nature are it's frightening. The Government has to do more but everyone has to do their bit.” There was a sense of urgency about

climate change among the respondents. 10.1% (eight) would wait until they knew what to do better before changing to more EFBs with 78.7% (63) believing that climate change was real and had to be addressed.

Question 3 most closely resembles the questions 8-12 of the NP questionnaire which were designed to explore in a very simple fashion respondents' motivation using a summary question of a particular motivational theory:

**Table 23: Theories and questions: Ps survey**

	<b>Theory</b>	<b>Expected response from Participants (Ps)</b>	<b>Qu. nos.</b>	<b>Question</b>
1	Social capital	I am involved in the local community	1 6	Household involvement in village activities "I know someone involved in the Project" "None of my close friends/household is keen on EFB"
2	Planned Behaviour	I am happy to engage in environmentally-friendly behaviour because I see the benefits and want to do what I can.	3b	"I don't do more EFBs because I have other more pressing or important things to attend to."
3	Socio-economic status	Can't afford	2b 3g	I do environmentally-friendly things because I want to save money/don't want to spend money unnecessarily." "The cost of being more environmentally-friendly puts me/us off."
4	New Economic Paradigm	Don't agree it's worthwhile	3c	"I don't think that what I am doing/could do will make any difference to climate change."
5	Diffusion	I never get involved with things like this unless everyone else does first	3i	"I don't tend to get involved with things like this unless everyone does."
6	Reactance	Don't like being told what to do	3h	"I often feel like I'm being "preached at" about Climate Change so I just switch off."

### *Social Capital theory*

Respondents were asked a range of questions to assess their level of engagement in the life of the village through access to its activities and services (question 1), whether they have relationships which were supportive of EFBs and

on their views on a community approach to reducing CO<sub>2</sub> emissions. Furthermore, the Ps were asked whether The Project had influenced them to become more actively involved in the life of the village (question 4). The hypothesis underpinning these questions was that the Project was likely to be more successful if community links were strong and it would also strengthen community links.

As identified above, question 1 may not have been answered as fully as it was with the NP survey. A similar response was found in relation to the influence that environmentally-keen friends and close relatives have on respondents. 33 people (39.3%) agreed that they start or continue with EFBs because friends and relatives encourage them to do so. In spite of this, 72 of 88 respondents (81.8%) thought a community approach to addressing Climate Change was the best way forward with only seven (8%) disagreeing with this statement, a great vote of confidence in the Project. Further it seems again to suggest that the small numbers of people involved in community activities is unlikely to be fully representative. When this view is combined with the views expressed about the Government's role in addressing climate change above, the strong impression here is that people want to have the resources and support available locally but not be under pressure from Government or a Local Authority to comply with regulation. Initial indications are that in the first year the Ps' CO<sub>2</sub> emissions were reduced by 20% which is an indication that this responsibility is being taken seriously and at least partially discharged.

The Ps' answers to whether the Project had influenced them to become more involved in the life of the village reveal that 30 (35%) of the respondents believed that it had. A further five (6%) denied it had because they were already involved in the village and others may have felt this but not commented. An evaluation of the community renewable energy Projects funded by the Government (Walker, 2006) identified that one of the soft outcomes arising from the Projects was an increased sense of pride felt by the respondents because of involvement in the Project. Question 5 was therefore asked of the Ps to see if this held in Ashton Hayes. 53

(63.1%) of those who responded agreed that the Project had made them feel proud to belong to the village because of the Project. Some took time to comment who had not agreed with the statement:

- “We were proud of the village anyway!” (three respondents),
- “It has put the village on the map!” and
- “Well done!”

It is clear from one of these comments at least that the media interest the Project has generated will have contributed to this sense of pride. However, this is a significant achievement indeed and the Parish Council and Project Team are indeed to be congratulated. There are statistically significant relationships between this sense of pride and a range of other variables indicating that pride itself may be a contributing indirect motivational factor:

**Table 24: I feel proud of Ashton Hayes because of the Project/range of variables: Mann-Whitney U Test**

	I'm concerned to do my bit	Friends/ household encourage	community approach is best	I'm in a routine	I make a difference	I disagree with climate change	Cost puts me off	I feel preached at & switch off
<b>Asymp. Sig. (2-tailed)</b>	<b>&lt;.001</b>	<b>.031</b>	<b>&lt;.001</b>	<b>.028</b>	<b>.006</b>	<b>.040</b>	<b>.006</b>	<b>.011</b>

It is evident therefore that there is a strong relationship between the success the Project has had in engaging people and the strong links that exist and have been fostered by the addition of the Project to the village's range of activities. It is also true to say that for other communities considering ways in which they can enhance the sense of pride and strengthen the bonds which underpin any successful community, a well designed and supported carbon neutral project can play a significant part.

In terms of educational background, 18 of the 30 who were linked to the village through the Project (n=82) were from a non-higher education background:

**Table 25: The Project linked me to the village & Ps' educational background: cross tabulation**

		Ps' educational background							Total
		Left school at 14	Left school at 16	Left school at 18	1st degree/ diploma	Postgrad. qualificn.	Profess. study	Other	
Project linked me to village	Agree	2	12	3	7	5	0	1	30
	Disagree	8	17	2	8	13	3	1	52
<b>Total</b>		<b>10</b>	<b>29</b>	<b>5</b>	<b>15</b>	<b>18</b>	<b>3</b>	<b>2</b>	<b>82</b>

While many of the respondents were retired and may not have had access to higher education in their teens, of the 30 (36.6%) of the respondents who were linked to the village by the Project, the largest group 12 (40%) were those who left school at 16, a small sample none the less.

Furthermore 12 of the 25 employed respondents said the project had linked them to the village which is a higher percentage than the retired respondents answering this question. Slightly more men (17) than women (13) engaged in village life because of the Project (n=79). This may indicate that the Project is having some success in particular in engaging working men without a higher educational background in community life. 65 (77.4%) of the 84 respondents lived in either detached houses or bungalows and 23 (35.4%) of the 30 who said they were linked to the village by the project lived in these properties. Given that detached properties usually are more expensive, this perhaps indicates that those with higher incomes are accessing village life through the project.

### *Educational background*

A number of interesting findings emerge from the Mann-Whitney U Test of educational background and a range of other variables which are statistically significant (Asymp. Sig. (2-tailed)). Those without a university education, compared to those with one, are:

- less put off EFBs by cost (.011)
- more inclined to follow Council requests to act (e.g. recycle) (.013)

- believe a community approach to tackling climate change is best (.037)
- continue as they are until they know what they can do about climate change (.003),
- think all this Climate Change stuff is guess work and not worth their bothering about (.016).

These findings indicate that among those without a higher educational background there is potential to increase the number of EFBs through the Project with greater intervention from statutory agencies as long as clear and persuasive information on climate change accompanies the efforts.

Question 8, “*What would you personally be unwilling to change to address Climate Change and please say why?*” was asked to identify non-EFBs respondents would be prepared to reduce or eliminate. 35 (38.5%) chose not to answer this and most responses were not detailed. The most frequently mentioned behaviour which people would not forego was driving a car (26 (46.4% of respondents) and the rural/isolated position of the village adds to transport needs. This reflects Beckworth’s findings cited by Darnton (2004) above. This does not mean that people will not reduce car use however. Six referred to the poor public transport alternatives.

