

Dissertation

Public Perceptions of Alternative Energy Within Cumbria

Author(s): Tweddle, S

URL: <https://knowledge.lancashire.ac.uk/id/eprint/2648/>

Date: 2008

Citation: Tweddle, S (2008) Public Perceptions of Alternative Energy Within Cumbria. [Dissertation]

This document is made available to authorised users, that is current staff and students of the University of Lancashire only, to support teaching and learning at that institution under a <https://creativecommons.org/licenses/by/4.0/> licence. It may be shared with other authorised users in electronically or printed out and shared in that format. This cover sheet must be included with the whole document or with any parts shared. This document should not be published or disseminated via the internet, or in an analogue format beyond the network or community of the University of Lancashire. So, you may post it on the intranet or on the Blackboard VLE, but not on the openly accessible web pages. You may print it, or parts of it, and you may hand it to a class or individual as long as they are staff or students of the University of Lancashire. This does not affect any use under the current Copyright Law and permission may be asked via cllok@lancashire.ac.uk for uses otherwise prescribed.

Public Perceptions of Alternative Energy Within Cumbria

Simon Tweddle

Course

BSc (Hons) Environmental Management

Year

May 2008



Declaration

I declare that the following work is my own, and that the main text is of no more than ten thousand words:

Signed.....

S. Tweddle

Abstract

Energy production is one of the largest industries on the planet. Our lives are governed by the availability and access of electricity. We need energy to make the cogs of modern life turn. Climate Change has brought pollution and energy production to the forefront in recent times. In the past no notice was paid to the effect energy production was having upon the environment. Now however there are new emergent technologies that can harness energy from renewable sources, or produce Carbon free energy. The methods I will discuss in this dissertation will be wind power and nuclear energy.

This dissertation focus's on the public's perception of alternative energies within Cumbria. The research consists of primary quantitative data gathered from a questionnaire which was conducted at 3 separate sites around the county, and a series of interviews. The findings are placed into context in the scientific world by comparing the dissertation with similar published works on the subject. The results show the views of the public as regards there perceptions toward alternative energies. The results are then discussed with the themes and trends discovered being concluded in the final section.

Acknowledgements

I would like to thank all my friends and family who have helped me through University and made it the best years of my life so far. I would also like to thank the staff in the department for their help and assistance provided over the course of my degree.

Contents

1. Introduction.....	1
1.1 Background Information.....	1
1.2 Research Aims and Objectives.....	4
1.3 Overview of the Layout.....	5
1.4 Rationale.....	5
2. Literature Review.....	6
2.1 Nuclear Energy.....	6
2.2 Wind Energy.....	10
2.3 Summary.....	12
3. Methodology.....	13
3.1 Primary Research Data.....	13
3.2 Site Selection.....	13
3.3 Research Design.....	16
4. Results.....	19
4.1 Results From Questionnaires.....	19
4.2 Summary.....	27
5. Discussion.....	28
5.1 Introduction.....	28
5.2 Question Reasoning's.....	28
5.3 Discussion of Questionnaire Data.....	32
5.4 Discussion of Interview Data.....	34
5.5 Summary.....	38
6. Conclusion.....	40
6.1 Introduction.....	40
6.2 Principle Aims and Findings.....	40
6.3 Future Research.....	41
7. References.....	43

List Of Figures

Figure 1

Map of Study area.....15

Figure 2

Graph 1, Sex of People Questioned.....19

Figure 3

Graph 2, Age of those Questioned.....20

Figure 4

Graph 3, Number of Respondents from each area.....21

Figure 5

Graph 4, Are you concerned for the state of the environment?.....21

Figure 6

Graph 5, Do you think energy production put and unnecessary strain on the environment?.....22

Figure 7

Graph 6, Are you in favour of green/ alternative methods of energy production to help reduce the reliance on fossil fuels and safeguard the environment?.....23

Figure 8

Graph 7, Would you be in favour of the development of wind and nuclear power to meet the future energy needs of the UK?.....23

Figure 9

Graph 8, How would you feel if such developments were to be sited in Cumbria?...24

Figure 10

Graph 9, Would you be opposed if such developments were to be sited within your local area?.....25

Figure 11

Graph 10, Reasons for opposing the development.....26

Figure 12

Graph 11, Reasons for not opposing a development26

Figure 13

Graph 12, Overall, do you agree with the concept of alternative energies.....27

Abbreviations

BWEA	British Wind Energy Association
DTI	Department of Trade and Industry
NIMBY	'Not in My Back Yard'
RSPB	Royal Society for the Protection of Birds

1.0 Introduction

This dissertation studies the public's perception of alternative energies within Cumbria. The people questioned and interviewed come from a range of generations and backgrounds in order to get the most the representative sample of the areas opinions toward alternative energies. This chapter will provide a background for the work carried out and analysed in this dissertation, it will also introduce the aims and objectives of this work, provide an outline of the layout of the content of this thesis and provide a rationale for carrying out the work.

1.1 Background Information

Energy production is one of the most important industries in modern times. Many things we rely on to go about our regular daily business require electricity to function, without this supply of electricity we would struggle to survive and our lifestyles would be affected, without the energy provided for us we would fail to heat our homes or drive our cars. However energy production has been taken for granted, with little or no regard shown to the environment in the early days. Also fossil fuels were seen as an infinite source of fuels, as we all know now, fossil fuels are only a finite source, with many reports saying some reserves of coal, oil and gas may run out within our lifetimes.

Currently the UK's energy consumption is rising having increased 15% since 1970 (DTI, 2003: 16-17). The shift toward renewable energies is not primarily down to the

decrease in the amount of fossil fuels, it is down to the increased awareness toward the environment and the effects we are having upon it. As such the government has seen energy production as one of the ways that it can reduce emissions. Currently “about a third of our emissions of carbon dioxide come from electricity generation, the vast majority coming from coal and gas power plants” (DTI, 2007: 185). As such the aim was to provide 10% of Britain’s energy from renewable sources by 2010 (DTI, 2003: 16), however in 2002 only 3% of the UK’s electricity production came from renewable sources (DTI, 2003: 14).

There are many different types of renewable energies available; solar, wind, wave, tidal, geothermal, hydroelectric, waste to energy and biomass to name but a few. In this research I will however be focussing on the alternative methods favoured by the British Government. They are wind and nuclear power. The preference toward harnessing the power of wind was evident in the Energy White Paper of 2003 where it was mentioned as one of the most efficient and cost-effective ways to reach the targets set of 10% by 2010 (DTI, 2003: 46) and also in the 2007 white paper for energy where it highlights the progress being made and the sites of large onshore and offshore wind farms (DTI, 2007: 147). The coastline and topography of Cumbria was quickly identified as an ideal spot to site the turbines. According to the BWEA (2008) there are currently 100 operational turbines across 16 sites with a further 41 turbines awaiting planning permission across 8 sites.

The second method of energy production favoured by the government is Nuclear power. Looking at both the Energy White Paper of 2007 can see this, and the White

Paper for Nuclear Power published in 2008. Nuclear power accounted for 18% of the nation's electricity generation and 7.5% of the total UK energy supplies in 2006 and combined with renewable sources contributed 22% of our total electricity generation (DTI, 2007: 16, 129)

As Britain is moving towards a low carbon emissions future it is clear to see that the public have many questions and concerns. Due to the scale of the proposed developments support for the projects are vital. However in recent years fierce opposition from local residents and campaign groups has met many schemes for new wind turbines. Even though the idea of environmentally friendly energy production is widely embraced, when such a scheme is proposed near peoples homes their feelings can change greatly. This is known as NIMBY (Not In My Back Yard) syndrome. Meaning the people of the area may well be for the overall aim or objective of the scheme as long it is sited nowhere near them, or their local area. This study aims to achieve an insight into the views of the public and to try and find out if such attitudes are prevalent in the areas of county I am studying.

1.2 Research Aims and Objectives

In this section I will state the main objectives and aims of this dissertation. The primary aim of this dissertation will be answered by using the following secondary questions.

Primary Research Objective

- Do the public's perceptions of alternative energy vary from location to location across the county of Cumbria?

Secondary Research Objectives

- Does gender, education, age, etc... have a bearing upon the person's views of alternative energies?
- Extent to which NIMBYism is prevalent in key areas across the county
- Views of the Cumbrian public toward the current state of the environment and their concerns about climate change and global warming
- Extent existing structures may influence the peoples opinions, be it local people or those from further a field

1.3 Overview of the Layout

This dissertation contains 6 chapters. This chapter, chapter 1, the introduction. Chapter 2.0, the literature review introduces the key themes and other trends from sources related to this study. Chapter 3.0 is the methodology, which discusses the ways in which the data was gathered and interpreted. Chapter 4.0 is my results section in which all the data I had gathered was tabulated and put into graphs or charts for analysis. Chapter 5.0 is the discussion where the results gathered and interpreted in chapter 4.0 will be analysed and evaluated. Finally, in chapter 6.0, the conclusion, I will try to bring together all the trends and key issues.

1.4 Rationale

Due to the current demand on fossil fuels, the need to develop alternative energies is becoming more and more important. Due to the landscape and population density of Cumbria, where developments such as wind and nuclear power were to be proposed, the views of the public would have to be considered. There are currently no works published in the county. The aims of this study are to provide a valuable insight into the views of the public towards the subject matter.

