

The role of education and schools in shaping energy-related consumer behaviour



energy saving trust®

The Energy Saving Trust

The Energy Saving Trust was established as part of the Government's action plan in response to the 1992 Earth Summit in Rio de Janeiro, which addressed worldwide concerns on sustainable development issues. We are the UK's leading organisation working through partnerships towards the sustainable and efficient use of energy by households, communities and the road transport sector and one of the key delivery agents of the Government's climate change objectives.



Contents

The Energy Saving Trust	2
Executive Summary	4
Introduction.	6
Part 1: Approach	10
1.1 The selection of behavioural subject 'areas'	11
1.2 Education and behaviour change	12
Part 2: Context	13
2.1 What are energy-related behaviours?	13
2.2 Barriers to sustainable energy	17
2.3 Delivering energy-related behaviour change – the policy context	20
2.4 Schools and the delivery of energy-related behaviour change	22
Part 3: Results of in-depth analysis	25
3.1 Children's current knowledge of and attitudes to climate change and their understanding of their role in mitigating it	25
3.2 The extent to which climate change is being taught in schools	29
3.3 Can education deliver behaviour change?	33
3.4 A role for education in changing behaviour?	38
3.5 Real life examples – have educational activities delivered behavioural change in the past? What can we learn from previous initiatives?	39
Part 4: Quantification of the carbon impact that education could have.	51
4.1 Children's current use of energy and the potential to reduce this	51
4.2 Children's influence over household energy use	53
4.3 Children's future use of energy (i.e. their use of energy as adults)	53
4.4 Energy use in the wider community	54
Part 5: Recommendations	55
Appendix 1: Brief summary of schools related programmes in EnR member countries.	59
Appendix 2: Methodological notes on the selection of behavioural areas	62

Executive Summary

There is growing acknowledgement of the need for action to engage UK consumers in delivering carbon emissions reductions, and the importance of removing the barriers which are preventing them from changing their energy-related behaviour. This has led to a huge amount of research being undertaken on the subject of pro-environmental behaviour change (of which energy-related behaviour is a component), and in recent years a number of useful syntheses of the research evidence have been completed¹. As a result a great deal is now understood about how public policy can (and cannot) change consumer behaviour. In parallel with these developments there has been increasing interest in the role that [the] education [of children] can play in delivering pro-environmental behaviour change. However, this increasing level of interest has not been accompanied with an increasing level of research.

The Energy Saving Trust conducted an in-depth review to analyse the extent to which education and schools more generally can deliver behaviour change in a) the long and short term, b) the households of children who are taught about energy, and c) the wider community. The report begins by defining energy-related behaviours and considers the barriers to delivering behaviour change in this area. It goes on to discuss the policy context within which energy-related behaviour change and energy-related education sit. It then reviews the current state of knowledge relating to children's understanding of, and attitudes to climate change, and then considers the extent to which these issues are currently being taught in schools. It goes on to explore in detail the evidence base relating to the role

that education and schools could play in delivering behaviour change.

The report's key findings are:

Children's understanding of climate change

- While most young people appear to be aware of the terms climate change and global warming, approximately 50 per cent claim not to be concerned about climate change and only a relatively small number feel they have quite a lot of knowledge about its causes.
- While the majority of young people appear to be aware of at least some ways to save energy at home, they do not believe that they have a large role to play in tackling climate change. Indeed when considering all the people that could have an influence on climate change young people were least likely to believe that they themselves could help a lot. Although, interestingly those who had studied climate change at school were slightly more likely to believe that people their age could help a lot.
- It is difficult to draw conclusions about the extent to which young people are taking action themselves (with one survey suggesting 80 per cent of students claim to be undertaking at least one climate friendly behaviour, and another putting this figures at 16 per cent), and how this might link to what they are taught at school. However, those that claimed to have learnt about climate change at school were more likely than those that hadn't studied it to claim that they were taking action.

¹ For Example: Motivating Sustainable Consumption, Tim Jackson 2005 (for the Sustainable Development Research Network), and 'Promoting Pro-Environmental Behaviour: Existing Evidence to Inform Better Policy Making', Andrew Darnton 2006 (for CfSD at the University of Westminster and Defra CAD)



Climate change teaching in schools

- There is limited detailed evidence available about the extent to which schools teach climate change, how they teach it, how frequently they teach it, and the extent to which consideration is given to the role of individuals in tackling it. What evidence is available suggests that climate change may not be taught frequently, and that very little energy-related activity is undertaken in schools for 14 to 19 year olds.
- Young people do not always find sources of information on climate change clear (with 44 per cent finding information confusing), and believe that climate change teaching in school needs to be more interactive, discussion based and involving.
- There is no shortage of sustainable energy initiatives that schools can take advantage of. However, these are not always linked in a coherent way or made easily accessible to schools.

Delivering behaviour change in the long and short term

- There is a lack of evidence on the impact that education and awareness-raising activities with young people have on their long term behaviour (i.e. their behaviour as adults). Indeed long term impact evaluations particularly those with a behavioural element are rarely undertaken.
- There is limited evidence of the impact that education has on short-term behaviour. The available evidence of impacts is in the area of safety education and suggests that, in the short term at least educational activities can bring about changes in young people's behaviour.
- Behavioural theory suggests that education can put in place the necessary foundations

for delivering behaviour change, although it alone is unlikely to be sufficient to bring about pro-environmental behaviours.

- Education can play a number of roles in encouraging pro-environmental behaviour. These range from the provision of information, to working on the more attitudinal factors which can underpin a variety of pro-environmental behaviours, to providing a context within which individuals can debate with each other, learn from experience, and experience change of attitudes, motivations, and behaviours.

Delivering household behaviour change

- Evidence also suggests that educational initiatives can have an impact on parental behaviour, with children taking home aspects of what they have learnt. The available evidence of impacts is in the areas of energy and litter behaviour.

Delivering household behaviour change in the wider community

- There is little theoretical evidence or evidence from specific initiatives relating to the extent to which education or schools more generally can lead to community wide behaviour change and the behaviour of the wider public.

The report concludes by setting out the actions that we believe will be required in order to ensure that schools and education's contribution to climate change mitigation is optimised.

Introduction

Climate change is widely recognised as a serious global threat², and the evidence that human activities are responsible is now indisputable³.

In the UK individuals are directly responsible for approximately half of all carbon emissions. This means that if the UK is to meet its challenging climate change targets - to reduce carbon dioxide (CO₂) emissions by 20 per cent below 1990 levels by 2010, and a longer term goal to put the UK on a path to reduce CO₂ emissions by 60 per cent by 2050⁴, with real progress by 2020⁵ - millions of UK consumers will need to change their energy-related behaviour (both in purchasing and use of energy consuming equipment). Despite this the Energy Saving Trust's research shows that whilst more than 75 per cent of people now understand and agree that climate change is a major issue, 38 per cent admit to doing nothing to reduce their own emissions, and only 4 per cent claim to have made substantial lifestyle changes⁶.

There is growing acknowledgement of the need for action to engage UK consumers in delivering carbon emissions reductions, and the importance of removing the barriers which are preventing them from changing their energy-related behaviour. The 2006 Energy Review for example notes that **'If we are to be successful in delivering the long-term cuts in carbon emissions that we need to avert dangerous climate change, the**

involvement of individuals will be critical.', and **'The start point for reducing carbon emissions is to save energy...the main obstacles to the take up of energy efficiency are lack of information about costs and benefits, absence of appropriate incentives, and lack of motivation among consumers.'** The 2006 Stern Review highlights that **'the removal of barriers to behavioural change is...particularly important in encouraging the take-up of opportunities for energy efficiency'**, and the 2007 Energy White Paper notes that **'By removing barriers to the take up of cost-effective energy efficiency measures, all of us, businesses, individuals and the public sector can take steps to reduce emissions and our energy dependence.'**

A huge amount of research has been undertaken on the subject of pro-environmental behaviour change (of which energy-related behaviour is a component), and in recent years a number of useful syntheses of the research evidence have been completed⁷. As a result a great deal is now understood about how public policy can (and cannot) change consumer behaviour.

In parallel with these developments there has been increasing interest in the role that [the] education [of children] can play in delivering pro-environmental behaviour change. There has been interest in this issue for a number of decades. One of the three goals for



² See for example Stern 2006 (www.hm-treasury.gov.uk/independent_review/stern_review_economics_climate-change/sternreview-index.cfm)

³ <http://www.ipcc.ch/SPM2feb07.pdf>

⁴ Note: the climate change bill 2007 aims to make the UK's targets for a 60 per cent reduction by 2050 and a 26 to 32 per cent reduction by 2020 legally binding.

⁵ Energy White Paper: Our energy future – creating a low carbon economy, DTI, 2003

⁶ Energy Saving Trust, National Attitude and Behaviour Tracker, 2007-2008, Wave 5 report, 31st July 2007

⁷ For Example: Motivating Sustainable Consumption, Tim Jackson 2005 (for the Sustainable Development Research Network), and 'Promoting Pro-Environmental Behaviour: Existing Evidence to Inform Better Policy Making', Andrew Darnton 2006 (for CfSD at the University of Westminster and Defra CAD), and more recently 'Positive Energy: Harnessing people power to prevent climate change', Simon Retallack and Tim Lawrence with Matthew Lockwood, 2007 (IPPR)

⁸ The world's first intergovernmental conference on environmental education

environmental education agreed at the Tbilisi Intergovernmental Conference on Environmental Education⁸ in 1977 was, for example, to **'create new patterns of behaviour of individuals, groups, and society as a whole toward the environment'**⁹. And the last 12 months or so have seen considerable political interest in this issue (see for example box 1). Indeed the recent DfES consultation on Sustainable Schools suggested that education is **'one of the key ways by which the Government expects to realise'** the Sustainable Development Strategy's cross cutting goal of changing behaviour.

The role of education in tackling climate change even made it into popular culture earlier this year, with the music video for Eric Prydz Vs Pink Floyd's "Proper Education" featuring teenagers breaking into houses to change incandescent light bulbs for CFLs, turn down thermostats and switch off TVs. Interestingly the video ends with the words **'We don't need no education to save the planet'**. The single hit the charts in January 2007.

However, this increasing level of interest has not been accompanied with an increasing level of research. While the research evidence relating to changing the behaviour of existing adult consumers continues to grow, there has been little research relating to the role that educating children could play in delivering behaviour change in both the short and long term. In a 1995 review Hoody¹⁰ identified a fundamental lack of impact evaluations of

environmental education schemes, especially any exploring 'follow-up or long term effects'. In addition there has been little attempt to join up the two bodies of literature (behavioural theory and educational theory), and education per se does not tend to feature in the theoretical literature on pro-environmental behaviour change (Darnton, 2006).

Against this background the Energy Saving Trust has conducted a much needed in-depth review that analyses the extent to which education and schools more generally are able to influence the energy-related behaviour of current and future consumers.

The analysis begins by reviewing the current state of knowledge relating to children's understanding of and attitudes to climate change, and then considers the extent to which these issues are currently being taught in schools. It goes on to explore the available evidence on the extent to which they can¹¹:

- **Deliver long term behaviour change.**

Does educating children about energy mean that they will be better energy consumers as adults?

- **Deliver short term behaviour change.**

Does educating children about energy mean that children will modify their own energy related behaviour?

- **Deliver household behaviour change.**

Does teaching children about energy result in them influencing the energy use of their parents and other household members?

⁹ The other goals were 'to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas' and 'to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment'.

¹⁰ Hoody, L. 1995. The Educational Efficacy of Environmental Education, Linda Hoody at the State Education and Environment Round Table (San Diego, California), November 1995.

¹¹ Note: It is worthwhile noting that there are undoubtedly other impacts that energy-related education could have – for example potentially helping to fill skills shortages within the energy industry by building interest in energy related jobs amongst secondary school children, ensuring that future business leaders manage their businesses in more sustainable ways etc.

- **Deliver community wide behaviour change.** Can schools influence the energy saving behaviours of individuals within the communities in which they are situated?

It is important to highlight that it is not appropriate to place the responsibility for tackling climate change onto children. However, children are users of energy now and will be in the future and as it would seem irresponsible not to inform them about what they can do to reduce their own impact on climate change.

This report sets out the results of that work in 5 parts:

- **Part 1** outlines the Energy Saving Trust's approach to this study.

- **Part 2** provides the context for the analysis.

- **Part 3** presents the results of the in-depth analysis.

- **Part 4** quantifies the potential carbon impact that education could have.

- **Part 5** summarises the Energy Saving Trust's recommendations.

For the purposes of this report 'children' refers to school age children (i.e. between the ages of 5 and 18), and 'education' refers to formal education delivered in schools.

Box 1: A snap-shot of the recent interest there has been in the role that education and schools can play in influencing energy-related behaviour

1. Delivering long-term behaviour change

'Schools are often the hub of a community. But more importantly they are where the behaviour of future generations is shaped. Solar panels, wind turbines, wood-fuelled boilers. These technologies and more can bring the message home to our children.' – From speech by Malcolm Wicks MP, June 2006 (see: <http://www.dti.gov.uk/about/dti-ministerial-team/page31126.html>)

'The Executive recognises that initiatives that educate and encourage young people to save energy are key for the creation of sound long-term energy aware behaviour – for the young people themselves and also for the influence that they can exert on the behaviour of their families' – Energy Efficiency & Microgeneration – Achieving a low carbon future, a strategy for Scotland, draft for consultation, March 2007

2. Delivering short term behaviour change

'Schools have an especially important role. Educating people from an early age about how our actions influence the environment is a vital element in promoting responsible behaviour. Creative and practical ways can be found to help pupils translate the study of climate change into actions in their everyday lives. For instance, practical examples of sustainability, such as installing wind turbines in school grounds, can help to provide pupils both with an understanding of the consequences of their actions and a tangible example of how behaviour, incentives and technologies can provide solutions'. – Stern Review, 2006

'Education for Sustainable Development aims to give young people the tools to make their own informed decisions and act, individually and collectively, to achieve the positive behavioural change required to live more sustainably'. – First steps towards sustainability, a sustainability strategy for Northern Ireland, May 2006

3. Taking the message home

'They can act as vivid teaching aids in science lessons, civics lessons, geography lessons. And, as is often the way, those children will then begin to educate the parents. In this way we can start to shift behaviour'. – From speech by Malcolm Wicks MP, June 2006 (see: <http://www.dti.gov.uk/about/dti-ministerial-team/page31126.html>)

Children are the key to changing society's long term attitudes to the environment. Not only are they passionate about saving the planet but children also have a big influence over their own families lifestyles and behaviour.' – David Milliband, February 2007 (see: <http://www.defra.gov.uk/news/2007/070202b.htm>)

4. Influencing energy-related behaviours across the community

'With schools often being the focal point of communities, the installation of renewables could help to shape attitudes in the wider community.'