### *Occupation*

Using a Kruskal-Wallis Test, it appears that those who are retired (n=45) are more intent on continuing as they are until they know what they can do about climate change than those who are employed:

**Table 26: Occupation and need for information to act (further) to address climate change (Grouping Variable: P: job retired other): Kruskal-Wallis Test**

	P: job retired other	N	Mean Rank	Asymp. Sig.
I will continue as I am until I know what I can do about climate change.	employed	24	41.83	<b>.025</b>
	retired	45	31.36	
	<b>Total</b>	<b>69</b>		



*Ashton Hayes Primary School*

12 of the 13 respondents who were themselves involved in Ashton Hayes Primary School and 10 of the 11 who stated that other household members were involved with the school were of the opinion that a community approach to climate change was the best methodology. Again this was not a huge sample (23 (25.3%) of the total 91 available) but it is an encouraging finding that the school is having such an important part to play in the life of the Project. All 13 (100%) were concerned to do their bit, were unwilling to wait till they knew better before addressing global warming, did not feel preached at about climate change and had a friend or household member who was keen on environmentally-friendly behaviour. However, only a third (four) were encouraged by these friends to undertake more EFBs.

*Theory of Planned Behaviour*

Question 3b asked respondents if it was true that: “I don’t do more EFBs because I have other more pressing or important things to attend to.” 62 respondents (76.5%) disagreed with the statement with seven (8.6%) agreeing. The following table demonstrates that the respondents showed that routines do not get in the way for them of EFBs despite living busy lives, a result which is statistically significant ((Spearman’s rho .546 (sig. <.001 (two-tailed)) (n=80)):

**Table 27: “I don’t do (more) “environmentally-friendly” things because “I have other more pressing or important things to attend to.”/ “I’m in a routine - I’ve always lived this way.” cross tabulation**

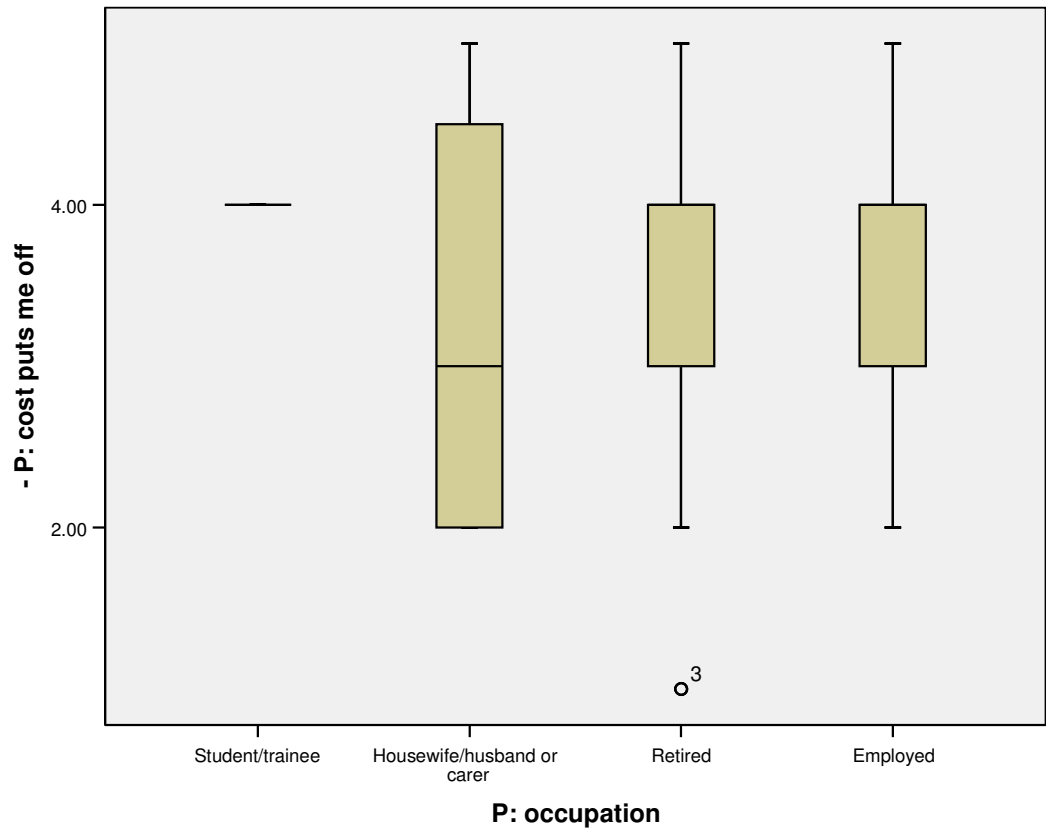
“I don’t do (more) “environmentally-friendly” things because ....”		“I have other more pressing or important things to attend to.”				Total
		Agree	Neither agree nor disagree	Disagree	Strongly disagree	
“I’m in a routine - I’ve always lived this way.”	Strongly agree	0	1	0	0	1
	Agree	0	2	4	0	6
	Neither agree nor disagree	2	4	6	0	12
	Disagree	4	5	34	0	43
	Strongly disagree	0	0	9	9	18
<b>Total</b>		<b>6</b>	<b>12</b>	<b>53</b>	<b>9</b>	<b>80</b>

This indicates that:

- the Ps sample prioritises EFBs more highly than the NPs of whom 19 (37.3%) thought the relative importance of other things and the general busyness of their lives prevented them from engaging more in EFBs and
- measures that fit with this theory base would be better applied to the NP population in the village.

#### *Socio-economic status*

54 (67.5%) of people were not put off by cost from being more environmentally-friendly while 72 of the 87 respondents (82.8%) stated that it was because of cost that they conducted their EFBs with only eight (9.2%) disagreeing. This indicates that respondents see financial return as a key factor both in terms of energy efficiency behaviour and drawing benefits from curtailment behaviours. 14 (17.3%) saw cost as a deterrent. 79% (64 people) who answered this question lived in either detached houses or detached bungalows and 12 of the 14 people who saw cost as an issue lived in these properties suggesting that the nature of the property may well have a part to play in determining reluctance to engage in further EFBs. In terms of income generation, 47 people were retired and 25 in employment among the respondents who answered this question (other groups were too small in number to be representative). The box plot below (figure 16) indicates a more even spread than among the NPs in terms of older people seeing cost as a deterrent to further EFBs. It is apparent however, that cost is not a sufficiently deterring factor generally for Ps to engage in further EFBs.



**Figure 18: Occupation and cost as a deterrent to further EFBs**

### *New Ecological Paradigm*

Examining the Ps' responses through the filter of this theory entails assessing any potential link between a large part of the sample and an agreement that they see addressing climate change as worthwhile. Question 3c ("I don't think that what I am doing/could do will make any difference to climate change.") was asked in order to explore this. Only 3 (3.7%) of the sample agreed with this statement and although this is lower than the response of the NPs where 15 (26.7%) tended to agree or felt more strongly than this about the question, this indicates that there is little point focussing on methods which are based on New Ecological Paradigm in the village.