2. Literature Review

With the amount of worry surrounding global warming, a shift away from fossil fuels as a means of energy production is being urged in order to cut down on CO₂ emissions. Carbon free methods of producing energy are now at the forefront of energy policy. There are numerous texts and journal papers written on the subjects of people's perceptions as well as on renewable energies and carbon free energy production. As mentioned in Chapter 1, the alternative energies I shall be looking at in this dissertation are Wind power and Nuclear power. Both are backed by the government as part of the next generation of energy production for the country, and both methods provoke a reaction from the general public, be it favourable or not.

This literature review will be split into 2 sections, one section focusing on Nuclear energy and the other on wind power. Firstly I shall review literature and previous studies undertaken on nuclear power then conduct the same analysis on wind power studies and literature.

2.1 Nuclear Energy

The general consensus toward nuclear energy is not positive. This could be due to fears surrounding the safety of nuclear fuels or the lack of education as to how nuclear power stations function.

Most people's perceptions of nuclear energy are provided or created from images of disaster and the media portrayal of the industry. However nuclear energy is one of the safest forms of energy production. Using figures from Cohen (1998: 1), it states

that the best scientific estimates were that nuclear power would cause an average of less than 10 deaths per year. Significantly less than the other far more widely accepted subjects, such as smoking. In the same document it also states that using a Probabilistic Risk Analysis, nuclear power would cause on average 0.02 deaths per reactor operating years as opposed to over 1000 times as many deaths from air pollution brought about by coal power plants providing the same amount of electricity. The reason this is not a more widely known fact is that according to Cohen (1998: 3), the media, both audio-visual and print, have never compared the health impacts of coal and nuclear power. This causes the public to tend to be dismissive of the potential future for nuclear energy and the benefits it may have.

One of the possible reasons for the tendency of the public to shy away from nuclear development could be down to a lack of education about the industry of nuclear energy and fuels. Most people's fears about nuclear energy are drawn from the incidents on Three Mile Island and the melt down at Chernobyl. These incidents however occurred in 1979 and 1986 respectively. This was still when the technology was in its infancy and not properly developed as it is now. Roberts, 1975 stated that the nuclear energy industry thought the best way to counteract the poor image the eyes of the public created was by providing information and education. Choi et al 2000, Viklund 2004, Sohn et al 2000, Yim and Vaganov 2003 and Cohen 1998 all agreed and backed up the theory that the best way to reach the public and alter their tainted image of the nuclear industry was through better education. Schools and the nuclear power stations themselves were noted as being the best sites to promote nuclear energy. In Choi et al (2000: 14) it was found that if the education level increases, the perceived risk decreases and the perceived benefit increases. The

increased levels of education would make the proposed nuclear options less widely opposed and more likely to be accepted. With the increased amount of knowledge of the nuclear industry the public will be able to use that knowledge to help change and improve their individual opinion and risk perception, as noted in Choi et al (2000: 14)

Without any education, the general public is forced into creating its own opinions and ideas on the great nuclear debate. But according to Sundstrom et al (1977), Clelland and Bremseth (1977) and Hensler and Hensler (1979) no relationships were found between information levels and support for opposing a development, it also showed that knowledge did not seem to affect attitudes toward nuclear energy. Some of the reasons for this could be the dates at which the studies were undertaken, the knowledge they possessed and the way the knowledge about the industry was passed on and taught to the public. Also the current day opinions are formed from the events of 3 Mile Island and Chernobyl as previously stated those events post date the studies undertaken by the aforementioned authors.

In the current climate as previously stated, public perceptions have changed due to high profile incidents across the globe. However as noted in Slovic (1998) and Douglas and Wildavsky (1982) the public has a broad conception of risk; whilst Yim and Vaganov (2003) state that different people attach different weightings to different assessments of risk. This could stem from the cultures of which the person being questioned came from. Another factor to take into account when assessing public perception is proposed by Choi et al (2000). It is that when the public assess risk they do not have sufficient statistical evidence, and as such their opinions will be

formed without the correct knowledge. Also sex can affect people's perceptions as well. According to Choi et al (2000: 13) women perceive risks of nuclear energy to be more existent and benefits to be less than as perceived by men. Taking all these factors into account it shows that to come up with a universal perception of the public in any one area is a difficult task. Any scheme would have to appeal to people of all cultures, sexes and ages.

Media, as already stated, has the ability to sway people's opinions, and offer a discourse that people, more often than not, believe. In Yim and Vaganov (2003) it states that the media can also act as an amplifier of any incident. In the paper, the example used is that of 3 Mile Island. Media reports caused people to respond by driving 100 miles away from the site, even though the meltdown was controlled and by no means possessed an immediate threat to people living in the near surroundings of the power station. In these cases the media may have the best of intentions as regards health and safety, but when it comes to informing the public about the facts of nuclear power as mentioned by Cohen (1998) the media standpoint may need to be changed. All of the journals studied employed some kind of questionnaire or survey based on primary research. Viklund (2004) employed a mail survey, in which they received a return rate of 66%. The problem with this method of research is that, as the return number shows, not all the people mailed will respond, and those who do respond will have either views strongly for or against, thus creating an imbalance in the validity of the data. Whereas the face-to-face questionnaire method, employed by the other primary researchers provided a 100% completion rate.

2.2 Wind Energy

Firestone and Kempton (2006:1) state that public opposition has derailed many land based wind farm proposals across the globe. Something that is very evident in areas of the UK and regions of Cumbria. Great Britain has the best available wind resources in Europe (McKenzie Hedger, 1995: 1). Combined with the level aims of the government and the EU to have “20% renewable energy sources by 2020” (Agterbosch et al, 2007: 2). The last 2 quotes show that wind power can have a big effect and contribution to the 20% aim for 2020, as set out by the EU and UK government. However public opposition has the ability to derail these schemes. It may be down to lack of knowledge about the technology and the effects of wind turbines. Studies undertaken have shown that the more public participation, the greater the acceptance of the scheme (Wolsink, 2005: 17). Due to these findings “planning approaches have dramatically evolved over the past few decades, passing from ‘top-down’ methods of thinking to more participative approaches” (Nadai, 2007: 2). Due to the current climate of worry surrounding the effects man has had on the environment, alternative and carbon free methods of energy production are receiving more funding and are getting increased exposure to the general public. As such the vast majority of the public in Europe and the United States of America are in favour of promoting wind power and its increased use as a more important method of energy production. This is noted in Krohn and Damborg 1999, Wolsink, 1999 and Re-Focus 2003. In the paper published in 1999 by Krohn and Damborg it states that 42% of Americans believe that renewables should receive the highest priority of continued funding. It also states that 79% of Canadians, 82% of Danes and 80% of the Dutch feel as though wind power should have a higher priority of use within the country’s electricity production methods. The same support can be seen in the UK

where according to Re-Focus 2003, 77% of the public are in favour of wind energy and 74% of British bill payers are in favour of the increased use of wind power.

According to some reports by Dr Barbara J Frey and Peter J Hadden (2007) living near to such wind farms has negative affects on both the health and welfare of people. It also causes a decrease in value of people's homes. Making it appear that if a wind turbine, or wind farm was to be situated near a home the only effects it could have on the area would be negative. However in the paper by Krohn and Damborg (1999: 3) it states that distance to the nearest turbine has no effect on people attitudes and that people living closer than 500 meters to the turbines would tend to be more positive about the technology than those who live further away from the site. One argument for this could be the amount of turbines in the area; if there are very low numbers of turbines in an area then people may be more receptive to the turbines and views toward them may alter, in this case positively. Where as if a house was situated near a large wind farm then the proximity to the site may negatively affect people's judgements. But in the paper by Krohn and Damborg (1999) it reads that the number of actual wind turbines in an area has no negative influence on people's attitudes toward wind energy. The Re-focus document of 2003 further emphasises the point on the people who live nearest the turbines showing more support for them. It says that a survey of people living round Scotland's 10 existing wind farms showed high levels of acceptance and overwhelming support for wind power, with the strongest support coming from those who live nearest to the wind farms.

Not all people are so in favour of harnessing energy from the wind using the wind turbines. In a press release in 2003 by the Countryside Alliance it stated that the number of land-based turbines planned by the UK government has never been realistic in terms of assisting them to the goals set by the EU of 20% renewable sources by 2020. Also, according to Krohn and Damborg (1999: 3), people living in the city areas tend to be more negative than those living in the countryside. It may be due to the romanticised view of the countryside held by the people who inhabit the city as suggested by Krohn and Damborg, or it may be due to lack of information regarding the schemes. As if a proposed site was to be situated near your home then you would seek out information regarding what possible effects it may have upon you, and with most potential developments being in the countryside then they would be the most knowledgeable on the subject.

2.3 Summary

As you can see from the above review of literature the study area of this dissertation is a very contentious topic, drawing in many different points of view and many different standpoints on each subject area. In Chapter 5 I will try to place all of my findings with the context of this literature review.

3. Methodology

3.1 Primary Data Research

The data collected was all of a quantitative variety. It was obtained through the use of a questionnaire and a series of individual interviews. The questions were written in such a manner as to provide the best quality and quantity of feedback from the public.

3.2 Site selection

To acquire a broad range of information regarding people's perception of alternate energy around Cumbria a broad range of sample areas was required. These sample areas would also ideally provide an interesting variety of viewpoints regarding the subject.