Installing new technologies on schools could **'...help to educate and inform communities about energy and hopefully, persuade people to reduce their own footprint'**. – DTI, Microgeneration Strategy: Power from the People, 2006

'Schools are well placed to exert a broader influence in their communities...'

'By 2020 we would like all schools to be models of energy efficiency and renewable energy, showcasing wind, solar and bio-fuel sources in their communities...' – DfES, Sustainable Schools: for pupils, communities and the environment, 2006

'School buildings serve as focal points for communities and especially households with school-age children. The adoption of appropriate microgeneration systems in schools is, therefore, a clear demonstration and constant reminder of the potential benefits of the technology'. – Welsh Assembly Government, Microgeneration Action Plan for Wales, March 2007

Part 1

Approach

The Energy Saving Trust commissioned and contributed to a number of pieces of research over the course of 2006/7 to explore the impacts that education and schools more generally can have on current and future energy-related consumer behaviour. This research was primarily undertaken by Andrew Darnton Research and Analysis Limited¹², and Allegra Strategies Limited¹³.

In parallel with this commissioned work, the Energy Saving Trust conducted a survey of members of the European Energy Network (EnR)¹⁴ to find out more about the evaluation of behavioural impacts as part of education related energy projects across Europe. A brief summary of programmes can be found in Appendix 1¹⁵. In addition, the Energy Saving Trust provided guidance to quantitative and qualitative research commissioned by BP and undertaken by EdComs and Continental research. This research aimed to explore 14 to 16 year olds' understanding of and attitudes to climate change and involved interviews with pupils, parents and teachers¹⁶.

The work undertaken by Andrew Darnton Research and Analysis Limited consisted of two

literature reviews, and that undertaken by Allegra was qualitative consumer research which included focus groups undertaken with children and teenagers (aged 10 to 18).

This report combines this research, together with that undertaken by others.

As noted above, this research was undertaken in the knowledge that there is very little available research relating to the role that educating children could play in delivering energy-related behaviour change in both the short and long term. For this reason the research drew on the theoretical literature, in particular that relating to theories of pro-environmental behaviour change (and where available theories of energy-related behaviours).

For the same reason the research also drew on other behavioural subject areas in addition to energy. The reasoning here was that if there is evidence that education can change behaviour in other areas, then in theory at least it might be able to have an impact on energy-related behaviours¹⁷.

¹² Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Shaping the energy-related behaviour of future consumers, desk research, December 2006, and Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Energy, schools and Communities, March 2007.

¹³ Allegra Strategies, Project Renew, UK Consumer Perspectives on Renewable Energy, October 2006. This research was supported by the Energy Saving Trust (and others).

¹⁴ EnR is a voluntary network of leading European 'national' energy agencies. Founded in 1992 it now consists of 21 members. It acts as an informal network to promote sustainable energy good practice and undertakes a portfolio of European projects, funded by the European Commission. For the 2007/8 financial year the Energy Saving Trust is holding the Presidency of the EnR Troika (management committee).

¹⁵ Note: The response rate, overall quality of responses and lack of evaluation data in terms of behaviour change meant that it was not possible to draw any robust conclusions from work across Europe. However, the data collected is still valuable from a case study perspective.

¹⁶ EdComs and Continental Research for BP, 14 to 16 year olds and climate change, June 2007

¹⁷ It is important to note that these subject areas were chosen in the context of identifying long term behaviour change. The first piece of work that the Energy Saving Trust commissioned from Andrew Darnton Research and Analysis Limited had the initial objective to 'Establish and review the current state of knowledge about the impact of education/awareness raising programmes on children's long-term behaviour (i.e. their behaviour as adults)', and as such the behavioural areas were chosen in this context. However, the lack of evidence of long term behavioural change identified in the early stages of the research meant that the objective of the work was subsequently refocused to ask 'What role does education play in determining pro-environmental (and specifically energy-related) behaviours in the short and longer term?'. There was insufficient resource and time to commission additional work to explore additional behavioural 'areas' where there may be evidence of short term impacts. This includes for example evidence relating to school travel plans.

1.1 The selection of behavioural subject 'areas'

A number of general criteria were applied to determine whether a subject area should be selected for analysis or not. These included:

- The likely availability of evidence (i. that evaluations exist, and ii. they are in the public domain).
- The existence of sufficient education and awareness-raising activities involving young people.
- The inclusion of behavioural goals (at least in part, and ideally long-term goals).
- The potential transferability of any lessons and principles to energy-related initiatives.

This resulted in the selection of six key areas for the research to focus on:

1. Energy-Related Behaviour
2. Environmental Citizenship (and Citizenship Curriculum)
3. Health
4. Fairtrade
5. Littering
6. Safety

Further details on the reasoning behind including these areas and rejecting others can be found in Appendix 2. It is worthwhile noting here that, despite the fact that there is plentiful evidence in this area, a conscious decision was made not to include the 'area' of 'drug use, smoking and drinking' within the analysis. These behaviours tend to be initially shaped by peer dynamics. However, they subsequently rely on habits based on 'pleasure'.



1.2 Education and behaviour change

This report does not consider whether it is 'right' or 'wrong' for education to deliver behaviour change. There is much debate and theoretical work in the education and environmental education literature about the purpose of education and the extent to which education activities should prescribe behavioural outcomes (for further discussion see Darnton 2006¹⁸). However, across GB both education policy and sustainable development policy explicitly highlight the expectation that education (related to sustainable development) should seek to change behaviour. DfES' sustainable schools agenda (2006)¹⁹ notes that education is **'one of the key ways by which the Government expects to realise'** the Sustainable Development Strategy's cross cutting goal of changing behaviour, relevant policy documents for Scotland and Wales note that **'sustainable development education is an approach that not only delivers knowledge and understanding but also enables learners to act on this information to change their behaviour'**²⁰, and **'high quality education must ensure that these aspects are brought to life, understood, acted upon and evidenced through actions by individuals, whilst at the school, and through their lives in the wider community'**²¹ respectively, and the 2005 UK Sustainable Development Strategy²² notes that **'Formal education has a crucial role to play in both raising awareness among young people of sustainable development, giving**

them the skills they need to put sustainable development into practice in later life; but also in forming good habits at an early age.'

Policy also suggests a role for schools in delivering community wide behaviour change. For example the 2006 Sustainable schools consultation highlighted a Government aspiration that by 2020 all schools should be **'...models of energy efficiency and renewable energy, showcasing wind, solar and biofuel sources in their communities....'**

This report is therefore written in the context that there appears to be broad Government agreement that in relation to sustainable development education schools should, at least to some extent, be expected to deliver behaviour change of pupils and in the wider community.

Finally, it is important to note that the focus of this report is on the extent to which energy-related education can, within the current theoretical and policy frameworks contribute to delivering climate change goals, not the extent to which energy-related education can contribute to delivering educational goals. However, it is worthwhile noting that a number of pieces of research and anecdotal evidence do point to a positive link. This includes research undertaken in the USA which suggests that using the environment as an 'integrating context' for learning improves literacy and numeracy standards, develops critical thinking skills and reduces behaviour problems²³.



¹⁸ Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Energy, Schools and Communities, March 2007.

¹⁹ Sustainable Schools for pupils, communities and the environment (consultation), DfES 2006

²⁰ Learning for the future: Scotland's first action plan for the UN decade of education for sustainable development, Scottish Executive, 2006

²¹ Education for Sustainable development and global citizenship – A Strategy for action, Welsh Assembly Government, 2006

²² Securing the Future - UK Government sustainable development strategy, HM Government, 2005

²³ Environment-based Education: Creating High Performance Schools and Students', the National Environmental Education and Training Foundation, Washington DC, 2000 (quoted in: Sustainable Schools for pupils, communities and the environment (consultation), DfES 2006

Part 2

Context

This section of the report considers the context within which the above research was undertaken and within which this report is written. It is divided into 4 sections which consider the following subjects:

- **What are energy-related behaviours?**
- **The barriers to sustainable energy.**
- **Delivering energy-related behaviour change** – the current policy context.
- **Schools and the delivery of energy related behaviour change** – the current policy context.

2.1 What are energy-related behaviours?

In the context of sustainable energy 'behaviour change', can be broken down into two broad categories:

- changes to purchasing behaviour, and
- changes to routine behaviour.

The most common use of the term 'behaviour change' refers to changes in routine behaviour – in other words someone actually changing what they do on a day to day basis. However, in the case of sustainable energy, purchasing behaviour is also important. The broad categories can be further broken down as discussed below, and summarised in table 1.

Table 1: Types of behaviour change

Scale of behavioural change →			
↓ Frequency	Modification/minor change		Complete/major change
	Rare (purchases)	Purchase the low carbon option	Make a new sort of purchase
		Compact florescent lights A-rated appliances Efficient boiler Efficient cars (in same class)	Loft or cavity wall insulation Green electricity tariff Smaller, lower power or alternatively powered car Micro-generation Move house to reduce commute
	Common (use)	Minor change to a common routine	Behave in completely new way
		Switch off the lights Don't overfill the kettle 'Eco drive', eg don't accelerate hard Switch off not standby	Use public transport Cycle or walk Take holidays close to home Video or tele-conference Buy at the local shop



Changes to purchasing behaviour:

• Purchase the low carbon option

Such purchases are generally prompted by the need for replacement, for example when a washing machine breaks down, or a light bulb needs to be replaced. By their nature they are relatively rare purchases, and require only a modification in behaviour (i.e. a change in purchase decision in favour of the most energy efficient replacement).

It is unlikely that children are responsible for the majority of such purchases in the home. However, market research shows that children's ownership of electricity using products, for example TVs and PCs is considerable and growing, with 82 per cent and 41 per cent of children now claiming to have a TV and/or a PC respectively in their room²⁴. This compares with 58 per cent and 14 per cent respectively in 1997. Nevertheless, the extent to which children, as opposed to their parents (who are likely to control the purse strings), have control or have some influence over model choice is not clear.

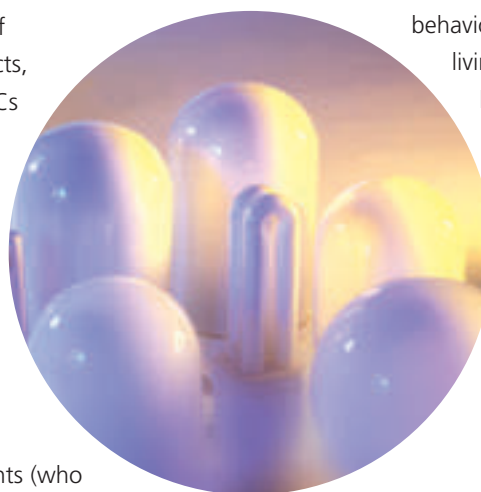
In terms of new car purchases, market research indicates that whilst new car purchases are usually discussed within the family, the final decision is usually made by the parents²⁵.

"My dad would ask me what I thought, but it's his final decision because he pays the bills"

"My parents just bought a new car and they asked me if I liked it and I was like no, but they got it anyway"

The theoretical impact of education here would include helping children to choose the most efficient models, encouraging children to influence the purchasing

behaviour of the adults living in their households, and helping children purchase better as adults.



²⁴ ChildWise Monitor, The trends report, ChildWise, 2006

²⁵ Allegra Strategies, Project Renew, UK Consumer Perspectives on Renewable Energy, October 2006.

- **Make a new sort of purchase**

Such purchases are not prompted by the need for replacement, for example buying loft or cavity wall insulation (CWI), or installing micro-generation. They are essentially new behaviours, and require consumers to do something they weren't necessarily going to do in the first place.

It is very unlikely that children have any responsibility for such purchases. In terms of switching to a green electricity tariff and the installation of microgeneration, market research evidence indicates that children have no influence in parents' choice of electricity supplier, and that the installation of microgeneration tends not to be discussed within their families²⁶.

"My parents decide what type of energy we use in our home..."

"My parents pay the bills so it is their decision who they want to supply our energy."

"Kids can't tell their parents what to do. We don't have a say because they are paying for it"

The theoretical impact of education here is therefore limited to influencing children's future purchasing behaviour and helping them to influence where possible the purchasing behaviour of other members of their households.

Changes to routine behaviour:

- **Minor change to a common routine**

Some changes to existing routines are relatively simple and easy to implement, for example switching off the lights and turning appliances off standby.

As noted above, evidence suggests that children's ownership of energy using products is considerable and growing. As such children are directly responsible for some electricity using products and the extent to which they are (or not) left on standby or indeed left on when they are not being used. Market research indicates many children believe that they and their siblings are the family members using and wasting the most energy²⁷.

"My little brother uses and wastes the most energy. He has a computer, Playstation and a TV and he leaves them all on all the time"

"My sister and I both use a lot of energy because we have straighteners and curlers for our hair and we always forget to turn the computer off"

"I probably waste the most energy at home because I am always leaving the TV on"

Thus, theoretically education could help children change their current and future common routines in order to save energy, and also encourage children to promote similar behaviours amongst other household members.

²⁶ Allegra Strategies, Project Renew, UK Consumer Perspectives on Renewable Energy, October 2006.

²⁷ Allegra Strategies, Project Renew, UK Consumer Perspectives on Renewable Energy, October 2006.

- **Behave in a completely new way**

Other changes to existing routines require a complete change in behaviour, for example using public transport instead of driving, and taking holidays closer to home, etc.

Children are very unlikely to be responsible for such behaviours. Available research²⁸ suggests that parents play a key role in making decisions about how, where, and when their children travel, and that this is particularly the case for children under the age of 16, with parents reporting that they restrict their children's use of cycling, walking and taking the bus at night due to concerns about heavy traffic and personal safety.

However, the same research also notes that parents felt that weather influenced their children's modal choice – with children happier to walk in good weather, but more likely to want a lift in winter. This suggests that children have at least some influence in this area.

In terms of family journeys qualitative market research²⁹ indicates that children rarely discuss the type of transport they would use for particular journeys with their families.

“We don't even think about it really; it's always the car”

Thus the impact that education could have on these is also limited to children's future behaviour as adults and their ability to influence the behaviour of others in their households.

The potential influences of education on purchasing and routine behaviour are summarised in table 2.