### *Diffusion Theory*

Diffusion theory advocates the identification of fashion-makers (leaders) and promoting their message successfully to "fashion-followers" so that the fashionable

behaviour (in this case, more EFBs which reduce CO<sub>2</sub> emissions) is taken up. In this survey, question 3i: “I don’t tend to get involved with things like this unless everyone does,” was used to assess people’s attitudes and to see if they were ready to follow a lead or deterred from undertaking further EFBs because of a lack of one.

66 (81.5%) disagreed with this statement indicating that less than one in five people among the Ps in the village requires strong leadership input to make undertaking more EFBs sufficiently attractive for them to engage further in achieving the Project’s aims. As indicated above, the number behaving in a routine way in relation to EFBs accounts for at least 73.5% of the Ps population. This may be a further indication that changing behaviours will be difficult. However, this inquiry into diffusion may indicate that there is no need to blaze a trail or even that people are not aware of a significantly different trail in terms of new EFBs from those they are currently performing to realise that a new fashion is required. Unfortunately, in the Ps sample, the researchers were unable to identify the EFBs being performed and therefore it is not possible to assess whether the Ps’ EFBs differs in any marked way from the NPs’ who were following a traditional range of EFBs. If the fashion is to support the project’s aims, as the Ps are doing, introducing new EFBs should be well supported.

#### *Reactance Theory*

Question 3h “I often feel like I’m being “preached at” about Climate Change so I just switch off,” which was very similar to a question asked of the NPs, was used to assess whether the Ps population was resistant to engage in more EFBs because they reacted against being told what to do. Five of those asked (6.3%) agreed with this statement indicating that reactance was not a problem.

### **4.3 Comparing the NPs and Ps surveys**

While the questionnaires were different in many respects, some questions were the same or very similar although the questionnaires were delivered in slightly

different ways. That said, there are noteworthy findings from comparing both sets of respondents.

Answers are similar (in percentage terms) for a number of comparable questions in the samples. This indicates that there are strong similarities between the samples. Both samples record very high numbers of people having friends who are keen on EFBs. Cost is not seen as a significant barrier for nearly  $\frac{3}{4}$  of the population<sup>6</sup> and the sense of agency is similar, although higher among the Ps. The marked difference is in terms of use of time and personal energy on EFBs (in bold):

**Table 28: Comparing variables between NP and P samples**

Question	NPs (%)		Ps (%)	
	Agree	Disagree	Agree	Disagree
I have a friend keen on EFB	87.5	12.5	97.6	2.4
The cost of being more environmentally-friendly puts me/us off	23.2	76.8	25.3	74.7
<b>I don't do more EFB because I'm too busy/other things are more important</b>	<b>53.6</b>	<b>46.4</b>	<b>16</b>	<b>84</b>
I make a difference to climate change through my EFB <sup>1</sup>	73.2	26.8	86.4	13.6
Demographic features				
Higher/non-higher education	25	75	38.6	61.4
Retired/employed	40	60	67.1	32.9
House type (detached bungalow/detached house)	48.2	23.2	40.7	36.3

The two questions were not precisely identical. However, there is a marked difference which is not easily attributable to phrasing. This may be due to differences between the two samples in the percentages of people who are employed and retired and the greater number of retired people having more time available, although many retired people say they are often very busy after giving up paid work. Also, there were slightly more people who had accessed higher education in the Ps sample. Unfortunately data on the Ps number or extent of

---

<sup>6</sup> Although, as identified above, this is not the case when expensive capital items (e.g. solar panels) could be considered.

EFBs were not collected as this would have duplicated parts of the Baseline Update survey. However the differences in demographic factors involved above are not sufficient to explain such a marked difference entirely and further motivational factors are required. This would involve speculation given that the questionnaires were in other ways not comparable.

A number of statistically significant relationships were found in the NP sample between being too busy to undertake more EFBs/other things were more important and:

- Interest in climate change (Spearman's rho  $-.432$ : sig. (two-tailed)  $.001$ ) (negative correlation)
- Feeling that climate change is exaggerated (Spearman's rho  $.319$ : sig. (two-tailed)  $.017$ ) and
- The respondent feeling preached at and disliking this (a small sample) (Spearman's rho  $-.272$ : sig. (two-tailed)  $.042$ ).

In the Ps sample, there were even more statistically significant relationships with this variable and:

- I am concerned about climate change and want to "do my bit" (Spearman's rho  $-.238$ : sig. (two-tailed)  $.036$ ) (negative correlation)
- Community approach to climate change is best (Spearman's rho  $.226$  sig. (two-tailed)  $.044$ )
- I don't do things because I'm in a routine (Spearman's rho  $-.548$ : sig. (two-tailed)  $<.001$ ) (negative correlation)
- I am making a difference to climate change (Spearman's rho  $-.456$ : sig. (two-tailed)  $<.001$ ) (negative correlation)
- I'll continue until I know better (Spearman's rho  $.317$ : sig. (two-tailed)  $.005$ )
- Lack of credibility of climate change and its importance (Spearman's rho  $-.300$ : sig. (two-tailed)  $.008$ )
- Cost puts me off (Spearman's rho  $.474$ : sig. (two-tailed)  $<.001$ )

- Being preached at and so switching off (Spearman's rho .378: sig. (two-tailed) .001)
- I don't tend to get involved with things like this unless everyone else does (Spearman's rho .279: sig. (two-tailed) .013)

Some of the sample sizes of those agreeing with the bulleted variables are small. However, it seems that addressing this issue successfully will be a part of ensuring a community carbon neutral project is able to reduce CO<sub>2</sub> emissions across the board.

## 5 Conclusions

This section is comprised of conclusions based on:

1. The findings,
2. Analysis of the theories,
3. Methodological findings,
4. Overall conclusions.

### 5.1 Conclusions from the findings

Both samples of respondents, the NPs and Ps, are helping to meet the Project's aims by carrying out EFBs. Possibly 0.6% of households may not be undertaking any EFBs.

- Despite the fact that the NPs questioned had not participated in any of the Project's events, all stated they were regularly carrying out at least one EFB (the mean average number was 3.82 per household).
- 98.2% of NPs (and all of the Ps) were aware of the Project with 20 NPs (35.7%) undertaking new EFBs because of it.
- 46 (82.1%) of respondents said they were interested in climate change with strength of interest largely reflecting the extent of EFBs. It appears that people are at least in part motivated by:
  - Their interest in climate change,
  - A belief that they were making a difference to it
  - Saving money
  - EFB being perceived as a moral responsibility.
  - Habitual behaviour
  - Being asked by Local Authorities (e.g. to recycle)



- Encouragement from friends and family
- Being part of a community-based programme and
- Being proud of Ashton Hayes
- The EFBs being performed (on average 3.82 per household among NPs) were standard curtailment and energy efficiency behaviours very few households using zero carbon methods to provide heat and power.
- The equivalent of 127 households (36.3%) ((26 (46.4%) of the NPs and as many as 21 (26.6%) of the Ps) need more and better information so that they fully understand why and what they need to do to reduce CO<sub>2</sub> emissions. Communication needs to address the view that this can be done effectively within the householder's available time and is at least as important as other pressing tasks factors if this barrier to EFB is to be overcome. Abrahamse et al (2005) recommend focussing especially on energy efficiency behaviours rather than on curtailment as these are likely to produce the greatest savings in household energy consumption. With 35% of heat lost through walls and 25% through the roof, the Project team should give consideration to emphasising these improvements.
- Cost, at least for curtailment behaviours, is not a barrier until people consider larger capital items (e.g. installing heating systems or solar panels).
- Households led by retired people over 60 are performing more EFBs than younger employed neighbours and are more deterred by the cost from undertaking more EFBs.
- NPs with higher education backgrounds are undertaking more EFBs than those who have not, know more about it and are well connected to the Project.
- There is some indication that working men are being attracted into village life through the Project with most being from a non-higher education background.
- Those living in detached bungalows perform most EFBs.