Also due to the size of the county the sample sites would have to be located across the county and not just focused in one small corner. These different locations may affect people's perceptions due to what happens in these areas day by day.

The areas I have chosen will hopefully provide me with a broad range of opinions surrounding the subject area. My first site was the city of Carlisle. Being the most heavily populated area of the county and the only city in the county, it would provide me with the opinions of a large percentage of the population. Also with the area being mainly urban, with little to no countryside areas within the city limits, the views of the population will provide me with a point of view that is not influenced by opposition groups and campaigns within the countryside.

Another of the questionnaire locations is situated in the west of the county. The area is already one of the few areas in the country that has embraced alternative energies so well. The area is home to Sellafield nuclear power station and many wind farms situated both offshore and on-shore. The perceptions of the public in this area may provide me with views that are in favour of the alternative energy future, being that they have lived alongside these developments for many years and have noticed only benefits to the area, be it jobs or other investments. Or it may provide me with views wholly against the idea due to previous experience with the schemes.

My final area of sampling will take place in villages around the periphery of the Lake District and within the centre and to the east of the county. These areas, especially the villages around Tebay have been targeted by companies as ideal places to site a wind farm due to their hilly topography, their high winds and also the ability to access the area due to its proximity to the M6 motorway. The views I may receive from these villages may be in stark contrast to other areas views and as such may be completely against such schemes due to the negative impact upon the landscape and the detrimental affect it will have upon the area. Potentially damaging the areas aesthetic qualities and also it may have a knock-on effect on the house prices in the area. However, it may also give me completely opposite perceptions and the response from the area may be in favour of such schemes.



Figure 1

(Source: www.thecumbriadiirectory.com)

Above is a map of the county. The areas of study are highlighted by a yellow circle which are shown on the map

3.3 Research Design

After choosing the area of study, I then embarked upon gathering information from many sources such as Friends of The Earth, Country Guardian, British Wind Energy Associated and British Nuclear Fuels to name but a few. These sources generated a great deal of data, which provided me with a great deal of background knowledge around the subject area, and it also gave me some interesting viewpoints. However to generate the information required for my area of study it was necessary to go out into the field and collect the data myself using a number of qualitative data collection methods.

The data collection technique used was a questionnaire coupled with a series of small-scale interviews to give me a more in-depth perspective of a persons view on a topic. The data was collected during the weekends as the general public were more likely to be about and more open to complete the questionnaire, as they may not be in a rush to get back to work or in a hurry to get somewhere. These techniques were implemented as they would provide me with the best range and amount of data within the period of time the research was undertaken.

The initial aim for the research was to gain equal amounts of data from all 3 sites of study. The questionnaire format proved easiest to get the views of the public as they took a relatively short period of time to complete when compared to an interview and were also not as involving. Due to the questionnaires it was possible to gain similar amounts of data in both the Carlisle and the West Cumbria area, but in the case of the villages along the M6 in the Tebay area it proved more difficult to achieve similar sample numbers as the previous areas. This may have been due to the relatively low

population numbers in the area, with it only being a collection of a few very small villages. Supplying friends and family with questionnaires who then in turn passed them on to someone else also generated questionnaire data. A data collection technique known as snowballing, where the last person to fill in a questionnaire did not know the first person in the chain.

Questionnaires were used as they provided me with the ability to gather information and opinions in the quickest time possible, seventy-five results were gathered in total for each area (less in the Tebay areas), had time not been a problem then more would have been gathered. The questionnaire gave me the ability to, at a glance, get a general overview of the public's views in a particular area, to see how many people were in favour of alternative energies and if they had any qualms with it. The questionnaire was composed of simple yes or no style questions. This however did not provide me with a detailed or in-depth insight into the public's views.

Valentine (1995) described the aim of using a questionnaire as to survey a representative sample of the population in order to make generalisations from the responses. Although a good way for obtaining general opinions Valentine said that interviews were a good way to make up the short fall, generating a rich detailed and multi-layered picture of the opinions of individual people, (valentine, G, 1995, cited in Flowerdew, R and Martin, D, 1997:111).

Interviews were carried out in order to account for the lack of depth of information the questionnaires provided. Finding participants to carry out the interviews proved to be very difficult, as it was hard to find a person with enough spare time to be

interviewed. Again the participants were found by snowballing. Initially interviewing family members they in turn recommended a friend to participate and thus the numbers escalated. The interviews took place in people's houses, my home and the pub, these locations brought about a relaxed and familiar environment, this created a friendly environment in which to talk, and be able to talk more freely and openly. This relaxed environment also gave a much more reliable insight into their views and opinions on the topic. The interviews all started with the same question, '*How do you feel about alternative energy in Cumbria?*' from there I let the conversation flow on to whatever came up, this ensured the interviewee did not feel pressured to answer a particular set of questions and allowed their true views to come out. Due to the time consuming nature of the interviews only 5 were carried out.

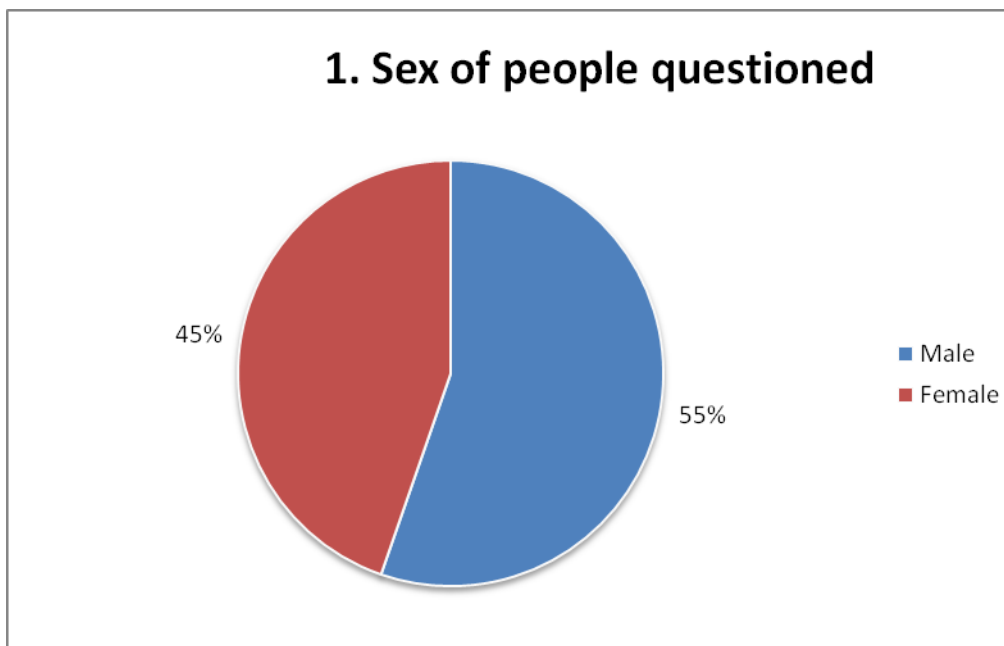
Had time not been an issue more interviews would have been carried out, approximately 20. However the interviews carried out did provide sufficient information to be deemed informative .The sample size for the questionnaires although not a particularly large sample still reflected the views of the people in the area. However if time had not been a problem then taking more questionnaire samples would have improved the data collection pool and gave a greater representation of the sample area.

4. Results

Once the data had been collected from the sample areas it was then tabulated and put into graphical form to allow the key trends to be noted and for conclusions to be generated.

4.1 Results from Questionnaires

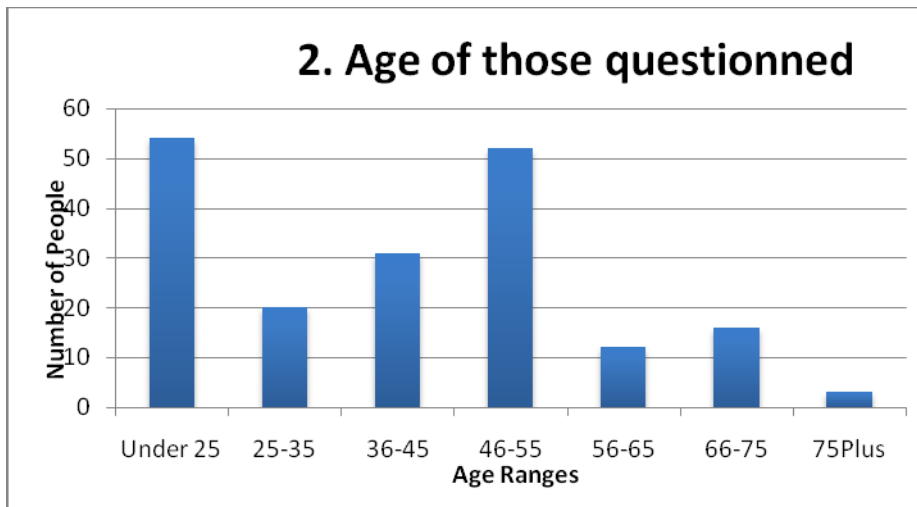
Figure 2



The graph shows that slightly more males completed the questionnaire, 55% compared to 45% of the people questioned who were female. The results are too close to prove that one sex cares more about the subject than the other.