Table 2: The potential influences of education on purchasing and routine behaviour

Scale of behavioural change →			
↓ Frequency		Modification/minor change	Complete/major change
	Rare (purchases)	Purchase the low carbon option Children's current behaviour Children's future behaviour Behaviour of household members	Make a new sort of purchase Children's future behaviour Behaviour of household members
	Common (use)	Minor change to a common routine Children's current behaviour Children's future behaviour Behaviour of household members	Behave in completely new way Children's future behaviour Behaviour of household members

²⁸ Young people and transport: Their needs and requirements, DfT (no date listed): <http://www.dft.gov.uk/pgr/inclusion/childrenandyoungpeople/youngpeopleandtransporttheir1186>

²⁹ Allegra Strategies, Project Renew, UK Consumer Perspectives on Renewable Energy, October 2006

2.2 Barriers to sustainable energy

Barriers to energy efficiency

Despite considerable scope in the UK for the installation of energy efficiency measures³⁰, and the fact that more than 75 per cent of people now understand and agree that climate change is a major issue, uptake of energy efficiency measures is still limited and not yet at level that will ensure appropriate contribution to UK climate change targets.

Barriers to energy efficiency (i.e. the reasons people are not installing energy efficiency measures) tend to be looked at from two different perspectives – an economic perspective and a psychological/sociological perspective.

The economic perspective

Traditional economic theory suggests that consumers will always act in such ways as to maximise benefits to themselves. So, in theory, because energy efficiency is cost effective all consumers should want to, and indeed should, install energy efficiency measures in their homes, and modify their energy-related behaviour to minimise their energy use. In reality they don't. The economic perspective considers why consumers don't act given that it is in their financial interests to do so. To date energy and energy efficiency literature has tended to focus more on the economic than the psychological/sociological perspective. Most recently NERA³¹ has reviewed the literature concerning barriers to energy efficiency and pinpointed seven categories of barrier to

energy efficiency. These are reproduced in box 2.

The psychological/sociological perspective

As noted in box 2 the psychological/sociological barriers consider why consumer behaviour may not conform to perfect 'economic rationality'. These barriers are considered in some depth in the literature on sustainable consumption of which consumption of energy is a part. In this context it is worthwhile noting that NERA (2006)³² consider that psychological/sociological barriers

'...ultimately may be among the root causes of lower-than-expected uptake of measures'. The difficulty of tackling the psychological/sociological barriers to pro-environmental behaviour is highlighted by Darnton (2006) who notes that 'social-psychological research evidence stretching back thirty years or more reveals pro-environmental behaviours to be complex, determined by multiple factors impacting at different levels and in varying combinations. Moreover, not only are the variables informing pro-environmental behaviours in general complex, but they are shown to vary widely from behaviour to behaviour'.



³⁰ The Energy Efficiency Innovation Review (EEIR) identified almost 9MTC/year of cost effective reductions in the household sector by 2020

³¹ Evaluation of Supplier Obligation and options, Report for DTI and Defra, NERA, 2007

³² Evaluation of Supplier Obligation and options, Report for DTI and Defra, NERA, 2007

Box 2: Barriers to energy efficiency

- 1. Basic financial barriers:** These include the potentially higher (upfront) costs of energy efficient products and the interest rates available to households.
- 2. Hidden costs:** These include 'transaction costs' associated with finding reputable providers, time costs of disruption, and the costs of differences in quality of product or service – all of which may reduce the net benefit derived from efficiency measures.
- 3. Lack of information:** If households do not know their level of energy expenditure, how energy use can be reduced, by how much, or at what cost, they are unlikely to consider investment in energy efficiency.
- 4. Risks and uncertainty:** Uncertainty about future energy prices may deter households from investing, since they cannot be assured of future savings; households also may not be certain whether their tenure at a property will be sufficiently long for future savings to repay an initial outlay. In addition, households may be wary of the risk associated with new (or unfamiliar) products or services.
- 5. Poorly aligned incentives:** The most commonly cited barrier of this kind is the "landlord-tenant split", whereby landlords under-invest in energy-efficiency because tenants pay energy bills, or tenants do not economise on energy because the landlord pays the energy bill. Similar misalignments occur in the building industry and among property developers, often due in part to asymmetries of information. Failure to incorporate environmental or other externalities (such as energy security) into energy markets also is included here.
- 6. Psychological / sociological barriers.** This category refers to a range of less tangible barriers that may explain consumer behaviour that does not conform to perfect "economic rationality". These may include inertia in decision-making (which may be due to loss-aversion and concerns about regret), the use of rules-of-thumb rather than more complicated full optimisation, and preferences that depend on the behaviour of others.
- 7. Regulatory barriers:** Finally, there are aspects of the energy market and its regulatory framework that could make it more difficult for households to benefit from or consider energy efficiency. Examples include limits on the types of "contracts" offered to households by suppliers, assignment of responsibility for metering, and treatment of (high-efficiency and/or low-carbon) distributed generation.

Barriers to other sustainable energy measures

Microgeneration

Economic barriers play a key role in the uptake of microgeneration, with high capital costs, seen as the principal barrier to the uptake. Other barriers cited in the literature include those relating to the image of microgeneration and lack of familiarity with the technology .

Reducing car use

A recent report by IPPR³⁴ notes that the available research suggests that in terms of reducing car use **'it is increasingly likely that social and emotional factors are more important than cognitive evaluations of time and cost'**. However they go on to highlight that 'there is little evidence about the relative importance of these barriers.'

Barriers to buying lower-carbon cars

The available research evidence suggests that consumers are driven by finance when it comes to buying cars and broadly speaking not by environmental issues³⁵.

Clearly the education of children and schools more generally can have little impact on tackling the majority of the economic barriers to sustainable energy. However, they could theoretically have an impact on:

- psychological/sociological barriers, and
- barriers associated with lack of information.

These barriers and the impact that education could have on them are considered in more detail in the results section of this report (section 3).



³⁴ Positive Energy, Harnessing people power to prevent climate change, Simon Retallack and Tim Lawrence with Matthew Lockwood, 2007 (for IPPR)

³⁵ Positive Energy, Harnessing people power to prevent climate change, Simon Retallack and Tim Lawrence with Matthew Lockwood, 2007 (for IPPR)

2.3 Delivering energy-related behaviour change – the policy context

As discussed in the introduction the 2006 Energy Review and the 2007 Energy White paper highlight the critical role of individuals in addressing carbon emissions and the importance of removing the barriers which are preventing them from changing their energy-related behaviour. The 2007 Energy White Paper explores several means of encouraging this, and notes that for Government its role will be to encourage this **'by providing support and assistance to individuals looking to make greener lifestyle choices; by providing information on energy use and its impact on carbon emissions; and by ensuring that the regulatory framework is in place to deliver improvements to the buildings, products and services that individuals can buy.'**

The Energy Saving Trust, along with others, will play a key role in delivering this large scale citizen engagement and subsequent behaviour change. Of particular importance in this context moving forward will be the Energy Saving Trust's Sustainable Energy Network (SEN)³⁶ which aims to secure an immediate and rapid escalation of the rate at which current

carbon saving methods are adopted by consumers, and to create 'low carbon citizens' who actively choose sustainable energy options through their behaviour and purchasing decisions. Community level engagement will also be key to delivering this level of behaviour change. To this end we run a number of support programmes for local authorities and our Community Action for Energy Programme³⁷ works to develop communities' ability to facilitate action on climate change, and to date has supported a number of schools keen to play a role as a key part of their communities.

The potential role of education and schools more generally in facilitating energy-related behaviour change receives little consideration at a UK level in climate change, and energy policy. While the 2005 UK Sustainable Development Strategy notes that **'Formal education has a crucial role to play in both raising awareness among young people of sustainable development, giving them the skills they need to put sustainable development into practice in later life; but also in forming good habits at an early age'**, the 2006 UK Climate Change Programme makes no reference to the role of education although it does highlight the importance of encouraging the sustainable use of energy in schools buildings³⁸.

³⁶ The Energy Saving Trust has piloted the Sustainable Energy Network (SEN) in three areas of the UK. Each SEN aims to:

- Develop the infrastructure in their region to make it easier and simpler for people to take sustainable energy action in their homes and in their transport choices.
- Provide a one stop shop on sustainable energy (energy efficiency, renewables and transport) information and advice service.
- Provide leadership and a focal point for regional sustainable energy initiatives.

The results of the pilots have been very positive. The carbon savings are significantly higher than expected and cross-referrals have been well above target.

³⁷ Community Action for Energy (CAfE) is a programme managed by the Energy Saving Trust that is designed to promote and facilitate local community-based energy projects

³⁸ It is interesting to note that the 2000 UK Climate Change Programme noted that 'The need to educate and inform children and young people about climate change is an issue that the Government is addressing, and went on to cite the importance of citizenship education in this context, and referenced a number of Government resources developed to promote understanding of climate change amongst school children. And the Climate Change Programme Review consultation document acknowledged that 'the education sector is important for the opportunities the curriculum offers to inform young people about climate change and the steps they can take to combat it'.

Despite the lack of specific reference to education and children within the UK Government's climate change and energy policy, Defra do see children as part of the general public and undertake some activities aimed at children. These activities form part of Defra's wider public engagement work³⁹. In addition the DTI's 2006 Microgeneration Strategy 'Our Energy Challenge – Power to the People' makes a number of positive noises about the importance of educating children (see for example box 1), but the only actions relevant to schools relate to the installation of microgeneration technologies in schools as opposed to teaching children about microgeneration technologies. Nevertheless the DTI has developed a programme (Its Only Natural⁴⁰) for primary and secondary schools to provide information and teaching resources about eight key renewable energy sources, which has been distributed to schools across the UK.

Greater consideration of the role of educating children is provided in energy efficiency and microgeneration policy in Scotland and Wales. The recent consultation on an Energy Efficiency and Microgeneration Strategy for Scotland notes that **'the Executive recognises that initiatives that educate and encourage young people to save energy are key for the creation of sound long-term energy behaviour – for the young people themselves and also for the influence that they can exert on the behaviour of their families'**, and proposes to **'develop more focussed education and awareness programmes aligned to the Eco Schools initiative during 2007'**. And the recently published Microgeneration Action Plan for Wales suggests that **'the national curriculum should cover climate change and actions that individuals can take to reduce the emission of greenhouse gasses'** and commits to bilingual courses being available to schools in Wales by 2008.

³⁹ This includes the Climate Change Communications Initiative (CCCI). The CCCI provides financial support for communications projects seeking to achieve positive changes in public attitudes about climate change. A number of projects funded under this initiative involve schools. Another relevant strand of the CCCI is the Climate Change Champions initiative which is for young people aged 10 to 18 years old and designed to find nine Champions to help Defra spread the word about climate change. In addition Defra (together with DfES and separately the Scottish Executive) has recently made the decision to send the film 'An Inconvenient Truth', together with other support materials to all secondary schools in England (and Scotland).

⁴⁰ <http://www.dti.gov.uk/energy/sources/renewables/renewables-schools/index.html>

2.4 Schools and the delivery of energy-related behaviour change – the policy context

The recent (2006) DfES consultation on Sustainable Schools suggested that education is **‘one of the key ways by which the Government expects to realise’** the Sustainable Development Strategy’s cross cutting goal of changing behaviour. This consultation and subsequent Action Plan (2007) set out DfES’s intention for every school to be a ‘sustainable school’⁴¹, and outline what DfES will do to help schools and local authorities to deliver this challenge. The Action Plan sets out an expectation that the education system should be reoriented **‘gradually and consistently over the period from here to 2020 to achieve the necessary system change’**, and outlines a framework of eight sustainability themes. Of relevance in this context are the ‘energy and water’ and ‘travel and traffic’ doorways. It is notable that energy does not have its own doorway, and that there is no formal link between the ‘travel and traffic’ doorway and the ‘energy and water doorway’. However, it is clear that climate change considerations could be arrived at via a number of doorways.

DfES sees the sustainable schools agenda as being delivered through the three C’s: Curriculum, Campus and Community:

The curriculum

Sustainable energy is essentially the energy part of sustainable development, and while sustainable development is not currently a stand alone subject within the English

curriculum, it is a teaching requirement in some subjects. DfES also highlight that there are in fact opportunities in all subjects to address sustainable development issues.

The secondary school curriculum for England has just been reviewed and revised, with the intention of making the curriculum less prescriptive and provide greater flexibility for curriculum delivery. It has often been argued that the teaching of sustainable energy has had to compete with other subjects in an already overcrowded curriculum. It is currently unclear whether the current changes will result in more sustainable energy being taught in schools. With energy representing only half a sustainability ‘doorway’ and with seven other ‘doorways’ it seems that sustainable energy might still struggle for sufficient teaching time.

In the new curriculum climate change, the environment, sustainable development and energy all feature. Specifically:

- Key Stage 3 of the new geography curriculum lists **‘Environmental interaction and sustainable development’** as one of the key concepts underpinning the study of geography. This is noted to include **‘exploring sustainable development and its impact on environmental interaction and climate change’**.
- Key Stage 3 of the new science curriculum notes that the curriculum should provide pupils with the opportunity to **‘recognise the importance of sustainability in scientific and technological developments’**, and the explanatory notes on sustainability note that **‘it could include examining issues surrounding...energy**

⁴¹ The document notes that a sustainable schools is one that is guided by the principle of care: a) care for oneself, b) care for each other (across cultures, distances, and time), and c) care for the environment (far and near).

conservation and renewable energy resources...'. It also notes that the study of science should include coverage of **'Energy, electricity and forces'** and **'The environment, Earth and Universe'**.

- Key Stage 4 of the new science curriculum notes that **'During the key stage, pupils should be taught the knowledge, skills and understanding of how science works through the study of organisms and health, chemical and material behaviour, energy, electricity and radiations, and the environment, Earth and universe.'** And on the teaching of **'energy electricity, and radiations'** and **'environment, Earth and universe'** it notes that **'energy transfers can be measured and their efficiency calculated, which is important in considering the economic costs and environmental effects of energy use',** and **'the effects of human activity on the environment can be assessed using living and non-living indicators'** respectively.
- Key Stage 3 of the new citizenship curriculum notes that the study of citizenship should include **'actions that individuals, groups and organisations can take to influence decisions affecting communities and the environment'** It goes on to explain that coverage of **'environment'** **'provides opportunities to evaluate individual and collective actions that contribute to sustainable practices. Pupils could consider the different ethical implications of actions, policies and behaviour. This work can be linked with work in science and**

geography', and that the citizenship curriculum 'should provide pupils with the opportunity to: take into account legal, moral, economic, environmental, historical and social dimensions of different political problems and issues'.