- Because samples are too small to be conclusive, it cannot be stated that a household's involvement with Ashton Hayes Primary School is an indicator of increased EFB although the results produced lead strongly to that conclusion.

## 5.2 Theory analysis

Using a simple methodology, an attempt was made to assess the strength of influence of a number of motivational theories for possible future use. The use of the Theory of Planned Behaviour would be beneficial in promoting more EFBs, especially among NPs. Levels of uncertainty about what to do about climate change and a small degree of scepticism were found 36.1% of households. TPB and Stern (2005) suggest the “unfreezing” of routine behaviours through a variety of means, not least improved information and communication, to increase EFBs.

There are two sections of the population in the village:

1. Households which are performing most EFBs are less likely to have members who are involved in any community activities.
2. Almost all respondents had people who were friends/close relatives keen on EFB. Many have contacts with the Project members. Further, households involved in community activities are undertaking more EFBs because they access the Project through them. This indicates that:
  - the social support necessary to bring about further reductions in CO<sub>2</sub> emissions is available (Jackson, 2005). Among the Ps sample, 72 of 88 respondents (81.8%) thought a community approach to addressing Climate Change was the best way forward
  - 30 (35%) stating that the Project had influenced them to become more involved in the life of the village. This seems to indicate that people are investing time in community activities.
  - 53 (63.1%) of Ps said they felt proud to belong to the village because of the Project.

**Furthermore, the Project in Ashton Hayes is, and similar Projects elsewhere can be, an effective means of strengthening local community as well as being beneficial for the environment and Social Capital Theory provides useful insights into the Project's development thus far.**

With the sense of personal agency being high, there is little need to pursue further intervention or research based on **New Ecological Paradigm**. Similarly there is little indication that people are following trends and that **Diffusion Theory** can provide a reliable basis for future intervention at this point unless it were to be combined with the introduction of renewable energy technologies still in their infancy in the village. Ten (17.9%) of NPs and five (6.3%) of the Ps tended to feel or felt stronger that they were being preached at (appears to be media interest rather than the Project) and disliked it. Only one of these had undertaken new EFBs because of the Project. As far as **Reactance Theory** is concerned, there is a small group of people in the village who are resistant to a number of related views, namely that:

- climate change is a danger
- personal EFBs are an important means of addressing it and
- this appears to be linked to a resistance to media publicity and possibly the Project's activities.

There is some evidence therefore that this theory can account for some non-participation with the Project's aims although these numbers are small.

### **5.3 Methodological conclusions**

Analysis of the surveys was made more difficult by some design features:

1. A more definitive list of EFBs esp. for the Ps would have been beneficial although time in the interviewing process probably militated against this. Shortening the Ps questionnaire (see 4 below) could have made it more manageable assisted.

2. A more detailed briefing of the student interviewers should have been undertaken.
3. the use of a number double negative questions and double questions (e.g. NP14, P3) did not assist the respondents or the analysis
4. Several of the questions in P3 repeated elements of P2.
5. Maintaining six possible answers in the Likert scales in the P questionnaire would have been better practice to prevent people taking the middle of five options.
6. Direct questions asking people why they were/were not participating would have been useful. This would however have meant that the use of the theory analysis could have been repetitious and would have led to a greater analytical complexity.
7. The inclusion of one or two more qualitative questions could have been accommodated and the questionnaire could possibly have been shorter although there was the risk that the interview would have been extended. As it was, developing a list of possible reasons why people were/were not participating followed by a question asking for other reasons was acceptable.
8. An age breakdown for the Ps would have been useful as it was for the NPs (it was not included because it was contained within another piece of research).
9. While Charnock (2007) refers to the village residents as “relatively well off”, this was not always the case and an income breakdown for both samples would have been useful in assessing more accurately cost-related motivators and barriers?
10. Asking the Ps more of the questions in the NP questions would have enabled greater comparison of the two samples.

## **5.4 Conclusions**

The aims of the research have been met by identifying factors underpinning successful participation in achieving the aims of a community carbon neutral project and factors hindering participation. Recommendations for the Project and other communities considering ways of facilitating community participation in carbon neutral Projects are contained within the Project's Toolkit for Small Communities and further recommendations for this are made in the following section.

Basing the research on two samples of those who had and had not participated in the Project thus far was an appropriate method. It is hoped that the findings and recommendations will be of use to the Project as it moves forward and in its development of its support materials for other community projects.

### **5.4.1 Limitations of use for the research.**

While there motivational and preventive factors have been identified in these surveys, it is not possible to determine which are the most significant or indeed which come into play when others do not. Stern (2005) and Bamberg (2003) identify the limitations both of psychological theories per se and of theories based on attitudes, norms and control as predictors of environmentally-friendly behaviour. However, the identification of the factors at play and an appropriate theoretical framework to underpin future intervention is potentially of benefit to Ashton Hayes Going Carbon Neutral Project and to other communities using or contemplating developing such initiatives.

## **6 Recommendations**

### **6.1 Theoretical framework**

Bamberg (2003) suggests that those with low levels of environmental concern are most influenced by social situations and those with higher levels by their perceptions of agency (“control” in TPB terms). Concentrating on extending therefore the Project’s influence through social networks and community activities should be a priority. Although there is however a high degree of agency reported in the surveys, especially among people from a higher education background, those more and less interested in climate change would benefit from social support to encourage one another in the Project’s attempts to maintain, extend and increase EFBs.

Therefore the Project team should consider the use of Theory of Planned Behaviour and Social Capital Theory in further planning and activity to achieve the Project’s aims, strengthen social and community networks and improve residents’ quality of life.

### **6.2 Communication**

- Personal relationships are very much a feature of the development of the Project. Building on social capital theory, a programme, perhaps underpinned by the Energy Saving Trust’s CAfE programme, should be explored to train a wider group of volunteers at key strategic points and within community activities in the village to encourage further EFBs and greater community engagement with the Project.
- Based upon TPB, these materials should be underpinned by clear information on the impact of climate change (e.g. findings from the latest IPCC report, 2007) and practical advice sheets. These should focus on energy efficiency behaviours primarily as well as curtailment behaviours and detail how, wherever possible, they can be funded externally with cost:

benefit analyses based upon local experience included. This could also include communication tips on how to be a more encouraging environmentally-friendly friend.

- The high-profile fun events to celebrate the Project's successes and promote its message should continue.
- Representations should be made to Government agencies to encourage a more conducive policy framework for sustainable consumption and renewable energy as outlined by Jackson (2005).