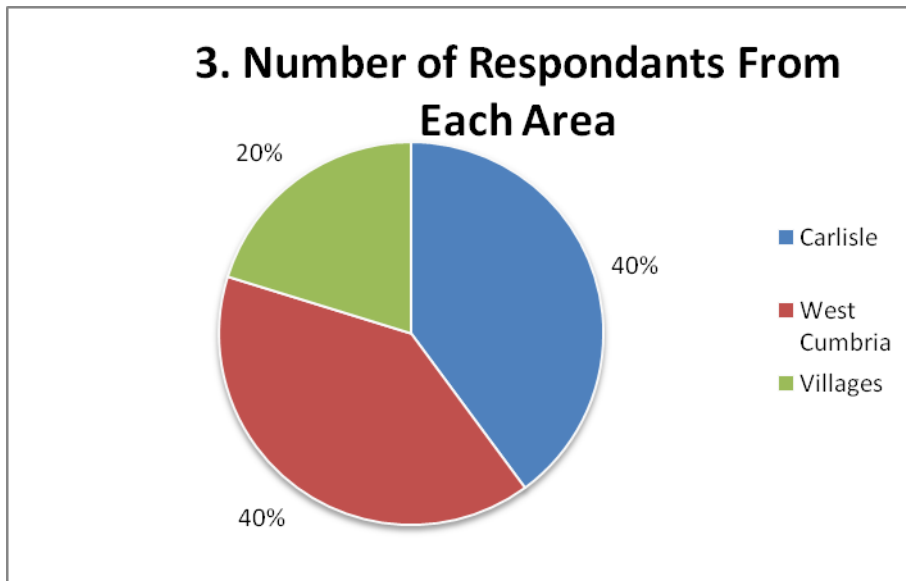
Figure 3

A graph to show the age ranges of the people who completed a questionnaire.



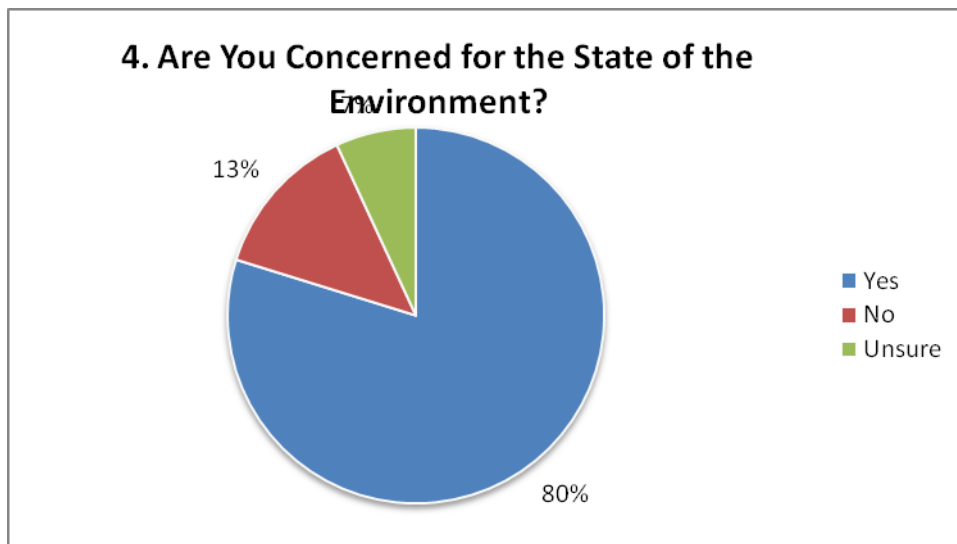
As the graph shows there was a relatively good spread of results with the majority of the respondents being in the under 25 and 46-55 age ranges. One of the reasons of the high amount of people in the under 25 range could be due to the increased emphasis on alternative energies from education and increased understanding of the technologies. The other 2 high responding ranges were 36-45 and 46-55. This could be due to fears of affects of climate change on their families and are interested in trying to safeguard their families' futures. The lowest category of response was the 75+ category. Because the survey was undertaken at the weekend in the town centre many people of that age range may not be about in town or may be able to get around.

Figure 4



Graph 3 shows the areas in which the samples were taken. Equal Numbers of data were gathered in both Carlisle and the towns in West Cumbria, unfortunately it was not possible to gather the same amount of data from the villages along the periphery of the Lake District due in part to the low population density of the area.

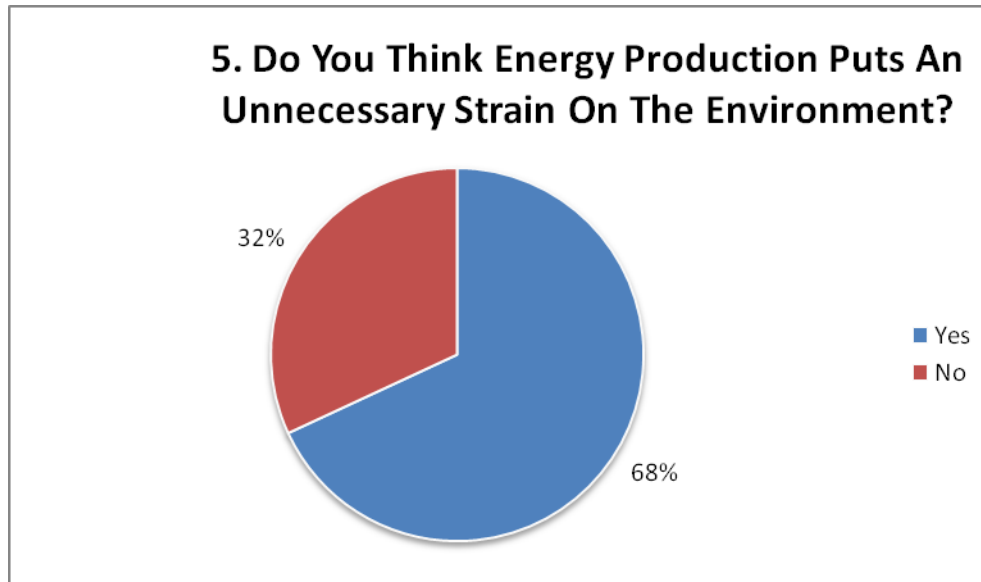
Figure 5



It is clear to see from the graph that the vast majority of the people questioned were concerned or at least had some regard for the state of the environment and the

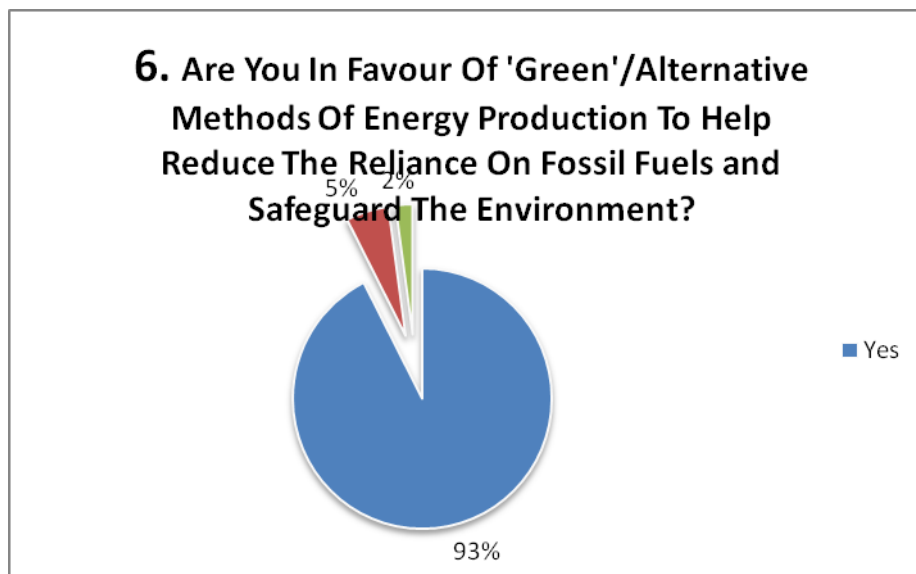
effects we may be having on it. Only 1/5 of the people questioned did not care or were unsure.

Figure 6



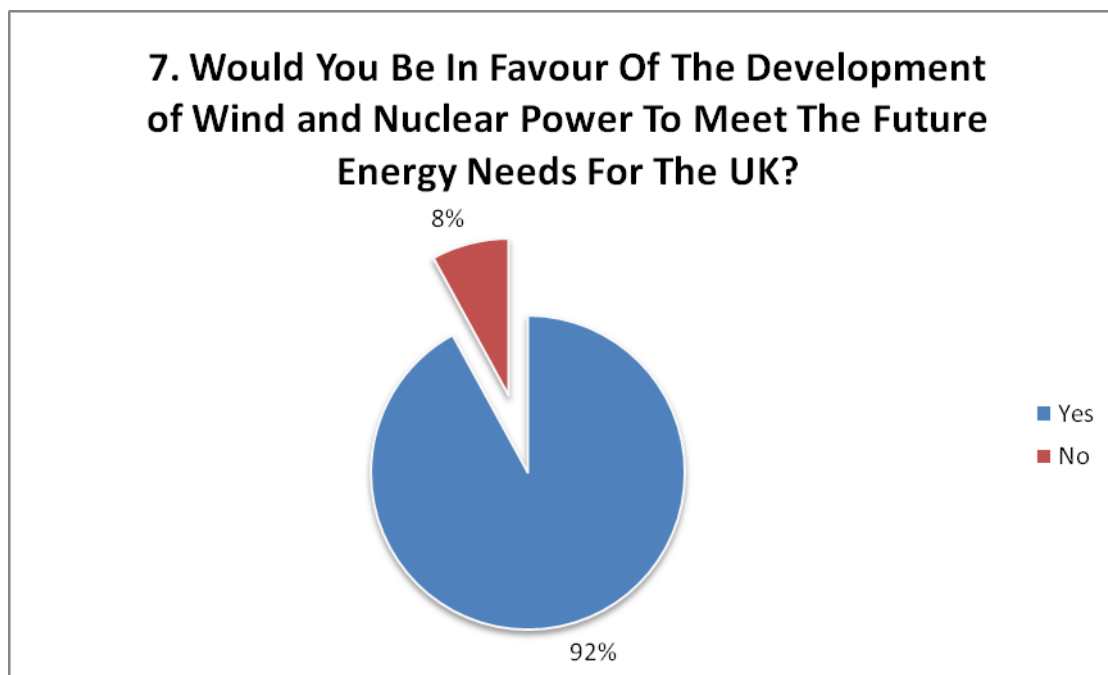
Again the vast majority of people agreed that current methods of energy/electricity production placed an unnecessary strain on the environment. However in comparison to the previous question more people were concerned with the state of environment. This may mean that a certain percentage of the sample surveyed is of the opinion that current electricity production methods have little effect on the environment or place at least an acceptable burden upon it.