- Key Stage 4 of the new citizenship curriculum notes that the study of citizenship should include **'policies and practices for sustainable development and their impact on the environment',** and that it should provide opportunities for pupils to **'take into account legal, moral, economic, environmental, historical and social dimensions of different political problems and issues'.**
- Key stage 3 of the design and technology curriculum also touches on the environment. Under the key concept of **'designing and making'** the curriculum notes the importance of **'Understanding that designing and making has aesthetic, environmental, technical, economic, ethical and social dimensions and impacts on the world'.**

While the new science curriculum includes coverage of **'energy conservation'** there has been some concern that **'there is a risk that a scientific processes based approach of the issue will lead to neglect of the important behaviour related lessons'**⁴².

⁴² Energy Efficiency Partnership for Homes (2007) Towards Effective Sustainable Energy Education for a Low Carbon Future.



Campus

In terms of energy the main focus of the 'energy and water doorway' within the Sustainable Schools agenda and the Action Plan is on the sustainable use of energy on the school campus. The Sustainable Schools consultation for example notes that schools should monitor and reduce their energy use through **'good management and the deployment of appropriate technologies'**. However, the Sustainable Schools agenda also highlights the importance of involving energy efficiency good practice in terms of pupil and staff behaviours and routines.

Community

Community is the least prominent of the '3 Cs' in terms of delivering Sustainable Schools. Within the 'energy and water doorway'⁴³ the DfES consultation calls on schools to **'use their communications, services, contracts and partnerships to promote awareness of sustainable energy...among their stakeholders'**.

In Scotland there are also plans to better integrate sustainable development into the curriculum. Indeed the Scottish Executive sees the current review of the curriculum as **'a major opportunity to strengthen the contribution that education for sustainable development can make in Scotland's schools'**⁴⁴. In addition the Scottish Executive

has highlighted that it **'wants to build on the work of the Eco Schools Programme and do more to raise the profile of energy efficiency and microgeneration' and that it will 'develop more focussed education and awareness programmes aligned to the Eco Schools initiative during 2007'**⁴⁵. The Scottish Executive also sees the campus as key noting that **'the management of the school estate should reflect the values and principles of sustainable development'** and highlights the importance of sustainable school buildings. While relevant policy documents discuss the role of communities this is very much in relation to higher and further education establishments and community learning as opposed to considering the impact that schools and educating children could have on the wider community.

Finally, it is worthwhile noting that there appears to be no agreement in terms of which Government department (Defra or DCSF) is responsible for funding Education for Sustainable Development⁴⁶.

Evaluation

Schools in England are required to evaluate their school improvement progress using a self-evaluation form (SEF) developed by Ofsted. This includes consideration of sustainability. In addition, a school self-evaluation (s3) form has been developed which provides schools with a voluntary way to record and report their efforts to promote sustainable schools.

⁴³ Energy is one of eight doorways which are essentially different aspects of sustainable development

⁴⁴ Learning for the future: Scotland's first action plan for the UN decade of education for sustainable development, Scottish Executive, 2005

⁴⁵ Energy Efficiency and Microgeneration: Achieving a Low Carbon Future: A Strategy for Scotland, Scottish Executive, 2007

⁴⁶ Review for Funding for Education for Sustainable Development, the in-house policy consultancy serving ODPM, DfT, Defra, December 2005

Part 3

Results of in-depth analysis

This part of the report considers the results of the work in three main sections:

- What is known about children's understanding of and attitudes to climate change?
- To what extent are these issues being taught in schools?
- Can education deliver behaviour change?

3.1 Children's current knowledge of and attitudes to climate change

Defra's Attitudes to Climate Change Youth Tracker, Allegra's market research and quantitative and qualitative work undertaken by Ed Coms and Continental Research for BP all provide a useful insight in to young peoples' understanding of climate change and their role in mitigating it, from both a quantitative and qualitative point of view. We were unable to find equivalent research for younger age-groups (i.e. for children under 10).

Awareness of and knowledge about climate change

The Allegra research suggests that children and teenagers (aged between 10 and 18 years old) are conscious of issues related to energy use, such as climate change, global warming and greenhouse gases. Data from the Defra tracker

also suggests high general awareness of global warming and climate change amongst 11 to 17 year olds, with 90 per cent recognising each phrase. Awareness was found to be higher amongst older respondents (92 per cent and 94 per cent respectively of 15 to 17 year olds), although less than adult levels of awareness 97 per cent and 95 per cent respectively⁴⁷.

In terms of young peoples' perception of their own knowledge about climate change the research undertaken by EdComs and Continental Research indicated that only 21 per cent of pupils felt they had 'quite a lot' of knowledge about the causes of climate change, with 43 per cent claiming to have a little, and 36 per cent claiming to have not much or no knowledge. Slightly more pupils (23 per cent) felt they had quite a lot of knowledge about the effects of climate change, and slightly fewer (18 per cent) felt they had quite a lot of knowledge about the solutions to climate change. Interestingly the teachers felt that students were more knowledgeable about these areas (causes – 63 per cent, effects – 55 per cent, solutions – 40 per cent). The research report suggests that this discrepancy could be partly because **'students lack the confidence to say they are knowledgeable about worldly topics'**. In schools where climate change was covered students claimed level of knowledge on these climate change areas did increase.

⁴⁷ Note: The Defra work highlights that comparisons between the adult sample and youth sample should be treated with caution due to the difference in methodology and the amount of time that passed between the two surveys.

However, interestingly the qualitative research undertaken by EdComs and Continental Research revealed that the more students know about climate change the more they feel they ought to know and do.

The available research also indicates some confusion around the science of climate change:

“I’ve heard people talk about climate change. The climate is getting warmer because gases are making holes in the ozone layer”

“Greenhouse gases pollute the atmosphere and make holes in the ozone layer”

Attitudes towards climate change

Despite claimed familiarity with the concept of climate change, the research undertaken by EdComs and Continental Research suggests that climate change is not a big concern for most pupils. The EdComs research indicated that 54 per cent of pupils claimed to be concerned about climate change (9 per cent very concerned and 45 per cent quite concerned) while 43 per cent claimed not to be concerned (31 per cent not very concerned, and 12 per cent not at all concerned). And while there was some regional variation in terms of levels of concern, students on the whole reported that they were more concerned about issues such as exams, crime, violence, drink, drugs etc than about climate change. This work suggested that four emotions predominate in keeping climate change at the back of pupils’ minds:

- **FEAR** – that climate change is too big an issue:
“It’s scary because you think how can I help?”
- **DISEMPOWERMENT** – that they cannot have a worthwhile influence:
“We’re wasting our time when people in America and China are not bothered. They are causing most of it”
- **DENIAL** – conflicting evidence provides a ‘get-out clause’:
“I watched “The Great Global Warming Swindle” that said Climate Change isn’t man-made at all”
- **CYNICISM** – that the government uses the issue for social control:
“The Government uses [Climate Change] as a reason to increase taxes”

The Defra research also points to the prevalence of ‘denial’ highlighting that many children do not believe that climate change is completely down to human behaviour. Indeed Defra’s data suggests that only 21 per cent of young people believe that climate change is ‘totally’ down to human behaviour and 53 per cent believe that it is ‘mainly’ down to human behaviour.

In addition, the research by EdComs and Continental Research found that both parents and young people see climate change as a problem for future generations:

“I’m not so concerned. It will be more of a reality for my kids and grandkids” (parent)

“It may not affect us. Overall it will affect our children more than anything as they are the ones who will run out of fuel” (pupil)

It found that only 26 per cent of pupils believed that climate change would become a problem in their lifetimes, with 61 per cent believing it was a problem for future generations (4 per cent don’t believe climate is changing, and 9 per cent don’t know when climate change will become a problem). The Defra research indicated that 25 per cent of respondents believed that it would be more than 50 years before they were affected by climate change, or that they never would be.

Children’s awareness of their role in tackling climate change

The Allegra research noted that **‘children and teenagers...were aware of various ways to save energy at home’** including action such as not leaving appliances on stand-by, turning off the lights, switching off appliances not being used, insulating walls and roofs etc. However, it went on to point out that those who participated in the focus groups **‘were**

not necessarily implementing the energy



saving methods they were aware of’.

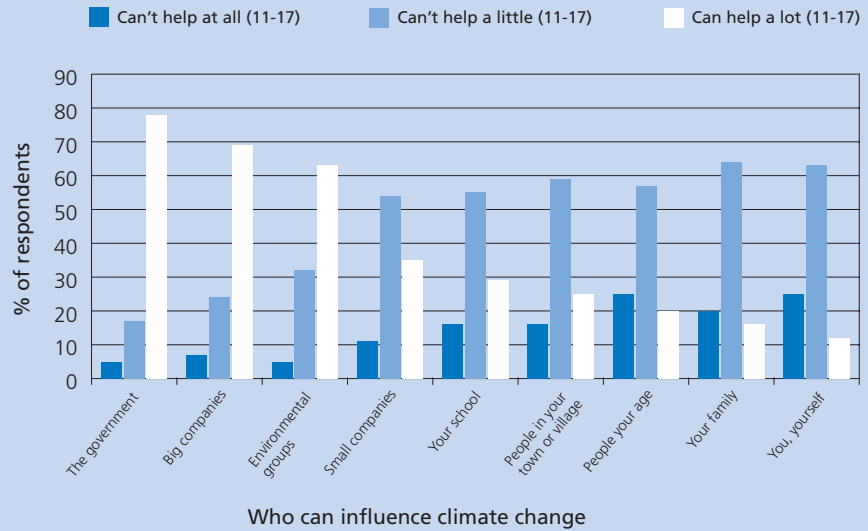
The EdComs and Continental Research reported that 80 per cent of students claimed to do one or more climate friendly activities either at school or home, including cycling and walking rather than taking lifts. However, the frequency with which these activities were undertaken was not measured.



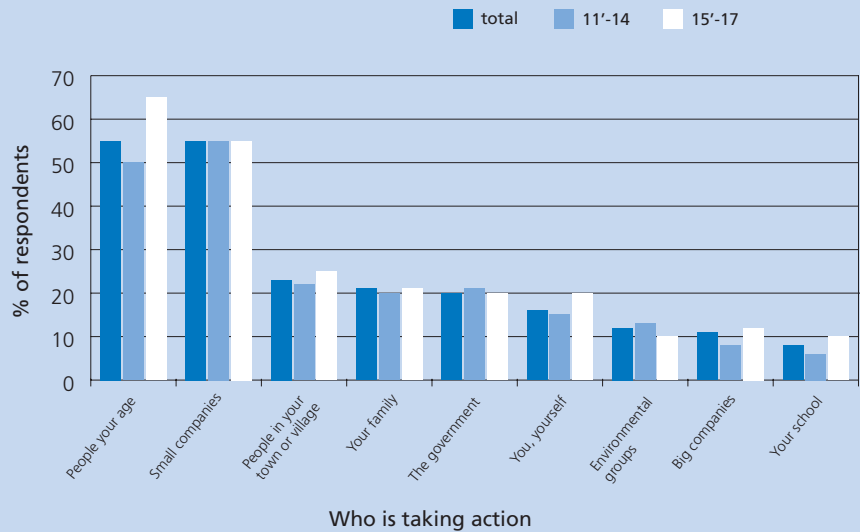
The Defra market research asked respondents whether they believed they could use less energy at home – over two thirds (70 per cent) agreed with this. It is interesting to note that respondents that had learnt about climate change at school were more likely to believe they could use less energy at home.

As shown in graph 1 in terms of their ability to influence climate change, of all the people that could have an influence of climate change respondents to the Defra interviews were least likely to believe that they themselves could help a lot (only 12 per cent gave this answer), although 63 per cent did believe they could help a bit. This compares to 78 per cent and 69 per cent respectively thinking that Government and big companies could help a lot. Those who studied climate change at school were more likely to believe that people their age could help a lot (12 per cent) than those who had not (9 per cent).

Graph 1: Children's perception of who can influence climate change



Graph 2: Children's perception of who is taking action to help slow down climate change



As shown in graph 2 over half of respondents to the Defra interviews claimed that people their age were taking action to help slow down climate change – rising to 65 per cent amongst those aged 15 to 17. Despite this, and rather disappointingly only 16 per cent claimed to be taking action themselves – rising to 20 per cent of those aged 15 to 17. This compares to figures from the Energy Saving Trust's research which shows that 60 per cent of adults claim to be taking action to tackle climate change.

It is interesting to note that respondents that claimed to have learnt about climate change at school were more likely than those that hadn't studied it to claim that they themselves were taking action (19 per cent vs 10 per cent). This suggests that education has played a role in either changing behaviour or making sure children were aware of how their actions impacted on climate change.

The research undertaken by EdComs and Continental Research provides further insight here. It suggests that students are sceptical that they can influence things at home for two main reasons, firstly that climate change is not discussed within the family and secondly because they feel that their parents are better informed and motivated by other factors (e.g. cost saving).

3.2 The extent to which climate change is being taught in schools

While aspects relating to climate change/ sustainable energy are required within some parts of the curriculum (for further detail and discussion see section 2.4), as far as we have been able to ascertain there is no research that comprehensively estimates the total number of schools that teach climate change, how they teach it, how frequently they teach it, and the extent to which consideration is given to the role of individuals in tackling it.

However, the recently published school 'self-evaluation, of progress on Sustainable schools shows that fewer schools believe they are 'doing well' in terms of delivering against the 'energy and water' doorway than they do with the other doorways. And the recent evaluation of Eco-Schools in Scotland⁴⁸ found that only 52 per cent of schools interviewed had addressed 'energy' issues to date and only 36 per cent had addressed 'transport' issues. This compares to 87 per cent believing they had addressed 'litter' and 79 per cent 'health and well being'. However, no consideration was given to how these issues were addressed so for example it is not possible to ascertain whether the schools that had 'addressed energy' had done so within the curriculum or in the school buildings or both.

In addition, the DfES Sustainable Schools Action Plan notes that **'...many universities and colleges providing initial teacher education and professional development for school staff, including senior managers and head teachers, do not currently**

⁴⁸ Evaluation of Eco Schools Scotland, the SCRE Centre, University of Glasgow, 2006

emphasise sustainable development in their programmes.’ And that while **‘some local authorities do provide high quality INSET programmes around sustainable themes...’the picture nationally is ‘far from consistent’.** It is worthwhile re-emphasising here that although climate change can be taught outside the remit of sustainable development within schools, it is an integral part of sustainable development. The impact of this lack of emphasis on sustainable development is unclear, however it is likely to some extent to translate into teaching poorer teaching of sustainable development in the classroom.

In addition, the quantitative and qualitative research undertaken by EdComs and Continental Research and the Defra qualitative research provide some insight into the extent to which climate change is being taught to specific age groups, and a piece of work undertaken on behalf of the Energy Efficiency Partnership for Homes (EEPfH)⁴⁹ also provides some insight into what is being taught at school in terms of home energy efficiency.