### **6.3 Different age groups**

The Project team should consider:

- targeting more directly people aged under 60 so that they might have a greater reduction in emissions from this group which is likely to have higher household populations and be higher consumers of energy.
- looking at the opportunities that exist to maximise the reductions of CO<sub>2</sub> emissions from over 60s, particularly focusing on energy efficiency behaviours as this group is likely to require higher domestic heating levels and be at home for longer periods than their younger neighbours, many of who are likely to be out at work during the day.
- how older people in the village might assist the Project further
- as the older generation passes, the impact of younger people moving into the village on current evidence is likely to increase the CO<sub>2</sub> emissions rather than reduce them. Careful thought should be given to how to assist new entrants to the village.
- maintaining the focus on Ashton Hayes Primary School and extending it to Helsby High School to encourage much-needed environmental awareness with secondary school aged young people (Ferry, 2007) a view echoed by Respondent 5, "Everyone seems to be interested in Climate Change young people don't seem to care and we're saving it for them. They are very wasteful."

#### **6.4 Project methodology**

The Project has already established its method of measurement. However, as methane (CH<sub>4</sub>) is 23 times more powerful as a greenhouse gas than CO<sub>2</sub> and a large percentage of methane in the UK is emitted from landfill sites, the contribution the village is making to reduce carbon emissions through reuse and recycling should perhaps be reconsidered by the Project team as part of its attempts to go carbon neutral.

**Word count 14,988**



## 7 References

Abrahamse W, Steg L, Vlek C and Rothgatter T (2005) A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, 25 (3) pp.273–291.

Adams D (2007) Millions say it is too much effort to adopt greener lifestyle. *The Guardian*, 15th August 2007, [Online], Available from: <http://www.guardian.co.uk/environment/2007/aug/15/ethicalliving> (accessed on 16 August 2007)

Alexander R, Hope M and Degg M (2007), *Mainstreaming Sustainable Development – A Case Study: Ashton Hayes Is Going Carbon Neutral* in Local Economy 22(4) 62 – 74, February 2007, University of Chester UK

Bamberg S (2003) How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, 23 (1) pp.21–32.

Barr S (2003) 'Strategies for Sustainability: Citizens and responsible environmental behaviour. *Area*, 35 (3) pp.227-240.

Barr S et al (2003 a) *The potential role of NGOs in embedding sustainability*. A Working Paper, Global Action Plan. Department of Geography, University of Exeter.

Barr S, Gilg AW and Ford NJ (2003 b) Who are the environmentalists? Part 1: environmentalism in Britain today. *Town and Country Planning*, 72 (6) pp.185-186.

Bedford T (2003) *Sustainable lifestyles: Reports 1, 2 & 3*, The Centre for Sustainable Development at the University of Westminster for Dept of Transport New Horizons [unpublished]

Bin S and Dowlatabadi H (2005) Consumer lifestyle approach to US energy use and the related CO2 emissions. *Energy Policy*, 33 (2) pp.197-208.

Brook Lyndhurst and MORI (2003) Attitudes to renewable energy in London. London: London Renewables. Available from:  
[http://www.london.gov.uk/mayor/environment/energy/docs/renewable\\_attitudes.pdf](http://www.london.gov.uk/mayor/environment/energy/docs/renewable_attitudes.pdf) (accessed August 26th 2007)

Brook Lyndhurst and MORI (2002) *Household waste behaviour in London*. London: Resource Recovery Forum. Available from:  
<http://www.london.gov.uk/gla/publications/environment/household-waste-05.pdf> (accessed August 26th 2007)

Burningham K and Thrush D (2001) *Rainforests are a long way from here: The environmental concerns of disadvantaged groups*. York: Joseph Rowntree Foundation. Available from:  
<http://www.jrf.org.uk/bookshop/eBooks/1842631462.pdf> (accessed August 26th 2007)

Charnock G (2007) *Grass Roots Village Action Inspires other Communities to take on the challenge of Climate Change* in *Local Economy*, Vol. 22, No. 1, 75–79, February

Darnton A (2004) *Driving public behaviours for sustainable lifestyles*. Report 2 of Desk research commissioned by COI on behalf of DEFRA. Available from:  
<http://www.sustainable-development.gov.uk/publications/pdf/desk-research2.pdf>. (accessed August 26th 2007).

Dawe F. (2002) Public attitudes towards development: knowledge and attitudes concerning poverty in developing countries. London: The Department for International Development. Available from:  
<http://www.dfid.gov.uk/pubs/files/omnibus2002.pdf> (accessed August 26th 2007)

- DEFRA (2001) *Survey of public attitudes to quality of life and to the environment*. London: DEFRA.
- Douglas M (1976) Relative poverty, relative communication. In Halsey A (ed.) *Traditions of social policy*. Oxford: Basil Blackwell, pp.197-215.
- Eckes T and Six B (1994) Fakten und Fiktionen in der Einstellungs-Verhaltens-Forschung: Eine meta-analyse. *Zeitschrift fur Sozialpsychologie*, 25 (4) pp.253–271.
- Ferry J (2007) Come on, gang, let's save the world! *The Guardian Unlimited*, June 28, 2007 [Online] Available from:  
<http://environment.guardian.co.uk/climatechange/story/0,,2113300,00.html>  
 (accessed on August 26th 2007).
- Fuhrer U (1995). Sozialpsychologisch fundierter Theorierahmen fur eine Umweltbewusstseinsforschung. *Psychologische Rundschau*, 46 (2) pp.93–103.
- Gaterell MR and McEvoy ME (2005) The impact of energy externalities on the cost effectiveness of energy efficiency measures applied to dwellings. *Energy in Buildings*, 37 (10) pp.1017-1027.
- Gatersleben B and Uzzell D (2003) Local transport problems and possible solutions. *Local Environment*, 8 (4) pp.387-405.
- Gillespie E (2005), "Is it just me or is it getting really hot in here?" Futerra Sustainability Communications
- Gladman JRF, Hart E and Lymbery M (2005) Away from home: An ethnographic study of a transitional rehabilitation scheme for older people in the UK. *Social Science and Medicine*, 60 (6) pp.1241-1250

Guagnano G, Stern P and Deitz T (1995) Influences on attitude-behavior relationships: A natural experiment with kerbside recycling. *Environment and Behavior*, 27(5) pp.699-718.

Hines JM, Hungerford HR and Tomera AN (1986/87). Analysis and synthesis of research on environmental behavior: A meta-analysis. *Journal of Environmental Education*, 18 (2) pp.1–8.

Hobson K (1999) *Sustainable lifestyles: Rethinking barriers and behaviour change*, Environment and Society Research Unit, Geography Department: UCL.

Holdsworth M (2003) *Green choice, what choice? A summary of NCC research into consumer attitudes to sustainable consumption*. London: National Consumer Council Available from:  
[http://www.ncc.org.uk/nccpdf/poldocs/NCC041rr\\_green\\_choice.pdf](http://www.ncc.org.uk/nccpdf/poldocs/NCC041rr_green_choice.pdf) (accessed August 26<sup>th</sup> 2007).

Intergovernmental Panel on Climate Change (2007) *Fourth Assessment Report (AR4)* New York: United Nations.

Jackson T (2005) *Motivating sustainable consumption: a review of evidence on consumer behaviours and behavioural change*. (A report to the Sustainable Development Research Network, University of Surrey). Available from:  
<http://www.compassnetwork.org/images/upload/MotivatingSCfinal.pdf> (accessed August 26<sup>th</sup> 2007).