Figure 7



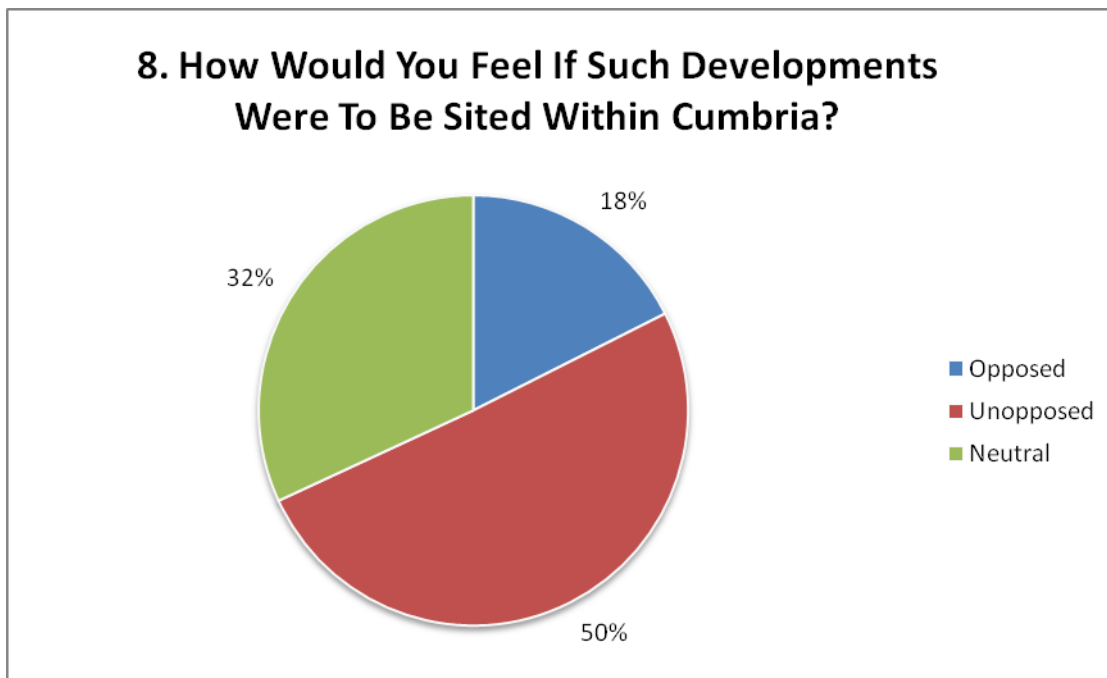
Almost everyone questioned was in favour of 'green'/alternative methods for energy production and reducing the reliance on fossil fuels. This chart shows that even some of those people who thought that no unnecessary pressure was placed on the environment with the current methods in use favoured 'greener' methods of energy production.

Figure 8



Almost exactly the same majority of people as in the previous chart would be in favour of the main alternatives being implemented to achieve a low CO2 energy future for the UK and to reduce the reliance on fossil fuels for power.

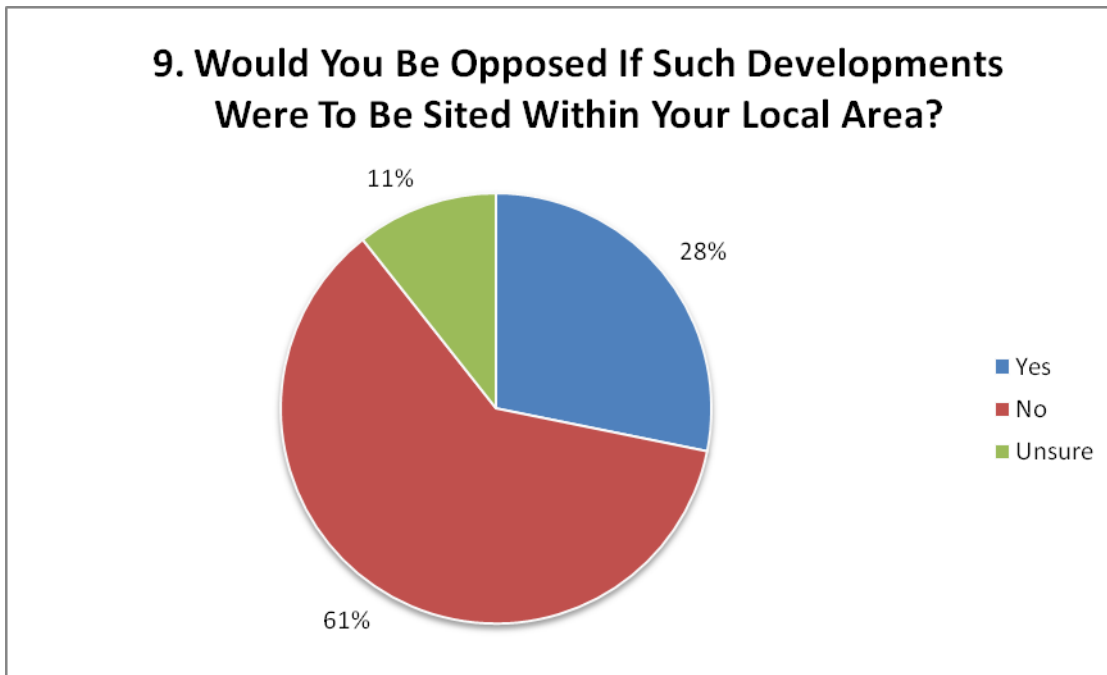
Figure 9



With

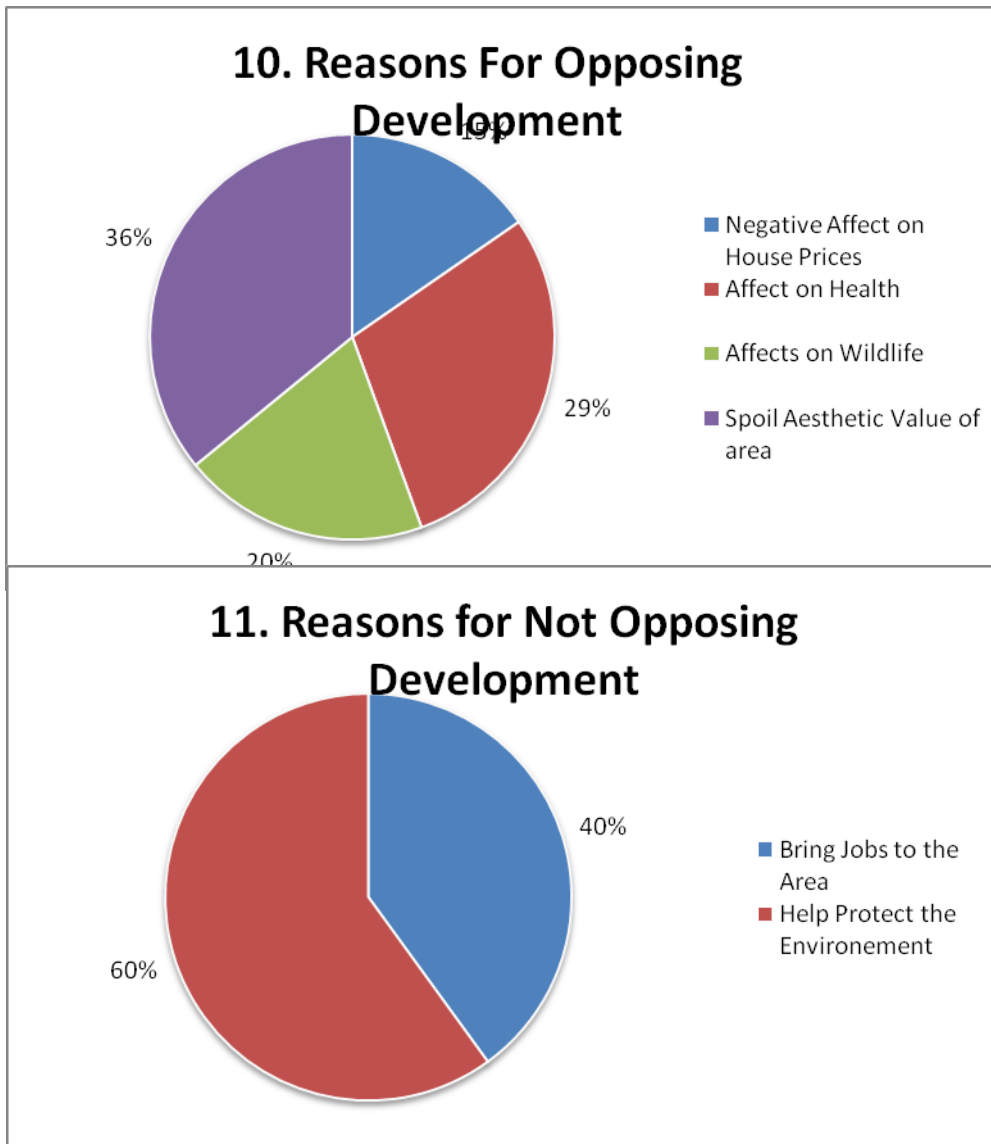
Cumbria having such a low-density population it makes it ideally cited for nuclear developments, as shown with Sellafield's location. Also it has the correct geographical features and wind speeds as to benefit most from wind power. As such the question was posed what would be the opinions of the local people if such a decision were to be made. Exactly half of the people survey said they would be unopposed if such developments were to occur within Cumbria, only 18% were opposed to the development, a similar number to the amount of people surveyed who were living in the villages around the Lake District.