Insights from recent quantitative and qualitative research

The quantitative part of the research undertaken by EdComs and Continental Research reported that 97 per cent of teachers said that climate change was taught formally in lessons, whilst only 63 per cent of pupils said this was the case. The research report suggests that this rather large discrepancy could be the

result of infrequent coverage of climate change within schools resulting in the topic simply not registering with students. Indeed teachers reported that climate change was only usually covered once a term or less frequently.

The Defra quantitative research reported that 73 per cent of respondents claimed to have studied climate change at school (79 per cent of 15 to 17 year olds vs 68 per cent of 11 to 14 year olds), and of these 72 per cent claimed they enjoyed doing so. Both pieces of research reported a general interest amongst pupils in learning more about climate change. Half of the respondents to the Defra interviews wanted to spend more time learning about climate change, and 56 per cent of respondents that had not studied climate change said they would like to. And the EdComs and Continental Research research indicated that students were more interested than not about finding out more about specific climate change topics (including for example how students can help reduce climate change and the big solutions to climate change). The later piece of research also reported that teachers were very interested in finding out about specific climate change topics to provide input into lessons about climate change.

In terms of the extent to which pupils are taught about their role in tackling climate change, 98 per cent of teachers reported that ‘what pupils can do help reduce climate change’ was covered in lessons. In the qualitative part of this research pupils reported being taught about climate change in a limited way. In particular they suggested they were provided with few opportunities to discuss and debate the issue and given little scope to work



⁴⁹ Analysis of Home Energy Efficiency Education within the Formal and Informal Education Sector, CREATE for the Energy Efficiency Partnership for Homes, 2005

out implications for their own lives. Pupils also reported that information tends to be passively received and theoretical as opposed to action based. Indeed 82 per cent of pupils interviewed agreed that climate change in school needs to be more interactive, discussion based and involving.

The available research indicates that pupils do not tend to seek out information relating to climate change outside of the school environment. The Allegra research notes that most children claimed to have become familiar with the issue of climate change through school lessons and the general media. The available Defra data shows that the main source of recent information about climate change for respondents was television (mentioned by 63 per cent of respondents), followed by school (45 per cent). The findings from the EdComs and Continental Research research also suggest television and school as the main sources of information for pupils on climate change, and concludes that **'there is little evidence of a teen movement'**.

Whilst school and television are the main sources of information on climate change for pupils, the EdComs and Continental Research research found that students do not always find the information available clear. Of those interviewed 53 per cent reported to find the available information on climate change very clear (13 per cent) and quite clear (40 per cent), with 34 per cent finding it a bit confusing and 7 per cent very confusing. However, it appears there was no exploration of why this might be, it could for example result from children being provided with inconsistent information between teachers or

between the media and teachers, or finding the science confusing or for other reasons.

Research undertaken on behalf of the Energy Efficiency Partnership for Homes

This work aimed to determine the effectiveness of home energy efficiency education in both the formal and informal education sector in the UK. While the focus of this work was to identify the factors that increased and decreased the value of home energy efficiency education a number of its findings related to school based home energy efficiency education are of relevance, and as such are summarised below:

- School projects relating to home energy efficiency were not initially driven in order to satisfy requirements to teach about climate change. Both education providers and funders stated fuel poverty, intergenerational working, job skill development, social inclusion and education enrichment as reasons for project initiation not climate change or even energy efficiency.
- There appears to be more energy-related activity underway in primary schools than in secondary schools. The review identified very little energy-related activity at Key Stage 4 (14 to 16 year olds) and for 16 to 19 year olds.
- Very few energy-related initiatives are evaluated; of the 10 educational initiatives studied in the report none was found to have a formal outcome evaluation.
- All the school-based initiatives involved an external educator coming into school to deliver the activity, instead of or alongside the teacher.

Relevant resources available to schools

It has long been recognised that there is no shortage of sustainable energy initiatives that schools can take advantage of⁵⁰. Over recent years Government, NGOs, the private sector and others have developed a huge number of schemes and resources to help schools deliver education on the topics of climate change and energy. However, these initiatives are not always linked in a coherent way or made easily accessible to schools.

Over recent months DfES has developed a Sustainable Schools website which amongst other things provides links to a large number of available teaching resources⁵¹, and have committed to further exploring opportunities for **'tighter co-operation and co-development of initiatives at local and national level'**⁵². The Sustainable Schools website also contains a resource evaluation tool which suggests eight key questions that teachers can use to review sustainable development materials. One of these questions is 'Is the resource accurate and fair?'. In terms of climate change and sustainable energy this is a big question and one which teachers might require assistance with.

However, there appears to be limited information on the extent to which these initiatives are actually used in schools, how they are used, and the extent to which teachers find them useful. The EEPfH review (referenced above) being the only relevant piece of work identified.

3.3 Can education deliver behaviour change?

This report now considers the extent to which education can deliver energy-related behaviour change, by exploring:

- **Behavioural theory** – To what extent could education help overcome the psychological / sociological and the information related barriers? What does the theory say?
- **Real life examples** – Have educational activities delivered behavioural change in the past? What can we learn from previous initiatives?



⁵⁰ Sustainable Energy in Schools, Report of a seminar staged on the 14th December 2004, Energy Saving Trust and DfES

⁵¹ See: <http://www.teachernet.gov.uk/sustainableschools/library/library.cfm>

⁵² Sustainable Schools for pupils, communities and the environment (consultation), DfES, 2006



Behavioural Theory

The theoretical literature on pro-environmental behaviour change considers two types of barrier (Darnton, 2006) – 1) contextual (or external) barriers, and 2) psychological (or internal) barriers. It is the second of these that is of most relevance to this report. Behavioural theory tends to describe external barriers as those that result from the physical circumstances in which individuals live and work, and can limit, or indeed completely remove opportunities for individuals to undertake specific pro-environmental

behaviours. In terms of the barriers outlined in box 2 in section 2 all but barrier six (psychological/sociological) can be considered as external⁵³.

As noted above (section 2) the education of children and schools more generally could have an impact on tackling:

- internal barriers - psychological/sociological barriers, and
- the external barrier associated with lack of information.

⁵³ Note: There is no formal standardisation relating to the classification of internal and external barriers, and indeed there is some overlap (e.g. the external barrier of cost is relative and thus based on perceptions)

Tackling psychological / sociological barriers

Internal barriers

Internal barriers are the psychological barriers to adopting pro-environmental behaviours. In this context three fundamental barriers have been identified⁵⁴, relating to:

- Habit
- Norms
- Agency

These are considered in turn below. The role of values, beliefs and attitudes is then considered.

Habit

Research evidence shows that habit is one of the most significant internal barriers to pro-environmental behaviour change⁵⁵. Habitual actions tend to be those which are undertaken very frequently and, as Jackson 2004 notes, those which we use '*mental 'short-cuts'*' to perform⁵⁶. As such they are not subject to rational thought and do not require much conscious consideration. Because of this, habitual actions tend to be very hard to change, and mean that individuals can end up not acting or acting differently, due to force of habit and counter to their own intentions⁵⁷.

Everyday energy saving behaviours (minor changes to common routines) provide good examples of habitual behaviours, e.g. switching off the lights on leaving a room, not overfilling the kettle, and leaving appliances on standby. Recent research⁵⁸ has also found that habit has an important role to play in determining [student] car use.

A number of approaches have been suggested to tackle the barrier habit most notably:

a) a process of 'unfreezing' and 'refreezing' in which low consciousness actions are lifted up to scrutiny (usually in discussion) before being reconfigured and then put back into place to become new habits again ('refrozen') (Lewin 1951⁵⁹), and

b) practicing behavioural cues, such that when certain situations are encountered 'reflex' responses become habitual. It is worthwhile noting that many of these techniques for breaking bad habits and establishing good ones involve face to face interaction (or facilitation), often as part of a group.

As such tackling this barrier would seem to be particularly well suited to being undertaken in schools.

⁵⁴ Darnton, A 2006. Promoting Pro-Environmental Behaviour: Existing Evidence to Inform Better Policy Making, Chapter 1: Theory. Andrew Darnton for CfSD at the University of Westminster and Defra CAD, June 2006.

⁵⁵ Darnton, A 2007 EST 'Local Action Works' Stage1: Review of Theory, 15 Principles. Andrew Darnton for the Energy Saving Trust

⁵⁶ Jackson, T 2004, Motivating Sustainable Consumption – a review of evidence on consumer behaviour and behaviour change

⁵⁷ Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Shaping the energy-related behaviour of future consumers, desk research, December 2006

⁵⁸ Bamberg, S and P Schmidt 2003. Incentives, Morality, Or Habit? Predicting Students' Car Use for University Routes With the Models of Ajzen, Schwartz, and Triandis. Environment & Behavior 35 (2), 264-285.

⁵⁹ Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Shaping the energy-related behaviour of future consumers, desk research, December 2006

Norms

Darnton (2006⁶⁰) describes norms as relating **'to an individual's sense of appropriateness of undertaking a behaviour, and can be defined as an individual's perception of how society would expect them to act in a given situation'**. As such norms can act as both a driver and a barrier to pro-environmental behaviours in that individuals will tend to follow what they perceive to be social norms. Darnton highlights that all energy-related behaviour (and lack of) is affected by norms, including transport related behaviour.

Darnton also notes that the theory recommends that behaviour change interventions aim to ensure that social norms are aligned with the behavioural goals they are encouraging individuals to pursue. The expectation is that once behaviours have become normative they will be sustained among the majority of members of the public. One example of this is recycling, which has moved over recent years from being a behaviour outside of social norms to a behaviour which is now seen as being in line with societal norms. Thus people are likely to change their energy related purchasing and routine behaviour when it is perceived as being normal to do so. While aligning social norms with behavioural goals is not necessarily an easy task it would appear to be one that education could contribute to, given that schools form part of the society within which children live and spend their time.

Agency

Agency tends to be represented in the theory as containing two components:

- a) an individual's sense that they can undertake a specific behaviour (and see it through to a result), and
- b) their sense that undertaking the behaviour would make a difference to the wider problem their behaviour is aiming to tackle (Darnton, 2006). For example, tackling climate change is often discussed in terms of agency - first of all individuals have to believe that they can actually change their behaviours and secondly they need to believe that if they do so these new behaviours will have a significant or worthwhile impact on climate change.

Many sources in the literature identify that group discussions and debate can be an effective means of overcoming low agency (Darnton, 2006). Working together in a group allows people to identify and subsequently undertake actions that as individuals they might have felt unable or unwilling to undertake. If those actions are successful, it is likely that enhanced agency will result. Again, it would seem that action to overcome low agency might be particularly well suited to being undertaken in schools.

It is also worthwhile noting that agency is commonly seen to include an emotional component – not only do people need to take responsibility, but they need to develop an emotional commitment to taking action, and see it through. In this context it is interesting to

⁶⁰ Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Shaping the energy-related behaviour of future consumers, desk research, December 2006

note that our market research suggests that (for some segments of the population) there may be a link between having children and an increased emotional commitment to tackling climate change⁶¹.

“When you have young kids you do feel you want to do more for the environment... I think it is common sense for everybody; we have to think about resources”

“I have always been fairly conscientious, but now I have children it has definitely made a difference. I think a lot more about it and I want to make a difference now”

“I’m very concerned about the future for children and grandchildren and feel worried about the potential problems they will have”

“The ice cap is melting and will be gone in eight years....are my kids going to grow up and not know what polar bears are?”

These quotes together with the findings of the research outlined in section 3 also highlight an interesting point – each generation seems to think that climate change is an issue for the next generation.

While developing an emotional commitment to taking action and seeing it through (i.e. an individual believing they can do something and that doing this something will make a difference) is an important aspect of agency, emotional commitment is also more generally important in behaviour change in that individuals need to believe not only that they can do something but that it is their responsibility to do something.

Values, Beliefs and Attitudes

In terms of tackling the internal psychological/sociological barriers to behaviour change Darnton (2006) highlights that the factors driving different energy-related behaviours vary widely, and to illustrate this cites the example that many more people switch off lights in unused rooms than turn off appliances rather than leaving them on standby. Indeed the Energy Saving Trust’s market research shows that 50 per cent of consumers report that they turn off lights but only 34 per cent say that they turn off appliances rather than leave them on standby. So, while these behaviours seem closely related they are not deemed to be so by the public. For this reason the bulk of behavioural theory recommends that in order to change a particular behaviour it is necessary to focus solely on that particular behaviour and employ all the tools available to change it.

Darnton (2006) also points out that while all pro-environmental behaviours are different **‘motivational factors (including values, beliefs and attitudes) represent a common thread linking seemingly diverse pro-environmental behaviours together’**. While the theoretical literature notes that these factors play a relatively minor role compared to external factors in determining the outcomes of any one specific pro-environmental behaviour, it does suggest that such factors tend to be more stable over time than behaviours themselves. As such whilst an external factor may cause a change in behaviour, without motivational factors supporting the continuation of that behaviour then people may revert to their original



⁶¹ Haslam Associates (for the Energy Saving Trust), Consumer Attitudes Towards Microgeneration Technologies, November 2005

behaviour or another non-environmental behaviour if the external factor is removed. Whilst it is noted that these motivational factors play a relatively minor role in terms of delivering any particular behaviour change, their importance to the continuation of current pro-environmental behaviours, and, in combination with other measures the uptake of new pro-environmental behaviours, should not be underestimated. Darnton highlights that motivational factors are likely to have a longer lasting effect on pro-environmental behaviours across the board than would tackling the external barriers to encourage a specific behaviour.

Tackling the 'lack of information' barrier

The Value Action Gap

It is widely accepted that pro-environmental knowledge alone does not lead to pro-environmental attitudes and pro-environmental attitudes alone do not lead to pro-environmental behaviours. Thus, people can have pro-environmental attitudes but do not necessarily back these up with pro-environmental behaviours. For example, someone can believe that switching off the lights when they leave a room will make a contribution to tackling climate change and that this is the 'right' thing to do – yet they still leave the lights on whenever they leave a room. This concept is commonly known as the Value Action Gap.

The theoretical literature concludes that information is a necessary but not a sufficient condition on its own to encourage pro-environmental behaviour change.

Behaviour change and age

The theoretical evidence reviewed as part of this research provided little evidence about the most effective point, in terms of behaviour change, at which to undertake environmental education with young people. However, the education literature suggests that younger (primary school-aged) children are easier to engage in environment-related educational activities, while older pupils are more likely to present a disruption influence in such activities⁶².