Lorenzoni I and Pidgeon NF (2006) Public views on climate change: European and USA perspectives. *Climatic Change*, 77 (1-2) pp.73-95.

Lowe T, Brown K, Dessai S, Doria MD, Haynes K and Vincent K (2006) Does tomorrow ever come? Disaster narrative and public perceptions of climate change. *Public Understanding of Science*, 15 (4) pp.435-457.

Nicholson-Cole SA (2005) Representing climate change futures: a critique on the use of images for visual communication. *Computers, Environment and Urban Systems*, 29 (3) pp 255-273.

Ashton Hayes Going Carbon Neutral Project (2007) Available from: <http://www.goingcarbonneutral.co.uk/> (accessed July 24 2007).

Putnam RD (2000) *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.

Schahn J (1993) Die Kluftrwischen Eruntellung und Verhalten beim individuellen Umweltschutz. In Schahn J and Griesinger T (eds), *Psychologie fur dem Umweltschutz*. Weinheim: Psychologie Verlags Union, pp.29-49.

Shove E (1999) *Notes on comfort, cleanliness and convenience*. Paper for the ESF workshop on Consumption, Everyday Life and Sustainability, 5-8 April, Lancaster.

Six B (1992) Neuere Entwicklungen und Trends in der Einstellungs-Verhaltens-Forschung. In Witte EH (ed.) *Einstellung und Verhalten. Beitr. age des 7*. Hamburger Symposiums zur Methodologie der Sozialpsychologie Braunschweig: Braunschweiger Studien zur Erziehungs-und Sozialarbeitswissenschaft, pp.13-33).

Spada H (1990) Umweltbewusstsein: Einstellung und verhalten. In Kruse LC, Graumann F and Lantermann ED (eds) *Okologische Psychologie*. Munchen: Psychologie Verlags Union, pp.623-631.

Stern P (2005) Psychological research and sustainability science. Keynote address given at Conference on Environmental Psychology, Bochum, Germany, September 21<sup>st</sup>.

Stern P (2000) Towards a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56 (3) pp.407-424.

Stern PC, Dietz T and Kalof L (1993) Value orientations, gender and environmental concern. *Environment and Behavior*, 25 (2) pp.322-348.

Stern PC, Dietz T, Kalof L and Guagnano GA (1995) Values, beliefs and proenvironmental action: Attitude formation toward emergent attitude objects. *Journal of Applied Social Psychology*, 25 (18) pp.1611-1636.

Stern P, Dietz T, Abel T, Guagnano G and Kalof L (1999) A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review*, 6 (2) pp.81-97.

Tertoolen G, Van Kreveld D and Verstraten B (1998) Psychological resistance against attempts to reduce private car use, *Transportation Research Part A*, 32 (3) pp.171-181.

Triandis, H (1977) *Interpersonal Behaviour*. Monterey, CA: Brooks/Cole.

UNEP (1998) *UN Development Programme Report*. New York: United Nations.

Urry, J (1995) *Social identity, leisure and the countryside*, Consuming places, London: Routledge

Weigel RH (1983) Environmental attitudes and the prediction of behavior. In Feimer NR and Geller ES (eds) *Environmental Psychology*. New York: Praeger, pp.257-287.

## 8 Bibliography

Ajzen I (1991) The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, 50, pp.179–211.

Alfsen K, Fuglestedt J, Seip HM and Skodavin T (1999) *Climate change: Scientific background and process*, Oslo: Centre for International Climate and Environmental Research. Available from: <http://www.cicero.uio.no/media/8.pdf> (accessed August 26th 2007)

Blacon Neighbourhood Management Pathfinder, Cheshire County Council and Icarus Collective Ltd (2005) *Community engagement checklist, Cheshire County Council*. (Available from Blacon Neighbourhood Management Pathfinder, Ground Floor, Plas Dinas, Blacon Point Road, Blacon Chester CH1 5SN Tel: 01244 373300).

Bryman A and Cramer D (2001) *Quantitative data analysis with SPSS Release 10 for Windows: A guide for social scientists*. Hove: Routledge.

Clift R (2007) Climate change and energy policy: The importance of sustainability arguments. *Energy*, 32 (4) pp.262-268.

Dunlap R, Van Liere K, Mertig A, Catton Jr., W and Howell R (2000) Measuring endorsement of the New Ecological Paradigm: A revised NEP scale, *Journal of Social Issues*, 56 (3) pp.425-441.

Field A (2000) *Discovering statistics: Using SPSS for Windows*. London: Sage.

Gardner GT and Stern PC (2002) *Environmental problems and human behavior (2nd edition)*. Boston: Person Custom Publishing.

Halpern D, Bates C, Beales G and Heathfield A (2004) *Personal responsibility and changing behaviour: The state of knowledge and its implications for public policy*. London: Cabinet Office Strategy Unit.

Heath Y and Gifford R (2006) Free-market ideology and environmental degradation - The case of belief in global climate change. *Environment and Behavior*, 38 (1) pp.48-71.

Kollmuss A and Agyeman J (2002) Mind the gap. *Environmental Education Research*, 8 (3).

Lynas M (2007) The low-carbon revolution starts here. *New Statesman*, 29 January 2007 [Online] Available from:  
<http://www.newstatesman.com/200701290024> (accessed August 26<sup>th</sup> 2007).

Palutikof JP, Agnew MD and Hoar MR (2004) Public perceptions of unusually warm weather in the UK: Impacts, responses and adaptations. *Climate Research*, 26 (1) pp.43-59.

Rothwell A (1998) *Questionnaire design*. Student Learning Development Centre, De Montfort University Library, Leicester.

Rydin Y and Pennington M (2000) Public participation and local environmental planning: The collective action problem and the potential of social capital. *Local Environment*, 5 (2) pp.153-169.

Shove E (2000) *Questions of comfort: Challenging research and practice in the built environment*. Department of Sociology at Lancaster University, for ENERBUILD.

Vringer K, Aalbers T and Blok K (2007) Household energy requirement and value patterns. *Energy Policy*, 35 (1) pp.553-566.