Figure 10



Almost 2/3's of the people surveyed said they would have no qualms with a development being placed within their local areas. Some people from the west Cumbria area said that they would welcome any development with open arms, as it will bring jobs to the area, which are desperately needed for the local economy. Just over a quarter of the people surveyed said they would oppose any sort of development, with 11% unsure, most of whom said they would wait for more information and assess the situation nearer the time.

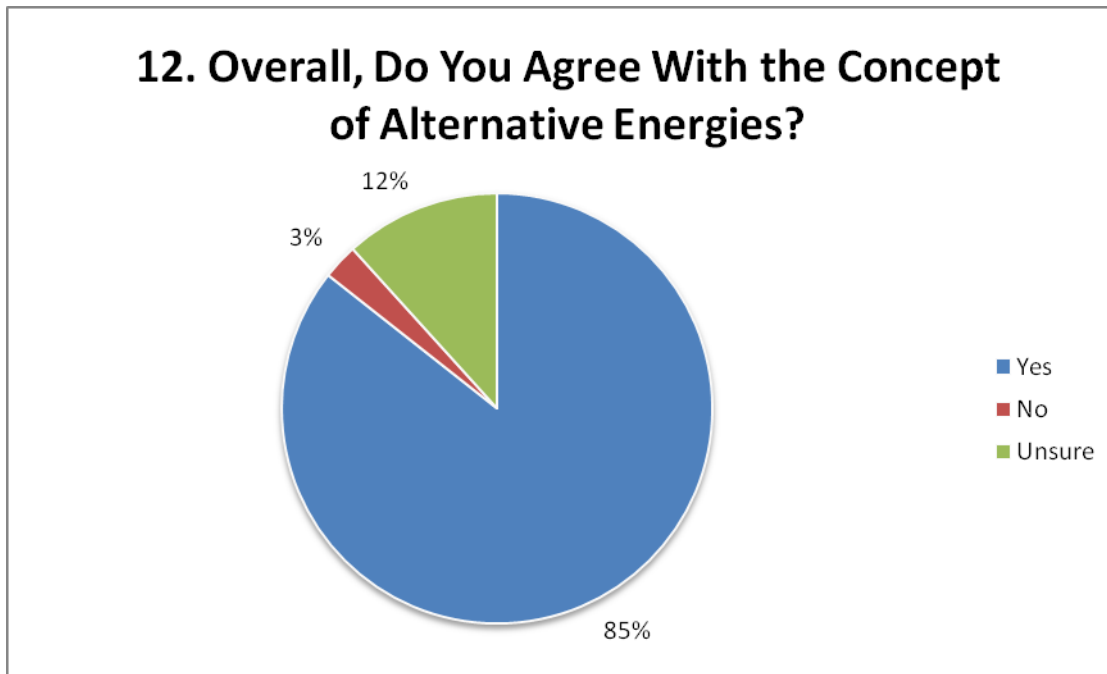
Figures 11&12



After answering the previous question, either favouring a proposed development, or opposing one, and extra question was asked in order to try to find out the reasons behind such views. One of the main reasons for opposing a development would be the affect it would have upon the scenic value of the area and the affects it may have on the health of any person nearby. Then the affects wit may have to local wildlife and finally the affects on house prices. The main reason for approving of a

development was down to the need to help safeguard the environment whilst not far behind was bringing jobs in to the area and helping benefit the local economy.

Figure 13



The final question was asked to assess the degree of acceptance toward alternative energies and to see if any bias was evident during the questionnaire. Again the vast majority of the people interviewed were in favour and agreed with the overall concept of alternative energies with only 3% being against them and 12% unsure.

4.2 Summary

This chapter has shown how the questionnaires have allowed for general observations of the public's perceptions toward alternative energy within Cumbria and also displayed many themes and key trends. In some cases the split in views is very even, in some not so, all of this will be discussed in chapter 5.

5.0 Discussion

5.1 Introduction

As mentioned in the introduction, this section will look at data gathered from the questionnaires carried out in the field and from the interviews conducted, and will examine the public's perceptions of alternative energy within Cumbria. The data collected will be analysed in 2 separate sections. The first part will analyse the data gathered from the questionnaires and the second will look into the data obtained from the interviews. The structure of the questions will be analysed to give an insight as to why such a question was asked, the section will also discuss the results from chapter 4.0 by explaining the relationships between the trends found and the scientific data available, to place the study into an academic context.

5.2 Question Reasoning's

This section will individually look at each question included in the questionnaire and analyse the reason for choosing the question and the outcomes it may provide

5.2.1 Sex of the questioned

This question was included in the questionnaire to see if any particular sex seemed more responsive to the questionnaire and to see which sex cared more for the environment. As in the paper by Krohn and Damborg (1999: 4) they cite the work of Anderson et al (1997), which states that men viewed something more positively it became less of a perceived inconvenience.

5.2.2 Age of the questioned

This was again included in the questionnaire to see if any particular age bracket of people had a differing opinion to any others and then a reason for the opinion could then be sort out. Also in the work by Anderson et al (1997) in Krohn and Damborg (1999: 3) stated that the middle-aged people questioned had the greatest dislike to the noise of the wind turbines, and thought it would be interesting to see if the same opinions carried themselves to wind and nuclear power in general.

5.2.3 Area of the questioned

This question was included to account for the location of the person interviewed be it from the city, the towns of west Cumbria or the villages bordering the Lake District National Park. It was also asked in an attempt to gain an insight for the people of the region as a whole, and to see if one person's from the areas views were representative of the whole area. Again from the paper produced by Anderson et al (1997) in Krohn and Damborg (1999: 3), it stated that people living in city zones tended to be opposed to wind power than the people who lived and worked in the countryside. As said in the article it may be due to the romanticised view of the countryside held by those who live in the city, and the question was asked to see if such views were the same in Cumbria and applied to nuclear energy as much as wind energy.

5.2.4 Concern for the state of the environment

This question was asked to try to gauge people views on the environment and the level of concern they show for it.

5.2.5 The amount of strain placed on the environment due to energy production

This question was included in the questionnaire as a way of trying to assess the public's opinions of the impact of energy production on the planet and its effects towards Global Warming

5.2.6 Views on alternative/ 'green' methods of energy production to help remove the strain on the environment

This question was included as a means of trying to gain an insight into the eyes of the public toward a shift away from the dependency of fossil fuels toward a carbon neutral or carbon free method of energy production.

5.2.7 Views toward Wind and Nuclear energy to meet the energy needs of the UK

This question was included within the questionnaire as a way of assessing if the plans outlined by the government in its energy white papers of 2003 & 2007 carry public favour and if implemented would not provoke wide scale opposition.

5.2.8 Feelings if such developments were to take place within Cumbria

This question was included within the questionnaire to see if the opinions of the public changed if such developments were to be sited within Cumbria. Would opinions toward it change and what effect would NIMBY attitudes have?

5.2.9 Feelings if such developments were to take place within the local area

Again this question was asked for the same reasons as the previous question but focused the area the questioned lived in. Would the opinions of the people who agreed to the developments within Cumbria change if a potential development were to be located nearer there home? Would the NIMBY attitudes become more prevalent or would they reside?

5.2.10 Reasons for opposing a potential development

This question was included to provide reasons for opposing the development. Be it loss of aesthetic value of the area or the possible affects on health. This question allows an insight into what values are placed on the surrounding landscape, habitat and well being of the people living in the area. It would also be possible to see if these assessments of the area tied in with documented NIMBY attitudes.

5.2.11 Reasons for not opposing a potential development

This question was included for the same reason as the previous question. It provides an insight to the attitudes of the public toward the reasons for not opposing a development, and provides a view of there beliefs. They may want to help protect the area or it may be they want more jobs for the local peoples.