⁶² Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Shaping the energy-related behaviour of future consumers, desk research, December 2006

3.4 A role for education in changing behaviour?

The theory discussed in the preceding section suggests that education and awareness raising activities can serve as effective drivers of pro-environmental behaviours. Indeed Darnton 2006 concludes that based on behavioural theory **'education can be seen as putting in place the essential foundations for delivering long term behaviour change, although it is not alone sufficient to bring about pro-environmental behaviours'**.

More specifically Darnton uses the theoretical evidence to identify seven roles for education in encouraging pro-environmental behaviour.

These roles range from the provision of information (for example where a consumer could get a grant for an energy efficiency measure, or about an individual's role in reducing society's impact on climate change), to working on the more attitudinal factors which can underpin a variety of pro-environmental behaviours, to providing a context within which individuals can debate with each other, learn from experience, and experience change of attitudes, motivations, and behaviours. It is worthwhile noting that the theoretical literature highlights the efficacy and appropriateness of action learning techniques (for further detail see point seven below) in delivering [adult] behaviour change. The seven roles are as follows:

1) Providing factual information relating to local service provision

e.g. the times of local public transport, the details of the local Energy Efficiency Advice Centre/SEC.

2) Raising awareness of individuals' opportunities for undertaking pro-environmental behaviour, and their role in reducing society's environmental impacts.

3) Encouraging the development of pro-environmental beliefs, and positive attitudes to specific pro-environmental behaviours.

4) Tackling the psychological barriers of norms, agency and habits, often through participatory group work.

5) Building an individual's sense of emotional investment in environmental protection, often through their active involvement in conservation work or experiential learning.

6) Presenting a forum within which viable strategies for sustainability can be worked out by individuals themselves.

7) Initiating 'action learning' groups in which individuals engage in cycles of action and reflection, where the focus is on addressing an agreed problem through undertaking collaborative actions, the impacts of which are reflected upon by the group. The actions result in learning, both experientially, and through the ongoing process of redefining the problem in the light of experience. Meanwhile change is generated as a result of both the actions undertaken and the debate, encapsulated as 'reflective practice'.

3.5 Real life examples – have educational activities delivered behavioural change in the past? What can we learn from previous initiatives?

As discussed above this research was undertaken in the knowledge that there is very little available research relating to the role that educating children could play in delivering energy-related behaviour change in both the short and long term. For this reason the research drew not only on the theoretical literature but also on 'real-life' examples including those from other behavioural subject areas in addition to energy. These are discussed below – and categorised by evaluated impact:

- in the long term,
- in the short term,
- of household members, and
- in the community

This section of the report also considers the evaluation of the Eco schools programme which is particularly relevant because it provides an insight into the impact of perhaps the largest scale environmental programme for schools.

The research identified a number of projects where evaluations had been carried out to determine the impacts (including behavioural) of education. Of these only one related to energy.

The majority of evaluations measured short term impacts, and most tended to evaluate impacts on knowledge and awareness as well as levels of pupil and teacher satisfaction with the learning activities involved, rather than measuring behavioural impacts.

A limited number of evaluations were found that measured behavioural intentions and impacts, and some of these did so over time, but these tended to be follow-up surveys over a period of a year or less. This is likely to reflect, at least in part, the difficulties associated with undertaking longitudinal studies – including expense, practical difficulties and difficulties with attributing causality to one particular initiative over time (for further discussion see Darnton, 2006).

The survey of EnR members (referenced in section 1), summarised in Appendix 1), did not uncover any evaluations of schools programmes in relation to behaviour change. However, some of the programmes being undertaken across Europe are interesting in their own right, see for example, box 3 which provides a brief summary of the Energy Survival programme in the Netherlands.

Box 3: Energy Survival in the Netherlands

In 2005, SenterNovem, the Dutch Broadcasting Corporation, a publishing company and a consortium of local authorities launched 'Energy Survival'. The initiative uses a range of media including national TV (on which the 'Energy Survival' game) is broadcast), internet, local events and work with primary schools. Through entertainment, Energy Survival aims to influence children's attitude towards energy consumption how this relates to the wider environment. It aims to empower children to become 'energy ambassadors' in their own local environment: family, school and neighbourhoods. Key results to date are:

- The first series of the Energy Survival on national television had ratings of approximately 200,000 viewers, mostly children with their parents. In terms of market share, Energy Survival is reaching a market share of approximately 20 per cent in the age group 6 to 12 years.
- The TV-show turned proved to be a family show with parents regularly tuning in with their children.
- Research found significant differences in attitude between the viewers of the TV-show and the people that did not see the show. Specifically the research showed that children, who saw the show, discussed energy issues more with their parents than those who did not, and showed a greater understanding of the subject.
- Since the beginning of the project 300 primary schools have applied for the digital teaching programme associated with the initiative.
- 20 local and regional administrations have signed up to participate in the project and promote the programme among and their inhabitants. Through these local administrations, the project Energy Survival currently reaches about 1.5 million inhabitants, about 10 per cent of the total Dutch population.
- Recent evaluation work has indicated that after their contact with the Energy Survival programme children reported that they made more effort to save energy around the home, and discussed energy issues more with their parents, other relatives and schoolmates, and approximately 50 per cent of parents reported that they had become more aware of the importance of energy saving and renewable energy and were actually taking action in these areas.

Delivering long term behaviour change

The research identified that there was very little available evidence on the long term impacts of educational and awareness raising activities on behaviour. Only two initiatives were found to have been evaluated in terms of their long term behavioural impacts with neither providing conclusive evidence of long term behavioural impacts. However, given the difficulties associated with undertaking longitudinal research this is perhaps not surprising.

These initiatives together with details of their evaluations are summarised in box 4.

In the context of the evaluation of the long term behavioural impacts of educational activity it is worthwhile highlighting the current eight-year longitudinal evaluation of the Citizenship curriculum in English secondary schools, being undertaken by the National Foundation for Educational Research. This evaluation is designed to investigate the impact of Citizenship teaching on young people's 'knowledge, skills, attitudes, and behaviour' in both the short and longer term. The study began in 2002 and still has three years to run. However, Darnton (2006) notes that **'it appears that the study will not produce hard evidence on the impact of Citizenship teaching on young people's pro-environmental behaviours, in the short or longer term'**.



Box 4: Evaluations of the National Trust Guardianship scheme and of Service Learners in the USA

The National Trust (NT) Guardianship scheme

The NT Guardianship has been running since 1989 and currently involves more than 100 (usually primary) schools in England and Wales. It aims to provide students with the opportunity of:

- a wide range of practical activities that support the National Curriculum
- getting involved first hand in worthwhile practical conservation projects
- exploring and connecting with their local environment
- making full use of the local National Trust site and resources
- building awareness of, interest in, and responsibility for the natural environment.

A recent evaluation traced and interviewed students who went on trips to NT sites five years (or more) ago. The key indicator of behavioural impact used in the evaluation relates to building a sense of ownership between the student and their local environment, specifically the NT site they worked on. Reported rates of visiting the NT site in question were used to measure this. The evaluation found that 68 per cent of respondents claimed to visit the site regularly, and 35 per cent had individual/family membership to the site. However, the evaluation did not relate these figures relate to national or regional averages from non-guardianship young people, nor did it consider causality.

Service Learning in the USA

Service learning is an extension of community service which is a mandatory part of many American students' schooling, with a reflective or instructional element added on to the community service activity itself. The study was conducted among a large random sample of adults aged 18 to 28 years old, of whom a significant proportion had undertaken service-learning during their schooling. Ex-service-learners were found to be volunteering at far higher rates than other adults. However, no consideration was given to whether it was in their nature to volunteer or whether they 'learnt' to value volunteering as part of their service learning. Despite there being a control sample no effort was made to establish the causality behind the observed differences between different respondent groups. Furthermore the survey did not identify any key behaviours which might serve as indicators of the impact of the service learning experience.

Delivering short term behaviour change

Evidence of short-term behavioural impacts on children's behaviour was found in a number of initiatives, with the most comprehensive data being from the field of safety education. Specifically from evaluations of the Lifeskills Learning for Living programme and from the initial pilot of the Kerbcraft programme. Summaries of these programmes can be found in box 5 below. The results of both programmes suggest they resulted in positive short term impacts on children's knowledge and behaviours.

In this context it is also worthwhile reiterating the findings of Defra's Attitudes to Climate Change Youth tracker (reported in section 3) which found that respondents who claimed to have learnt about climate change at school were more likely than those that hadn't studied it to claim that they themselves were taking action. This suggests that education could have played a role in either changing behaviour or making sure that children were aware of how their actions impacted on climate change.

Box 5: Short term behaviour change – safety education

Lifeskills - Learning for Living Programme

The Lifeskills centre is an indoor safety education and training centre built as a realistic village. The 'village' has a road, a supermarket, houses featuring realistic bathroom, bedroom, living room and kitchen sets, a garage, garden, electric substation, building site, playground, stream, railway line, farmyard and country lane. It aims to help children aged between 10 and 11 learn about safety in a practical way and to bridge the gap between knowledge and behaviour by being interactive and hands on. An evaluation of the Lifeskills learning for living centre was undertaken in 2001-2003. Results from this evaluation found children who had participated in the Lifeskills programme performed twice as well in performance tests and three times as well in knowledge tests than control children.

Kerbcraft

The Kerbcraft programme is designed to teach pedestrian skills to 5 to 7 year olds by means of practical roadside training rather than in the classroom, with children being taught by trained volunteers near their schools. An evaluation of the initial Kerbcraft pilot programme found that it had been successful in changing children's road crossing behaviours, and that their new safety behaviours were significantly retained at a two month follow-up test.

However, other evaluations suggest little impact on behaviour. In the context of delivering short term behaviour change a considerable amount of work has recently been undertaken by ENCAMS to inform the delivery of campaigns to change teenagers' littering behaviour. This included the evaluation of a series of pilot projects⁶³ together with face-to-face interviews with teenagers, research to explore the sociology of 'teenagedom' and an analysis of teenage and litter semiotics^{64, 65}. The fact that little impact on behaviour was observed as a result of the pilot schemes suggests that the methodology used, or indeed even the behaviour that the programme is

aiming to change is likely to have an impact on whether that behaviour is changed or not. This broadly mirrors the evidence from the literature on behaviour theory. However, it might also reflect differences between teenagers' behaviour and that of younger children.



Delivering household behaviour change

Evidence of the impact that educating children could have on the behaviour of other household members was found in evaluations of the Centre for Sustainable Energy's Energy Matters Programme and Groundwork's SORT-It! Recycling programme in Leeds. The results from the Energy Matters Programme are particularly relevant because the programme focuses on energy-related behaviour, and are therefore not subject to the inherent uncertainty of transferring lessons and principles from energy-related initiatives to other behavioural areas.

Details of these initiatives and their evaluations can be found in boxes 6 and 7.

⁶³ Note: The ENCAMS pilots did not focus on formal education – they involved reward schemes, naming and shaming, the use of wardens etc

⁶⁴ I'm just a teenage dirt bag, baby! ENCAMS, 2004

⁶⁵ Semiotics is the study of the meaning that images and objects project.

Box 6: Energy Matters

Energy Matters

The Centre for Sustainable Energy's Energy Matters programme began in 1999, and aimed to 'promote awareness of energy conservation issues, and to encourage **behaviour which conserves energy, among both children who receive the education directly and among adults (i.e. the children's parents, guardians or carers)**'. The programme provided education materials linked to the curriculum and ongoing support for teachers through local Energy Educators who delivered the programme.

An evaluation of the programme was undertaken in 2003. By means of interviews with parents, pupils and a range of staff it aimed to '**evaluate the effect, on energy efficiency activity, of Energy Matters on the schools and homes of participating pupils**'. The evaluation did not attempt to evaluate the impact on pupils' current energy-related behaviour.

The evaluation found that 76 per cent of parents claimed to have changed their energy-related behaviour as a result of their children's involvement in Energy Matters, and 54 per cent claimed to have installed energy-saving measures including low-energy light bulbs, energy efficient appliances and home insulation improvements. This rate of conversion to action was found to be similar to that among the comparison sample of adults who had approached EEACs for energy-related advice. Comments from parents interviewed about the impact their children had had on their energy-related behaviour included:

"I think it's made us more aware of leaving the lights on and keeping doors closed – to keep the heat in...Because he was so keen on saving energy and being more environmentally friendly, it has made you think more about it".

"We've actively started using the timer on our heating and water heater. We turn appliances off and light bulbs off. We're having double glazing replacing our secondary glazing".

It is worthwhile noting that the evaluation included an explicit question to parents about the factors that had influenced their decisions to install or plan energy efficiency measures in their home or to change their behaviour to save energy. The evaluation found that parents who had done something about energy efficiency rated the influence of their children and Energy Matters as almost twice as influential as other sources such as books, magazines, papers, radio and advice from friends, family, fuel companies or Energy Efficiency Advice Centres.

The results of the Energy Matters programme are backed up the results of a questionnaire sent to parents of children from Sytchampton Endowed First School in Worcestershire, which were reported in the Guardian⁶⁶. The questionnaire aimed to find out how effective “green teaching” had been in getting children’s households to change their behaviour. In response to the questionnaire 96 per cent of parents said they were making more energy savings at home since the scheme started. The deputy head is also quoted as remembering one parent saying to her:

“Can you please tell my daughter that we are allowed to have some lights on- she’s got us sitting in the dark like mushrooms”

Box 7: Sort-It Recycling project

Sort-It Recycling project

SORT-It is a recycling education project in Leeds. The main aim of the project is behavioural – to teach primary school children how to properly sort the six items of waste that can go in their family household’s green SORT bin for kerbside collection. The children are encouraged to take these learnings home in order to encourage greater compliance with the collection mechanism.

The programme is provided by a partnership between Groundwork Leeds and BTCV and involves project workers visiting primary schools and performing drama-based assemblies, as well as leading painting workshops in which pupils make their own posters with the SORT It message on. The pupils are encouraged to take those posters home, along with further information. While the posters focus on which size items can properly be placed in the SORT It bins, the other key message of the campaign involves reducing contamination of discarded waste (both by not putting glass in normal (landfill) bins and by not putting food waste in the SORT It bin with clean recyclates).

An evaluation of the SORT-It project was undertaken by Groundwork Leeds in 2006, based on visits to 48 local schools between October 2005, and March 2006. The principal method used for the evaluation was analysis of ‘hard’ waste data.

Across the Leeds city council SORT-It bin area the level of contamination in SORT bins was found to have fallen. In addition on one particular SORT-It bin collection round set-out rates by households increased by 50 per cent during the sort it education project. It is notable however that no attempt is made to isolate the contribution of SORT-It to these observed improvements in recycling behaviours. Instead, data are cited from post-workshop questionnaires undertaken with participating children; this reveals improvements in pupils’ knowledge of the SORT-It arrangements in the immediate term (90 per cent of KS2 pupils could consistently identify the six SORT bin waste items).