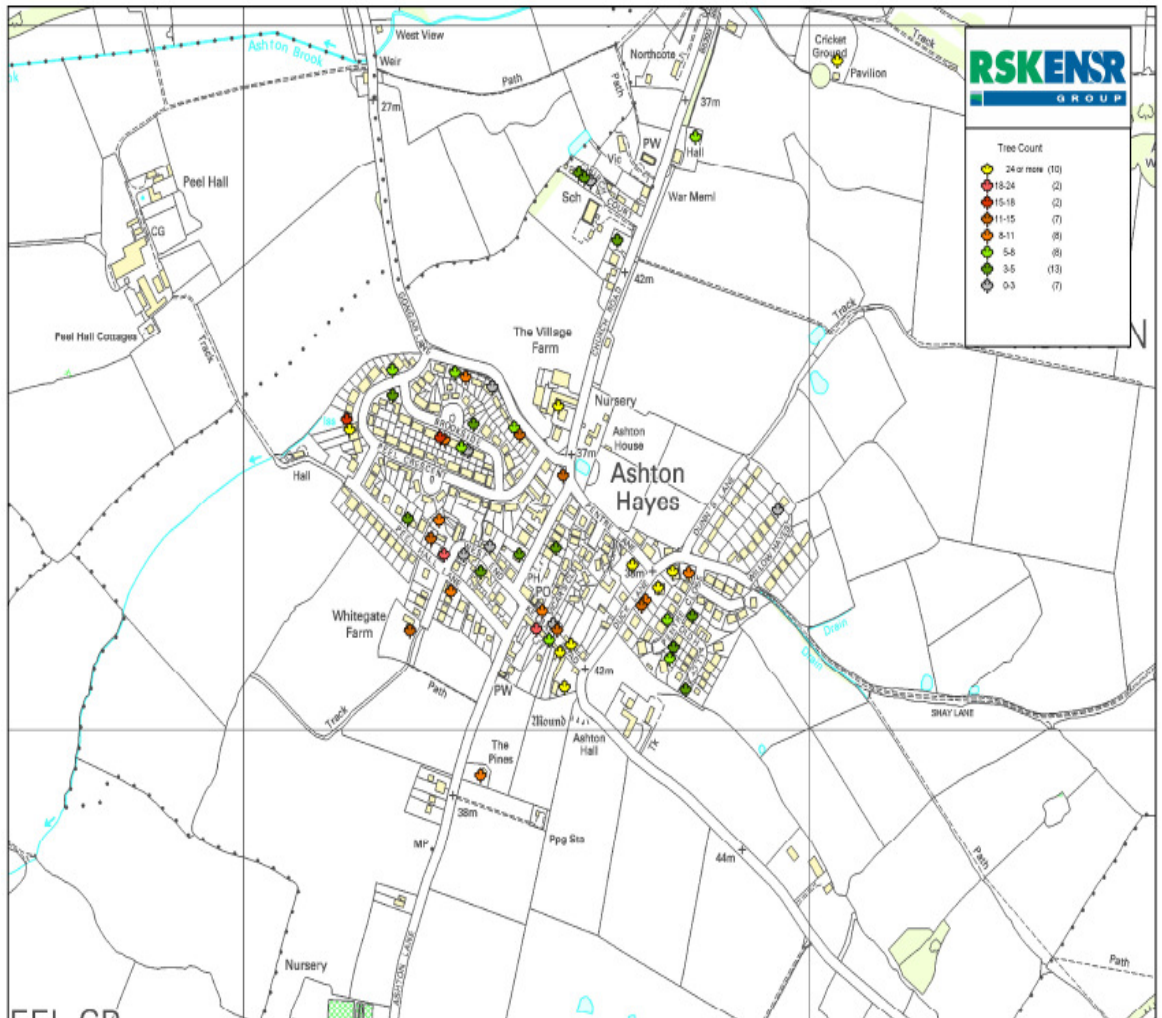


## 9 Appendices

### 9.1 Appendix 1: Map of Ashton Hayes in UK



9.2 Appendix 2: Map of Ashton Hayes showing the tree count (RSK ENSR, 2006)



**APPENDIX 3: NON-PARTICIPANTS' QUESTIONNAIRE**

For office use only:

**QUESTIONNAIRE FOR DE MONTFORT UNIVERSITY RESEARCH INTO  
ASHTON HAYES GOING CARBON NEUTRAL PROJECT****INTRODUCTION**

The *Ashton Hayes Going Carbon Neutral Project* has been set up to help reduce the amount of fossil fuels (coal, gas, oil) people in the village use and to remove from the atmosphere the remaining carbon that these fuels produce when they are burnt (e.g. by planting trees, etc.).

My research is independent of The Project. In this questionnaire, I am trying to find out why people may not be taking part in the Project or environmentally-friendly behaviour. I am not trying to persuade you to join the Project but simply to find out your views. Please answer as fully and honestly as you can. All answers will be anonymous and in confidence.

Thank you!

Ged Edwards  
MSc Student Year 3

**SECTION 1**

1. In the last six months, have you and/or other members of your household regularly been involved with or attend any of the following in the village (please tick all that apply):

	I regularly am involved in/attend ...	Members of my household are regularly involved in /attend...
Ashton Hayes Primary School		
Ashton House Nursery		
Ashton Lions Football Team		
Chapel		
Church		
Cricket Club		
Cubs/ Scouts/Brownies		
Golden Lion Events (e.g. quizzes)		
Playgroup		
Theatre Club		
Village Hall events/classes		
Women's Institute		
Other (which and how regularly):		

2 Has involvement with any of these brought you into contact with Ashton Hayes Going Carbon Neutral Project? YES/NO. If yes, has that encouraged you to live in a more environmentally-friendly way in practice? YES/NO. If yes, please explain:

3 Do you/your household engage in environmentally-friendly activities now? (E.g. recycling, walking to work). If so, which and how often (please feel free to give examples)?

Which? <i>E.g. recycling paper</i>	How often? <i>E.g. Weekly</i>

How far do you agree/disagree with the following statements (please tick one answer)?

4 "I'm aware of the Ashton Hayes Going Carbon Neutral Project."

Please tick (✓) one answer:	
Strongly agree	Tend to disagree
Agree	Disagree
Tend to agree	Strongly disagree
Any comment:	

5 "I know how to get involved in (or who to contact for information about) the Ashton Hayes Going Carbon Neutral Project."

Strongly agree	Tend to disagree
Agree	Disagree
Tend to agree	Strongly disagree
Any comment:	

6 "Because of the project, I am now undertaking new environmentally-friendly activities."

Strongly agree	Tend to disagree
Agree	Disagree
Tend to agree	Strongly disagree
Any comment:	

7 "I'm interested in Climate Change"

Strongly agree	Tend to disagree
Agree	Disagree
Tend to agree	Strongly disagree
Any comment:	

13 Please tick one answer:

"I know someone who's involved in the Ashton Hayes Going Carbon Neutral Project."

True  False

14 Please tick one answer:

"None of my close friends/household are keen on environmentally-friendly behaviour."

True  False

15 "The cost of being more environmentally-friendly puts me/us off." (Please tick one answer):

Strongly agree	Tend to disagree
Agree	Disagree
Tend to agree	Strongly disagree
Any comment:	

16 Please can you say if there any other reasons not mentioned above why you/your household don't get involved in environmentally-friendly behaviour?

17 Is there anything that would help you to participate (further) in environmentally-friendly behaviour/such a project? YES/NO. If yes, please explain:

## SECTION 2 ABOUT YOU

We are trying to ensure we contact people from as wide a range of backgrounds, etc as possible so I'd like to ask you some details about you and yourself which are strictly confidential.

18 Gender (please tick):      Male              Female

19 How many people of these ages live in your house?

Age of the people	Number in your house
0 – 4 (preschool)	
Please say which preschool(s))?	
4-11 and at Primary School	
Please say which school (s))?	
11-18/At Secondary School/College	
Please say which School/College?	
19-24	
25-59	
60+	
75+	

20 Your educational background (please tick any which apply):

<input type="checkbox"/>	Left school at 14
<input type="checkbox"/>	Left school at 16
<input type="checkbox"/>	Left school at 18
<input type="checkbox"/>	First (undergraduate) degree/diploma
<input type="checkbox"/>	Postgraduate qualification
<input type="checkbox"/>	Professional study
<input type="checkbox"/>	Other: please state

21 What do you normally do for a living? (Please tick)

<input type="checkbox"/>	Student/trainee
<input type="checkbox"/>	Housewife/husband or carer
<input type="checkbox"/>	Unemployed
<input type="checkbox"/>	Unable to work because of illness or disabilities
<input type="checkbox"/>	Retired
<input type="checkbox"/>	If you have a paid job now, what do you do?