5.2.12 Overall concept of alternative energies

This question was asked to see if the people questioned approved to the general concept of alternative energies and to see if anyone was strongly opposed, and to see if there views came up in the final data set of results.

5.3 Discussion of Questionnaire Data

From the questionnaires gathered and then interpreted in the previous chapter several themes became apparent. This section will aim to analyse these themes and explore them further.

5.3.1 Effect on the environment

The vast majority (80%) of the people questioned were concerned for the state of the environment and of that 80%. With over two thirds of the people questioned (68%) thought that the current methods of energy production placed an unnecessary strain upon the environment. Almost everyone questioned (93%) was in favour of alternative 'green' or environmentally friendly ways of producing electricity with (92%) of the people questioned in favour of wind and nuclear energies, as backed and promoted by the government, to provide an alternative future for the UK.

5.3.2 Development

Of the people questioned, 92% of the recipients were in favour an energy future compromising of wind and nuclear power sources. Once asked there opinions on if such a development were to take place in Cumbria the response was exactly 50% of those questioned said they would not oppose any development if it were to occur within Cumbria, with that figure increasing to 61% if the development were to take place within there local area. Of the 61% of the people who would not oppose a development within there local area the main reason for such a development was split 60:40 toward protection for the environment, With the 40% saying that it would bring jobs to the area and therefore boost the local economy.

Only 18% of the questioned were against any sort of development within Cumbria, with 32% unsure or undecided on their standpoint. When the question of the development being in the local area the statistics changed with 28% of people saying they would oppose a development near their homes and only 11% undecided. The increase of people who would oppose the development if it was within their local area as opposed to if it were elsewhere in the county prove there to be a population within the county who hold NIMBY views. The 28% of people who opposed a development in the local area the reasons for doing so were split almost evenly, with the most people (36%) saying they would oppose on the grounds of the affects it may have on the aesthetic value of the land. Second most important was the affect it might have upon health (29%) then the affects on wildlife (20%) and finally a negative impact upon house prices (15%). The affect on the aesthetic value of the area was primarily aimed toward the installation of wind power, as most wind developments are visible for miles around.

5.3.3 Effects of Pressure Groups

Some of the views shown by the respondents of the questionnaire may have been influenced by outside organisations or pressure groups such as Greenpeace, Friends of the Earth, Country Guardian and Friends of the Lake District. Organisations such as the Country Guardian are fierce opponents of wind power generation and have opposed it since they were first founded in 1991. From the country guardian (2000:7) it states that a 'wind farm is an industrial site of vast proportions and a turbine is a huge and noisy machine.' Quotes like this from key groups can affect the views of the public, and more specifically the members of the public who do not understand or know all the facts about wind power. One of the key

reasons behind peoples opinions to oppose a potential development was the effects it may have upon wildlife in the area, be it possible effects of wind turbines on birds, or the effects a nuclear power station may have upon the land surrounding the plant. The pressure groups and journal authors have also investigated the potential effects on wildlife. Macalister (2003: 1) states that the RSPB have opposed the development of offshore wind farms as they pose a threat to the bird life in the area, which may be of international significance to the population of a particular bird species. The effects of the turbines blades and nuclear power stations may have been influenced by the pressure groups and by key quotes taken from academic journals.

5.4 Discussion of Interview Data

5.4.1 Introduction

A total of 5 interviews were conducted as mentioned in chapter 3, an example of an interview tranzscript can be found in appendix B. The key theme from most of the people interviewed was that of a need to protect the environment and combat climate change, these views were shared by all of the interviewees apart from one. The key trends gathered from interviews will be discussed and analysed in this section.

5.4.2 NIMBY attitudes

As seen in the previous section, there was an example of NIMBY views being shown toward potential developments in the local area to that of the person questioned. NIMBY or Not In My Back Yard views are displayed when a person is in favour of a particular concept or proposal however would not like it any where near there homes. This was evident in the difference between the 2 charts showing the opinions

when developments were mooted for Cumbria and then the local area. As noted in Krohn and Damborg (1999) studies by Gype (1995) showed that NIMBY attitudes and public resistance is shown in situation such as wind power development, nuclear power proposals and even the construction of new motorways.

'I am concerned for the environment; however I would not want any proposal to be near my home and family'

(Male 2, 2008).

This individual had lived and grown up in the area for approximately 20 years. As such his views on such a development may have been seeded out his views of the area. He will have known the area for most of his life and the image of how it is in his mind. He might not like such images of his area to be altered by industry due to the negative impact it may have upon the area and the effects it might have upon the landscape. The impact may be an effect on house prices, which was one of the reasons identified by the people questioned as to their reasons to oppose a development in the area. Also mentioned was the effect it may potentially have on the health of the local people, due to any development being industrial in nature a degree of noise is inevitable which many people feared would disrupt there lives.

'Turbines are an eyesore, a blot on the landscape'

(Male 2, 2008)

'Any development would block my view of the landscape, a view which I paid for when buying this house. Should I not have a say in whether or not they are obtrusive?'

(Female 1, 2008)

From the views of these 2 people it is obvious that any potential development would cause controversy, as it would provide an eyesore on a view treasured by the residents who live there. This was mirrored by the views of the people questioned in the questionnaire as loss of aesthetic value came highest in reasons a development would be opposed.

'I have spoke to people who lives in West Cumbria, near sellafield and the wind turbines they have there. They have told me that the noise produced can be intolerable at times; it might come directly from the turbine or the plant. But the noise produced by the people who work there, coming and going. I would not like to be any where near that'

(Male 1, 2008)

These views have been passed on to this gentleman by a person who has first hand experience of such developments being located near there home. However these views may have exaggerated by the person who spoke to the interviewee, and my not be a true representation of the reality of such developments being situated in the local area.

5.4.3 Benefits

‘As seen with Sellafield any potential development here will provide hundreds of jobs to area, which would be very warmly welcomed’

(Male 3, 2008)

‘Bringing jobs to the area would boost the local area so much, and provide a lot more money to the area’

(Female 2, 2008)

As you can see from the quotes taken the interviews, the boost the economy of the local area, due to any sort of development would be welcomed. It would provide jobs, bring people to the area. These views are very similar to the views of West Cumbria when the initial development of Windscale (later Sellafield) was first planned. There was initially a murmuring of disapproval, but once the amount of jobs it would bring to the area were announced the local people became more accepting of such a development. A development anywhere in the country on the scale of a nuclear development would encounter opposition over health and safety and many other things; however the amount of money being placed into the area with jobs and so on acts as a compensation of sorts to the local residents.

Not all people interviewed shared the same sentiment toward the prospect of any sort of development.

‘Any development of any sort of alternative energy, would bring in specialist builders and tradesmen, and not use any of the local workforce’

(Male 1, 2008)

'If wind development in the area got the go ahead then it would not benefit the local area in any way, they would not use our workforce at all. They wouldn't even compensate us for the loss of views in any way, not even a reduced electricity rate!'

(Male 2, 2008)

No matter what were to happen in any area there would always be a degree of criticism of the development. But as noted previously, studies have shown that acceptance of any scheme become more positive once it has been developed and running with out problems for a few months. It would be interesting to see if any such development were to take place what these people would say if the same interviews were to take place once a scheme had been implemented in the area.

5.5 Summary

One of the key themes and trends to take from this section is the positive attitudes to climate change and the views toward alternative energies. The vast majority of people questioned showed no opposition to an alternative energy development in their county or area. However NIMBY attitudes were detected and analysed and even explored further through one of the interviews. The questionnaires provided a wide spectrum of views from the general public, and from them views generalisations were made. The gaps that were evident from the questionnaire data were filled using the data from the interviews, which filled most areas. Overall, combining the data gathered from the questionnaire of the general public and the data gathered from the interviews it provides a snapshot of the views of the people within the county's views

at that particular time. Chapter 6 draw conclusions from this data and place it into context with works already undertaken.

6.0 Conclusion

6.1 Introduction

From the data presented in chapter 4 combined with the key trends, issues and themes discussed in chapter 5 the primary and secondary aims of the dissertation were successfully analysed. The aims were to try to assess the views of the people of the county and see if one areas views were different with that of another area or were opinions on the topic similar across the county; it also showed the apparent evidence of NIMBY views in areas of the county and it also showed and highlighted the general concern for the environment and a willingness to try to combat climate change.

6.2 Principle Aims/ Findings

To assess the public perception of the alternative energies, the principle research aim, it is first necessary to interpret what the 'public' is and what is meant by perceptions. The general public is viewed and categorised as people who are not specialists in the area of study. To make the study fair and to gain a true perspective of the views of the public, no one who maybe regarded as a specialist on the subject was questioned. The sample areas, as mentioned in chapter 3, were located across the county in 3 different locations in order to try to gain a representative sample of the views of the public within each sample site and local area.

Perceptions take in the effects of the local area, exposure to certain literature and media as well as the cultural background of the questioned person. All these separate things contribute to building up an individual's perception of a topic.

From the themes analysed in chapter 5, it can be concluded that the data gathered in the questionnaires and from the interviews correlated provided an interesting snapshot of the views of the area at the time the study was undertaken. From the research it is clear to see that there is a large amount of support for the protection of the environment and an awareness of the effects we are having upon it. The same level of support also applies to the public's opinions regarding alternative energies, in particular the views toward wind power and nuclear energy. There was evidence of NIMBY attitudes in the county as many people questioned might have approved of the developments within the county but not if they were situated in their local area. These views were further emphasised with the interviews that I conducted. However the reasons for rejecting any development were provided and it is possible to see the case from the side of the opposition of such large-scale projects.