⁶⁶ Pester Power, Bibi van der Zee, Guardian 01.02.2007

The work of David Uzzell et al⁶⁷ is also of relevance in this context. The work in question involved research in four EU countries – Denmark, France, Portugal and the United Kingdom, and amongst other things aimed to examine **‘inter-generational learning through the transference of personal experiences typically from the child to the parent/other adults/home’**. The work found that **‘what children learn about the environment, and the extent to which they are catalysts of change in respect of adults, including their parents, is greater among children from a background where:**

- i. the level of consciousness, knowledge and concern for the environment is greater,**
- ii. parents are in the habit of helping their children with schools work and extra-curricular activities,**
- iii. discussions about the environment as well as other subjects that are of interest to children are part of every day life’**

The work also highlighted that **‘Catalysis can occur at different levels. It may not occur at an action level, but it could occur at an awareness knowledge or attitude level: these could be the first steps on the way to children actually galvanising their parents and the wider community into sustainable environmental actions.’**

In other words educating children about environmental issues can be useful in terms of them passing messages on to their parents, but certain preconditions need to be in place for to maximise its benefits. In addition it suggests that such education will not necessarily lead directly, or indeed at all, to behavioural change.



⁶⁷ David Uzzell et al 1994, Children as Catalysts of Environmental Change (European commission directorate General for Science Research and Development Joint Research Centre: DGXIV/D-5 research on Economic and Social Aspects of the Environment (SEER I): contract No. EV5V-CT92-0157

Delivering community wide behaviour change

The review undertaken by Andrew Darnton (2006)⁶⁸ concluded that **‘There is some evidence that schools’ activities can have an impact on public behaviours in the wider communities in which they are situated.’** but that **‘Most of this evidence relates to the impact of schools’ teaching activities on the behaviours of parents resulting from pupils taking schools work and related messages home’.** However, it is worthwhile noting that some community results have been reported at individual school level as part of the extended schools initiative.⁶⁹

Thus there appears to be little available evidence on the impacts on those community members who do not have children. And Darnton (2006) concludes that **‘The reasons for this lack of evidence...principally relate to the difficulty of identifying meaningful measures of community change, which could in turn be traced back to the impact of the school itself.’** Despite this lack of evidence a number of current schools related initiatives aim to deliver community wide behaviour change for example the Extended schools and Citizenship initiatives both require schools to play a part in changing

behaviours in the wider community – to tackle area deprivation and to transform the democratic life of whole society respectively (Darnton, 2007). And the 2006 Sustainable schools consultation highlighted a Government aspiration that by 2020 all schools should be **‘...models of energy efficiency and renewable energy, showcasing wind, solar and biofuel sources in their communities....’**

In the context of delivering community wide behaviour change the concept of the ‘whole school’ approach is also relevant as these aim to work with the whole school community (i.e. everyone who comes into contact with the school) and often with the wider community. Further details about the whole school approach can be found in box 8.

While there is a general lack of information in terms of impacts, the evidence that is available and reviewed by Darnton 2006 suggests that community involvement may help children to improve their energy related behaviour and schools/children seeking to work with communities as part of wider sustainability programmes could help to deliver community wide behaviour change.

⁶⁸ Andrew Darnton Research and Analysis Limited (for the Energy Saving Trust), Shaping the energy-related behaviour of future consumers, desk research, December 2006

⁶⁹ Extended Schools are seen as a key way of delivering Every Child Matters, and a key vehicle for delivering the Government’s objective of lifting children out of poverty and improving outcomes for them and their families. Extended schools work with local authorities, local providers, and other schools to provide access to a core offer of integrated school services – these include a varied range of activities including study support, sport and music clubs etc, parenting and family support, access to targeted specialist services, and community access to facilities.

Box 8: the whole school approach

In 1993 (the then) DfE defined a whole school approach as “practice what you teach” (cited in Shallcross et al 2006). In practice this means embedding a common set of priorities in the schools’ management practices, the schools’ teaching activities and the values or ethos of the whole school. Darnton (2007) highlights that **‘these values should be consistent both in terms of schools’ internal facing practices and the practices that bring them into contact with the wider community (including parents, governors, local authorities and commercial partners and suppliers)’**.

‘Learning by doing’ is a key part of a whole school approach with the activities of the school becoming opportunities for learning and participative methods are used to deliver the curriculum. From an energy perspective ‘whole school’ approaches tend to involve using the school building as an educational resource, including pupils in the school’s energy management system, and encouraging all school energy users (pupils, teachers, janitors, governors, administrative staff, cleaners etc) to play a role in reducing the energy used within the school. Darnton (2007) also points out that whole school approaches often incorporate community-based learning and project work.

Recent research has indicated that whole school approaches could be a particularly effective means of changing the culture within schools in relation to energy use. Notably, recent research by the Sustainable Development Commission (SDC) highlights that the installation of micro generation technology has the potential to motivate culture change within schools, but this depends crucially on how actively the teaching staff integrate it into learning activities⁷⁰. This work was however qualitative and the conclusions based on only 29 interviews with households and schools that had already installed microgeneration technologies. It is not therefore appropriate to assume that such impacts would apply across the board. In addition, the evaluation of Energy Saving Trust SchoolEnergy programme, which ran from 1996 to 2002 and employed the ‘whole school’ approach noted that **‘random assessments and anecdotal evidence received by CREATE has provided some evidence of the impact of the whole school’ approach on children. For example, many schools have developed rosters for students to be ‘Energy Monitors’ (or in some cases, ‘Energy Detectives’), fostering strong enthusiasm and commitment to energy efficiency information in their classrooms, introducing energy consumption as part of daily school life.’**

Darnton (2007) highlights that because whole school approaches incorporate community-based learning, project work and opportunities for pupils to enact their learnings, they are especially appropriate when a behaviour change element is involved as the sustainable behaviours seem normative (i.e. everybody practices what they teach). This is particularly important as norms have been identified as one of the key psychological/sociological barriers to pro-environmental behaviour change.

⁷⁰ ‘Sustainable Development Commission, Seeing the light: the impact of micro-generation on the way we use energy, October 2005

The Eco Schools Programme

As noted above the EcoSchools programme is perhaps the largest scale environmental programme for schools in the UK. The EcoSchools programme in Scotland has been

the subject of a recent University of Glasgow evaluation. Further details about the programme and its recent evaluation can be found in box 9.

Box 9: The Eco Schools Programme

Eco Schools is an international environmental initiative for schools that was introduced across the UK in 1995. It aims **‘to make environmental awareness and action an intrinsic part of the life and ethos of the school for both pupils and for staff and to engage the wider community’**. Eco Schools is an award scheme that accredits schools that make a commitment to continuously improve their environmental performance. It is also a learning resource that aims to raise awareness of environmental and sustainable development issues throughout activities linked to curricular subjects and areas.

In 2006 an evaluation of EcoSchools Scotland was undertaken by the SCRE Centre at the University of Glasgow. Its aim was to **‘evaluate the perceived effectiveness of the EcoSchools Programme in developing pupils’ awareness and in changing their behaviour in respect of the environment.’** The evaluation consisted of a survey which was sent to a sample of EcoSchool schools (the schools were left to decide who should respond – this could be pupils if deemed appropriate), and for secondary schools members of the EcoCommittees were also sent a questionnaire.

The report suggested that findings from the pupils’ survey indicated a perception that involvement in the Programme had impacted on behaviour to some extent. The secondary pupils who responded to the survey considered that their peers were now more likely to recycle paper, glass etc, and less likely to drop litter. In addition, the results of a survey sent to the school suggested that there was a strong consensus that **‘involvement in the Programme has had a positive impact on pupils’ behaviour in respect of the environment’**. However, no consideration was given to whether such behaviour changes occurred in other aspects of the pupil’s lives (i.e. at home as well as at school), and no quantitative assessment of actual behaviour was undertaken.

Interestingly the evaluation also found that the Programme was perceived to have had relatively little effect in raising awareness of issues such as climate change. It also highlighted a distinction between the different issues faced by primary and secondary schools, noting in particular that **‘secondary pupils not only have to contend with the apathy of some of their peers, but also with a growing awareness of the more intractable nature of some of the environmental problems we all face.’**

The evaluation also stressed the initiative should not be expanded further if this was at the expense of schools treating the awards element as a box-ticking exercise (i.e. that they could gain the accreditation but without embedding the necessary values).

Part 4: Quantification of the carbon impact that education could have

4.1 Children's current use of energy and the potential to reduce this

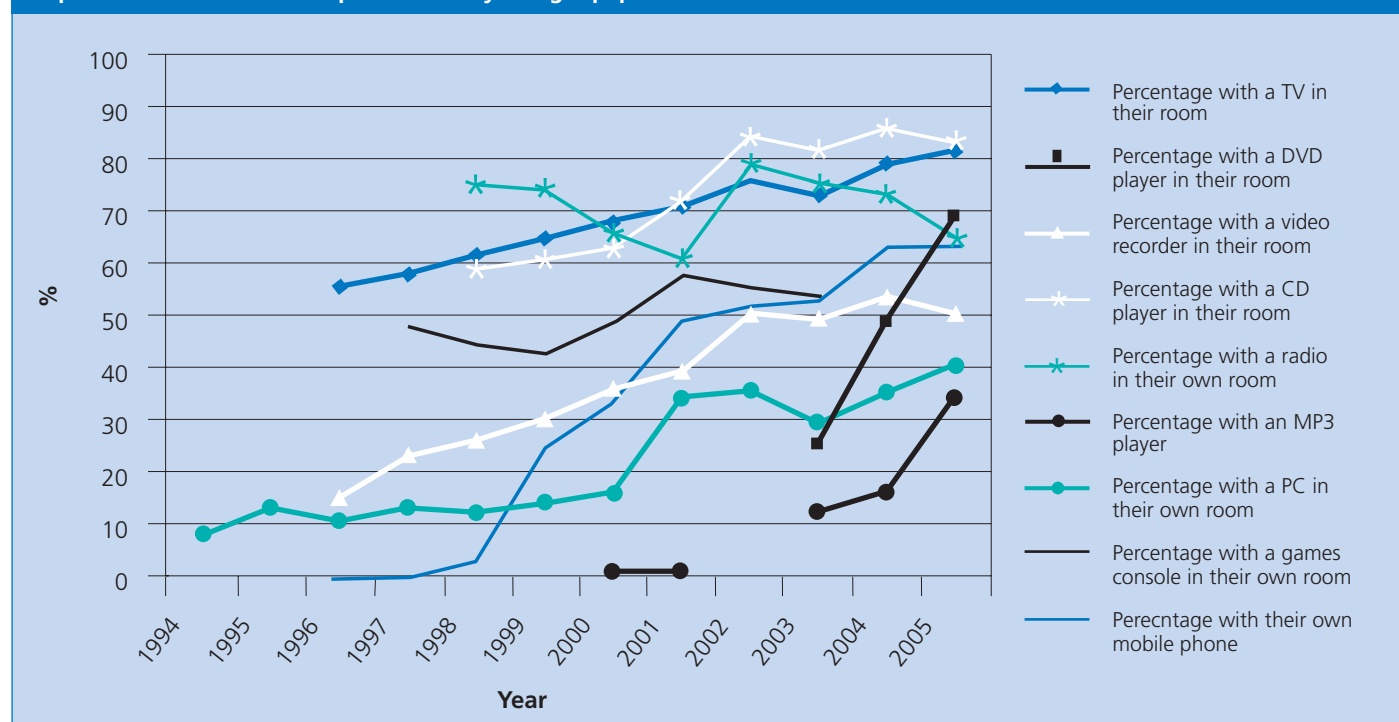
The current population of the UK is just over 60.2 million people⁷¹. Of these people it is estimated that 8.95 million or 15 per cent are children of school age.

The ability of educational activities to change children's energy-related behaviour is only going to be relevant if children do in fact use energy. ChildWise⁷² undertake an annual face-to-face individual in-depth interview survey of 1200 children across England via 60 schools, this includes tracking the ownership of some electronic equipment amongst children and teenagers, specifically the percentage with: a TV in their room, a DVD player in their room, a

video recorder in their room, a CD player in their room, a radio in their own room, an MP3 player, a PC in their own room, a games console in their own room, and with their own mobile phone⁷³.

The survey indicates a broad trend of increasing product ownership (i.e. an increasing number of children owning products) and of increasing numbers of products owned by children, with for example 82 per cent and 41 per cent of children now claiming to have a TV and/or a PC respectively in their room. This compares with 58 per cent and 14 per cent respectively in 1997. Further details can be seen in Graph 3. Table 3 shows the potential carbon savings from children's use of their own electricity-using products.

Graph 3: Children's ownership of electricity using equipment 1994-2005⁷⁴



⁷¹ <http://www.statistics.gov.uk/CCI/nugget.asp?ID=6>

⁷² ChildWise Monitor, The trends report, ChildWise 2006

⁷³ Clearly only a selection of products are covered in the survey. It is likely that more will be owned, for example hair irons, hairdryers, electric toothbrushes etc.

⁷⁴ ChildWise Monitor, The trends report, ChildWise 2006

Table 3: Potential carbon savings from children's use of their own electricity using products					
		Current consumption		Potential savings	
Product	UK ownership - children (millions)	Costs (m£/yr)	Carbon (tC/yr)	Potential annual energy bill savings (m£/yr)	Potential annual carbon savings (tC/yr)
TV	7.37	25	28,000	6.1	6,800
DVD	6.26	10	12,000	8.7	9,700
VCR	4.46	16	18,000	13	15,000
CD Player	7.56	52	58,000	52	58,000
Radio	5.96	23	26,000	22	24,000
MP3	3.24	0.9	1,000	0.63	700
PC	3.77	79	88,000	39	44,000
Games Console	5.66	24	26,000	8.4	9,400
Mobile Phone	5.90	1.2	1,400	0.84	940
Total		230	260,000	150	170,000

In the context of household energy use children are also likely to have some influence over lighting use – i.e. the extent to which they use lighting and leave lights on; heating and hot-water use – i.e. the amount of hot water they use; and where they have TRVs in their rooms the temperature they select. There is very little data on the contribution of children to these aspects of overall household energy demand. Available evidence suggests that couples with dependent children use slightly less hot water than the mean whereas lone parents with dependent children use around six

litres more per person than the mean. It also indicates that those in larger households (five or more people) are more economical with their hot water, particularly for baths and shower usage⁷⁵. However, it is not clear whether children are counted as 'people'. Further research would be useful to explore the role of children in determining household energy use, the family dynamics that surround this and the impact that other factors have on family energy use (for example house and household size) and the interaction between these factors.