**SECTION 2 ABOUT YOU**

We are trying to ensure we contact people from as wide a range of backgrounds, etc as possible so I'd like to ask you some details about you and yourself which are strictly confidential.

18 Gender (please tick):    Male            Female

19 How many people of these ages live in your house?

Age of the people	Number in your house
0 – 4 (preschool)	
Please say which preschool(s)?	
4-11 and at Primary School	
Please say which school (s)?	
11-18/At Secondary School/College	
Please say which School/College?	
19-24	
25-59	
60+	
75+	

20 Your educational background (please tick any which apply):

<input type="checkbox"/>	<input type="checkbox"/>	Left school at 14
<input type="checkbox"/>	<input type="checkbox"/>	Left school at 16
<input type="checkbox"/>	<input type="checkbox"/>	Left school at 18
<input type="checkbox"/>	<input type="checkbox"/>	First (undergraduate) degree/diploma
<input type="checkbox"/>	<input type="checkbox"/>	Postgraduate qualification
<input type="checkbox"/>	<input type="checkbox"/>	Professional study
<input type="checkbox"/>	<input type="checkbox"/>	Other: please state

21 What do you normally do for a living? (Please tick)

<input type="checkbox"/>	<input type="checkbox"/>	Student/trainee
<input type="checkbox"/>	<input type="checkbox"/>	Housewife/husband or carer
<input type="checkbox"/>	<input type="checkbox"/>	Unemployed
<input type="checkbox"/>	<input type="checkbox"/>	Unable to work because of illness or disabilities
<input type="checkbox"/>	<input type="checkbox"/>	Retired
<input type="checkbox"/>	<input type="checkbox"/>	If you have a paid job now, what do you do?

22 Ethnicity: (please tick those which apply):

Racial Heritage: If you choose not to complete this section, please indicate here →		<i>I choose not to provide this information.</i> <input type="checkbox"/>	
<b>White</b>		<b>Asian and Asian British</b>	
<input type="checkbox"/>	British	<input type="checkbox"/>	Indian
<input type="checkbox"/>	Irish	<input type="checkbox"/>	Bangladeshi
<input type="checkbox"/>	Any other white background	<input type="checkbox"/>	Pakistani
		<input type="checkbox"/>	Any other Asian Background
<b>Mixed</b>		<b>Black or Black British</b>	
<input type="checkbox"/>	White and Black Caribbean	<input type="checkbox"/>	Caribbean
<input type="checkbox"/>	White and Black African	<input type="checkbox"/>	African
<input type="checkbox"/>	White and Asian	<input type="checkbox"/>	Any other Black background
<input type="checkbox"/>	Any other mixed background		
<b>Chinese or other Ethnic Group</b>			
<input type="checkbox"/>	Chinese		
<input type="checkbox"/>	Any other		
Disability: Do you consider yourself to be a disabled person?			
<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

23 Your housing situation and climate change:

23a Relating to your home in Ashton Hayes, do you (please tick):

<input type="checkbox"/>	Rent it from a private landlord
<input type="checkbox"/>	Rent it from a Housing Association
<input type="checkbox"/>	Own it (or buying with a mortgage) (either alone or as part of a household)

23b "My housing situation (that is, my answer to 23a) strongly influences me/us to reduce the amount of energy I/my household uses." (Please tick):

Strongly agree	Tend to disagree
Agree	Disagree
Tend to agree	Strongly disagree
Any comment:	

Please can you return this questionnaire to Ged Edwards in the stamped addressed envelope provided. **THANK YOU VERY MUCH!**



#### APPENDIX 4: PARTICIPANTS' QUESTIONNAIRE: QUESTIONS FOR PARTICIPANTS

1. In the last six months, have you and/or other members of your household regularly been involved with or attend any of the following village activities (please delete as appropriate):

	I regularly am involved in/attend ...	Members of my household are regularly involved in /attend....
Ashton Hayes Primary School	YES/NO	YES/NO
Other activities	YES/NO	YES/NO

- 2 Do you agree or disagree with the following statements (please tick)?

I do "environmentally-friendly" things because ....	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
... I've always lived this way."					
... I want to save money/don't want to spend money unnecessarily."					
... I'm concerned about environmental matters/Climate Change and want to "do my bit to help."					
... The Council asks me to (e.g. recycle)."					
... My friends/household encourage me to do it/keep going with it."					
... I think a community approach to tackling global warming is the best way and I try and do my bit to support it."					
Others (please say which):					

Continued...

3 Do you agree or disagree with the following statements (please tick)?

"I don't do (more) "environmentally-friendly" things because ...."	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
... I'm in a routine - I've always lived this way."					
... I have other more pressing or important things to attend to."					
... what I do will make no difference to Climate Change so I don't bother."					
... it's up to Governments to sort out."					
... until I know what I can do about it, I'll continue as I am."					
... I think all this Climate Change stuff is guess work and not worth me bothering about."					
... the cost of being more environmentally-friendly puts me/us off."					
... I feel like I'm being preached at so I just switch off."					
... I don't tend to get involved with things like this unless everyone does."					
Others (please say which):					

Please tick one answer:

4. "The Ashton Hayes Going Carbon Neutral Project has influenced me to become more actively involved in the life of the village."
<input type="checkbox"/> True <input type="checkbox"/> False
Any comment:
Continued...

5. "I feel proud to belong to Ashton Hayes because of the Going Carbon Neutral Project."

True  False

Any comment:

---

6. "None of my close friends/household is keen on environmentally-friendly behaviour."

True  False

7. Is there anything that would help you to participate (further) in environmentally-friendly behaviour/such a project?  
**YES/NO. If yes, please explain:**

8. What would you personally be unwilling to change to address Climate Change and please say why?

Continued...

## SECTION 2 ABOUT YOU

We are trying to ensure we contact people from as wide a range of backgrounds, etc as possible so I'd like to ask you some details about you and yourself which are strictly confidential.

9 Gender (please tick):      Male              Female

10 Your educational background (please tick any which apply):

<input type="checkbox"/>	Left school at 14
<input type="checkbox"/>	Left school at 16
<input type="checkbox"/>	Left school at 18
<input type="checkbox"/>	First (undergraduate) degree/diploma
<input type="checkbox"/>	Postgraduate qualification
<input type="checkbox"/>	Professional study
<input type="checkbox"/>	Other: please state

11 What do you normally do for a living? (Please tick)

<input type="checkbox"/>	Student/trainee
<input type="checkbox"/>	Housewife/husband or carer
<input type="checkbox"/>	Unemployed
<input type="checkbox"/>	Unable to work because of illness or disabilities
<input type="checkbox"/>	Retired
<input type="checkbox"/>	I have a paid job
Disability: Do you consider yourself to be a disabled person?	
<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

THANK YOU VERY MUCH!