One of the secondary aims of the dissertation was to try to detect any NIMBY views across the county; these views were detected but were not as widespread as initially thought. As shown by mentioned authors, such as Krohn and Damborg, NIMBY views will be evident in any scheme as there will always be people who disagree a proposal. However due to the views gathered any proposed scheme would have the support of the people in and around the county.

6.3 Future Research

If further research was to be carried out into the subject then there are a few things that would of benefit to any future researcher. One of the main problems I encountered was time. If more time was available over the course of the study then, more data could have been gathered and interviews conducted as stated in chapter 3. The techniques used for future research could look at possibly conducting a series of focus groups to analysed and view the interactions of different people with opposing views on the subject. The questionnaires could possibly be extended with more questions to try to gain an even broader and deeper insight in to the views of the public. Finally if the amount of interviews were to increase it could only be beneficial to the process as it would provide more information, reveal more issues and also further enforce or dismiss and other viewpoints found by the questionnaires or focus groups.

7. References

Agterbosch, S., Meertens, R.M., Vermeulen, W.J.V., 2007, The Relative Importance of Social and Institutional Conditions in The Planning of Wind Power Projects, *Renewable and Sustainable Energy Reviews*, 2007

BWEA, Undated, *List of Operational Wind Farms in the UK*, <http://bwea.com/ukwed/operational.asp>, Date Accessed 27/04/08

BWEA, Undated, *List of Wind Farms awaiting Planning Permission*, <http://www.bwea.com/ukwed/planning.asp>, Date Accessed 27/04/08

Choi, Young Sung, Jong Seok Kim and Byung Wook Lee, 2000, Public's Perception and Judgement on Nuclear Power, *Annals of Nuclear Energy*, **27**, Issue 4, Pages 295-309

Clelland, D. and Bremseth, M., 1977, *Student Reactions to Breeder Reactors*, Department of Sociology, University of Tennessee, Knoxville

Cohen, B.L., 1998, Public Perceptions Versus results of Scientific Risk Analysis, *Reliability Engineering & Safety System* **59**, Issue 1. Pg 101-105

Country Guardian, 2000, *The Case For Wind farms Examined*, <http://www.countryguardian.net/case.htm>, Date Accessed 27/04/08

Countryside Alliance, 2003, *Offshore Wind Power Is An Acceptable Option for Rural Communities*, Countryside Alliance Press Releases, <http://www.countrysidealliance.org/news/03/030714wind.htm>, Date Accessed 27/04/08

Cumbria Directory, Undated,
http://www.thecumbriadirectory.com/Cumbria_Map/images/Cumbria.gif, Date
Accessed, 27/04/2008

Douglas, M and Wildavsky, A., 1982, *Risk and Culture*, University California Press,
Berkley and Los Angeles, California, 1982

Department of Trade and Industry, 2003, *Energy White Paper, Our Energy Future-
Creating a Low Carbon Economy*, TSO, Great Britain

Department of Trade and Industry, 2007, *Energy White Paper: Meeting The Energy
Challenge*, TSO, Great Britain

Firestone, J. and Kempton, W., 2006, Public Opinion About Large Offshore Wind
Power: Underlying Factors, *Energy Policy* **35**, Pages 1584-1598

Frey, Dr Barbara J. Hadden, Peter J. (2007), *Noise Radiation From Wind Turbines
Installed Near Homes: Effects on Health*,
www.windturbinehealthhumanrights.com/wtnhhr_june2007.pdf, date accessed
20/2/2008

Hensler, D.R and Hensler, C.P, 1979, *Evaluating Nuclear Power: Voter Choice on
the California Nuclear Energy Initiative*, Rand, Santa Monica, California, 1979

Krohn, S. and Damborg, S., 1999, On Public Attitudes Toward Wind Power,
Renewable Energy, **16**, Pages 954-960

Macallister, T., 2003, *Birdsong Throws Wind farm Plans into Chaos*, The Guardian
Online, March 3, 2004,

<http://www.guardian.co.uk/environment/2004/mar/03/energy.greenpolitics>, date accessed 27/04/08

McKenzie Hedger, M., 1995, Wind Power: Challenges To Planning Policy In The UK, *Land Use Policy* **12**, Pages 17-28

Nadai, A., 2007, "Planning", "Siting", And The Local Acceptance Of Wind Power: Some Lessons From The French Case, *Energy Policy* **35**, Pages 2715-2726

ReFocus, 2003, Scottish Survey Shows Firm Public Support For Wind, *Refocus*, **4**, Issue 5, Page 14

Roberts, R., 1975, *Public Acceptance of Nuclear Energy- The Government's Role*, Speech to the Atomic Industrial Forum, San Francisco, November 1975

Slovic, P., 1998, The Risk Game, *Reliability Engineering and System Safety*, **59**, Pages 73-77

Sohn, Ki Yoon, Jee Wong Yang and Chang Sun Kang, 2000, Assimilation Of Public Opinions In Nuclear Decision-making Using Risk Perception, *Annals of Nuclear Energy*, **28**, Issue 6, Pages 553-563

Sundstrom, E.P., Costimiris, E.J., De Vault, R.C, Powell, D.A., Lounsbury, J.W., Mattingly Jr, T.J., Passino, E.M, Peele, E., 1977, *Citizens Views About the Proposed Hartsville Nuclear Power Plant: A survey Of Residents Perceptions in August 1975*, Oak Ridge National Laboratory, Oak Ridge, TN.

Valentine, G., 1995, Cited in Flowerdew, R. and Martin, D., 1997, Using Interviews as a Research Methodology, *Methods in Human Geography, A Guide For Students Doing A Research Project*, Longman, Malaysia, 110-126

Viklund, M., 2004, Energy Policy Options- From the Perspective of Public Attitudes and Risk Perceptions, *Energy Policy*, **32**, Issue 10, Pages 1159-1171

Wolsink, M., 1999, Wind Power And The NIMBY-myth: Institutional Capacity And The Limited Significance of Public Support, *Renewable Energy* **21**, 49-64

Wolsink, M., 2005, Wind Power Implementation: The Nature of Public Attitudes: Equity and Fairness Instead of 'Backyard Motives', *Renewable and Sustainable Energy Reviews (2007)* **11**, Pages 1188-1207

Yim, Man-Sung and Vaganov, P.A, 2003, Effects of Education on Nuclear Risk Perception and Attitude: Theory, *Progress in Nuclear Energy*, **42**, Pages 221-235

Appendices

Appendix A

Example of a Completed Questionnaire

A Completed Questionnaire

Questionnaire

Please Tick or mark as appropriate. Thank You

1. Sex

Male...y....

Female.....

2. Age

Under 25...y....

25-35.....

36-45.....

46-55.....

56-65.....

66-75.....

75 Plus.....

3. Where do you live?

City.....

Town.....

Village...y....

4. Are you concerned for the welfare of the environment?

Yes.....y.....

No.....

Don't Care....

5. Do you think energy production puts an unnecessary strain on the environment?

Yes...y....

No.....

6. Are you in favour of 'green'/alternative methods of energy production to help reduce the reliance on fossil fuels and help safeguard the environment?

Yes...y...

No.....

Unsure.....

7. Would you be in favour of the development of wind and nuclear power to meet the energy needs for the UK?

Yes...y...

No.....

8. How would you feel if such developments were to be sited within Cumbria?

Opposed.....

Unopposed...y.

Neutral.....

9. Would you oppose to the developments if they were to be situated within your local area?

Yes.....

No...y...

Unsure.....

10. If you are not opposed to the development then please state why

Bring Jobs to the area...y....

Help Protect the environment...y....

Other (Please Specify).....have lived 15 miles from sellafield all my life and it is a big employer. More job opportunities are needed in Cumbria

11. If you are opposed to development then please state why.

Negative Affect on house prices

Affect on Health

Affects on Wildlife.....

Spoil aesthetic value of the area.....

Other (Please Specify)

12. Overall do you agree with the concept of alternative energies?

Yes.....y

No.....

Unsure.....

Appendix B

An example of the an interview transcript

Interview: Male 3

Male three has lived around West Cumbria for all of his life and many of his family are employed by Sellafield or have links with wind turbine maintenance.

'As seen with Sellafield any potential development here will provide hundreds of jobs to area, which would be very warmly welcomed. Having lived here for all of my life I have seen the impacts it can have on the area. Not only that I have benefited from what it contributes to the local area by providing jobs and money for the local people'

'The effect we are having on the planet is clearly evident with increases in hazards happening around the globe and the rising temperature. Is it not our job to help protect the environment for our kids and not leave them with all the damage and rubbish we have left them? I know if it was the other way round I would expect someone to have done something about it.'

'Don't you think that wind turbines are beautiful? Loads of people that I have spoke to agree, they don't see them as an eyesore. They are not as scenic as the existing views but they are not ugly by any means. When people say that they do not operate enough and are off most of the times obviously have never been round here as to me the wind never seems to stop here!'

'With Sellafield currently being decommissioned any future development of nuclear energy would be greatly welcomed around here most of the people of my age have grown up with it , my friends an family all worked there. If the there were to be new generation of nuclear power plants then there is a ready made work force just waiting for it here'

Appendix C

Health and Safety Form

Ethics Form