⁷⁵ <http://www.dti.gov.uk/files/file16568.pdf>

4.2 Children's influence over household energy use

In the UK 29.1 per cent of households have dependent children⁷⁶. If, as the evidence from specific initiatives suggest, children can change the energy related behaviour of their parents and other household members, the carbon savings could be significant.

Table 4 illustrates the potential UK carbon and financial savings using the reported impact of the Energy Matters programme. It is important to bear in mind that these figures are calculated from limited data, and as such should be treated as indicative only. In addition, these carbon savings will overlap with those from other programmes. It is also important to bear in mind the conclusion from Uzzell's work that the extent to which children can influence their parent's behaviour relies on a number of specific conditions being in place. As such the figures presented in table 4 provide savings for a range of take up levels.

4.3 Children's future use of energy (i.e. their use of energy as adults)

Between now and 2025 4.7 million children will pass through the formal school education system – equating to 7.1 per cent of the population in 2025. The figures for 2050 are 20.8 million and 30 per cent respectively. This represents a significant proportion of the population in 2050. If educating these children about energy and climate and their role in tackling it played a key role in them being better behaved energy consumers as adults the impacts could be considerable.

However, as noted earlier, driving behavioural change is hugely complex, and attributing causality to one particular programme is fraught with difficulty. So, while it is possible to say with some certainty that education can contribute to the essential foundations for delivering long term behaviour change it is impossible to quantify with any certainty what

Table 4: Potential household carbon savings

% of households with school age children	Estimated number of households (millions)	Potential savings			
		Potential annual energy bill savings (m£/yr)	Potential lifetime energy bill savings (£m)	MtC/yr	Lifetime carbon (MtC)
25	7.70	102	870	2.1	29
50	5.80	205	1,700	4.2	58
75	3.80	307	2,600	6.4	87
100	1.90	410	3,500	8.5	120

⁷⁶ <http://www.statistics.gov.uk/STATBASE/Expodata/Spreadsheets/D7679.xls>

contribution education could make in terms of carbon savings in the long term.

It is however important to emphasise that simply because it is not possible to attribute direct carbon figures to these activities it does not mean they will not play an important role in delivering behaviour change and subsequent carbon savings. This lack of direct data should not be used as a reason not to support activity/intervention in this area. Rather it should be accepted that because it is very difficult if not impossible to attribute carbon savings to such programmes they should not necessarily be set up with 'hard' carbon targets to deliver.

4.4 Energy use in the wider community

Given the lack available evidence about the extent to which it is possible to deliver community wide energy-related activities it is not feasible to produce meaningful estimates of potential carbon savings at this stage.



Part 5: The Energy Saving Trust's Recommendations

5.1 Recommendations

If the UK is to meet its challenging climate change targets millions of consumers will need to change their energy-related behaviour. A range of additional policy instruments will be required to deliver this. The research outlined in this report suggests that while education alone is unlikely to be sufficient to bring about pro-environmental behaviours it has the potential to put in place the necessary foundations for delivering behaviour change. It is however important to highlight that we do not believe it is appropriate to place the full responsibility for tackling climate change with children.

Given the significance of climate change it is important that education and schools' ability to contribute to tackling it is optimised. In order for this to happen we believe that the following actions are required:

Policy

- **Climate change, energy, and energy efficiency policy.** Our research shows that education and schools have a role to play in delivering energy-related behaviour change and thus a role in helping to meet the UK's climate change targets. It is therefore important that UK climate change, and energy policy recognises this role. As such we recommend that this is recognised in future policy revisions, and that the role of schools and education is fully recognised and explicitly considered within wider Government work on behaviour change.
- **Education policy.** Within education policy there is a need for greater recognition of, and priority given to, the role that education can play in delivering energy-related behaviour change. From a purely energy perspective we believe that in England it would be useful to prioritise energy within the framework and believe that energy should have its own 'doorway' within the framework for sustainable schools. Given transport's significant contribution to climate change we also believe it is important that the 'travel and traffic' doorway is adequately linked to the 'energy and water' doorway.
- **Guidance.** However, we recognise that many of the doorways could in fact lead to climate change and energy-related considerations and as such believe it might be more appropriate to treat climate change and energy as a common thread or integrating element between the doorways. Teachers should be provided with sufficient guidance to do this.
- **Government cross-departmental and interdepartmental links.** If schools are to play a role in delivering energy-related behaviour change it is important that cross-departmental and inter-departmental links are strengthened and that responsibilities for delivery and funding are clarified. This agenda touches on a range of issues, including the sustainable schools framework, the curriculum, behavioural change/climate change, buildings/microgeneration, and communities, as such, for England, is relevant to the following departments, DCSF, Defra, CLG and DBERR.

- **Raising young people's awareness.**

Children are considerable users of energy consuming equipment. As such consideration by Government and the Energy Saving Trust should be given to the whether national awareness raising campaigns should have elements specifically aimed at young people, as already happens in other countries.

- **Integration of existing schools initiatives and sustainable schools.**

It is important that the sustainable schools agenda is not seen as competing with other schools related agendas in particular the delivery of ECM. We therefore support the recent work undertaken by the Sustainable Development Commission (SDC) which demonstrates that environmental wellbeing is a critical factor in children's overall wellbeing, and their conclusion that the environment provides 'a powerful mode of delivery of ECM outcomes'. We would urge that the SDC's recommendations are taken forward. In this context we believe it might also be appropriate to revise ECM outcomes to include a statement about future wellbeing.

Support

- **Access to external resources.** The research suggests that much of the existing energy related education is delivered by external bodies and that many teachers do not have a full understanding of the concept of sustainability and how to implement it. Until all teachers are adequately trained and confident to teach about climate change and sustainable energy there is a need to ensure that they have a) access to external resources

which should include access to trained professionals who are able to deliver relevant lessons, and b) access to additional support and guidance to help them identify the most appropriate and robust resources. This could be achieved through the systematic support of agencies undertaking sustainable energy activity in schools, and exploring how these could be better linked to existing widespread and well known initiatives such as EcoSchools. We believe that local authorities have an important role to play here as a link between schools and wider support services which could include 'in house' sustainability experts.

- **Schools leading by example.** It is important that action to improve the energy performance of the school and its grounds is undertaken before or alongside teaching children about sustainable energy. Teaching without the associated action could serve to undermine education about the importance of sustainable energy. We therefore believe that the energy performance of school buildings should be considered within relevant local authority indicators, and sufficient resources should be made available to schools to improve their energy performance.

- **Access to clear, independent information.** In this context there is also a need to ensure that schools have access to independent and clear information on the role of consumer behaviour change in tackling climate change.

- **Teaching throughout young people's school careers.** There is a need to ensure that young people are taught about the

sustainable use of energy in a coherent and holistic/whole school way throughout their school careers. We note that there appears to be a particular gap in provision for 14 to 19 year olds.

Research

- **Monitoring and evaluation.** There is a need for Government to adequately monitor and evaluate on an ongoing basis the impact of the sustainable schools agenda. This should include adequate monitoring of energy-related behavioural impacts – of pupils, parents, and the wider community, and make use of information gathered in the SEF and the s3 form.
- **The impact of schools on the behaviours of the wider community.** Linked to the above point we believe that further work should be undertaken to explore the impact of schools on the behaviours of the wider community. At the simplest level this could explore the impact that visible changes to the school building have on the behaviours of the wider public. In the short term it might be appropriate to gather evidence at a case study level from schools at the forefront of this agenda. In addition it would be useful to undertake work to explore in greater detail, and with larger sample sizes the impact that children have on household energy-related behaviour.
- **The extent to which climate change is being taught in schools.** There is a need to determine the extent to which schools are already teaching sustainable energy and what resources are currently used when teaching sustainable energy (e.g. do they adequately cover household energy efficiency? etc). It is important that all children are taught about climate change and the role they can play in tackling it. Without a sense of the extent to which climate change is being taught in schools it is impossible to determine the precise level of support and guidance needed to ensure widespread, consistent and holistic coverage of this subject.
- **What resources would schools find useful?** There is a need to undertake further work to identify the type of resources that schools would find useful in delivering energy and climate change education and the gaps that schools perceive there to be.
- **Good practice.** There exists much good practice in relation to teaching young people about sustainable energy. Work should be undertaken to collate good practice, and to ensure this is disseminated to practitioners.
- **Clarity of materials.** There is a need to ensure that materials on climate change and the role of individuals in tackling it are clear and easily understandable. Further work is required to determine why so many pupils find current resources confusing.
- **Longitudinal studies.** Given the inherent difficulties associated with undertaking longitudinal studies (e.g. expense, attributing causality etc) it is difficult to recommend that future energy-related initiatives include an element of longitudinal research to explore future impacts on behaviour. However, where ongoing social longitudinal studies are undertaken, for example the forthcoming UK Longitudinal Household Study⁷⁷ which includes a section on attitudes and

⁷⁷ <http://iser.essex.ac.uk/ukhls/consult1/meetings/>

behaviours related to environmental issues, we believe that consideration should be given to the incorporation of questions which might provide indicative evidence about the role that education has played in delivering specific behavioural changes.

- **School travel planning.** As noted earlier this report did not consider the wider impacts that school travel planning could have on behaviour. We believe that this remains a research gap. In addition, we believe that research should be undertaken to determine the extent to which travel plan initiatives make links with the curriculum.

- **Evaluation of behavioural outcomes.**

We recommend that future energy-related initiatives give greater consideration to, and direct greater resources at, the evaluation of behavioural outcomes.

- **Children and household energy use.**

Further research should be undertaken to explore the role of children in determining overall household energy use, the family dynamics that surround this and the impact that other factors have on family energy use (for example house and household size) and the interaction between these factors. This should include exploration of children's behaviour in relation to the energy using products they own. This work would also be useful in the context of Defra's work on Personal Carbon Trading.

Appendix 1: Brief summary of schools related programmes in EnR member countries

Country	Lead organisation	Schools related programme in place?	Brief Summary	Evaluated results available?
Austria	Klimabundnis Österreich	Bonus für alle: Energiesparen macht Schule (see: http://www.klimabundnis.at/root/start.asp?showmenu=yes&fr=&b=106&ID=988)	The focus of this programme was reducing energy use in the school building itself, and involved 36 schools. However, it included the provision of lessons on climate protection to students together with promoting their involvement in reducing the energy use of the school building itself.	None available at time of writing/none provided
Bulgaria	No relevant programmes in place			
Croatia	EIPH (Energy Institute Hrvoje Pozar)	Programme in place but no name provided	<p>This programme stemmed from the results of a survey which showed that Croatian citizens were not well informed about energy issues. As such it was originally envisaged that this programme would form part of a wider, ongoing public awareness programme.</p> <p>The programme involved the creation of two resources for schools – a brochure, and a board game. 3,000 copies of the brochure and 30,000 copies of the board game were produced and distributed to schools.</p>	None available at time of writing/none provided
Denmark	No response received			
Finland	No response received			
France	No response received			
Germany	No response received			
Greece	CRES (Centre for Renewable Energy Sources)	The Open Doors Programme	CRES has a number of permanent educational/promotional activities including an educational programme that CRES has developed for school children to visit the CRES premises. Each year approximately 3,000 pupils/students visit the premises and associated laboratories each year.	None available at time of writing/none provided
Ireland	Sustainable Energy Ireland (SEI)	A range of resources for primary and secondary schools (see: http://www.sei.ie/index.asp?locID=13&docID=-1)	<p>SEI provide a number of resources for pupils/teachers:</p> <ul style="list-style-type: none"> • a dedicated website for primary and secondary school teachers • provision of workshops for primary schools, and range of free resources including books, worksheets and posters • A website for secondary school pupils, and a range of free resources for schools. 	None available at time of writing/none provided
Italy	No response received			
Luxembourg	No response received			

Country	Lead organisation	Schools related programme in place?	Brief Summary	Evaluated results available?
Netherlands	Senter Novem	Energy Survival (see: http://www.energysurvival2006.nl/)	<p>The specific target of the programme is to stimulate energy efficiency among young parents by informing their children (aged 6 to 12 years old) and promoting energy efficiency as something that is 'cool' and relevant to talk about.</p> <p>The programme has two broad targets – 1) to get young families to reduce their energy use, and 2) to influence children in such a way as to ensure they are easier to influence on energy issues when they are adults.</p> <p>The programme is a cross-media one. It consists of:</p> <ul style="list-style-type: none"> • a TV show on national television • a website (see: http://www.energysurvival.nl/) • educational packages for primary schools (note: energy is not a required subject under the Dutch curriculum) • 'energy survival' events in municipalities 	None available at time of writing/none provided
Norway	Enova	Regnmakerne – "The Rainmakers" (see: http://www.regnmakerne.no/regnmakerne/skolen/)	<p>"The Rainmakers" is a national programme targeting children in school. The programme's activities include:</p> <ul style="list-style-type: none"> - Energy Monitoring in Schools in co-operation with the Norwegian Directorate for basic Education. Web-based. - Energy information and Education through national TV show, called Pysj Pop Baluba, targeting children (mini series, reports and feature stories, drama series, energy content on programmes web-site.) - Energy club for children. Marketed through several channels, but mainly through the website regnmakerne.no. - The Energy Challenge – a series in the reality TV genre with focus on energy efficiency and renewable energy. - Education material and background information on the energy subject on national website for educators in co-operation with the Norwegian Directorate for basic Education. - Annual National energy day – event with show and activities focusing on RES and RUE. TV coverage. - Annual Energy prize for the best scientific research in co-operation with The National Centre for Science Education 	None available at time of writing/none provided
Poland	No response received			

Country	Lead organisation	Schools related programme in place?	Brief Summary	Evaluated results available?
Portugal	ADENE	There are apparently a number of schools related programmes, including "Environment is for all – lets make better use of energy"	The main objective of the programme is to raise awareness amongst children (aged between 6/7 and 15) about energy issues. The programme involved the development of a range of materials for schools, including an animated movie – adapted from an existing French one, brochures, leaflets and a website were developed for schools. These were mailed to 150 schools across Portugal who were also invited to tender for funds to install energy efficiency and renewable technologies in their buildings. As a result four schools across Portugal were granted funding to the value of between €10,000 and €35,000. These schools were then contacted by ADENE who manage these funds and determine the most appropriate technologies for each school.	None available at time of writing/none provided
Slovakia	No response received			
Slovenia	No response received			
Spain	IDEA	SOLARÍZATE (see: http://www.solarizate.org/)	To promote a large scale use of solar energy and at the same time to increase the awareness among youngsters of the benefits of using this renewable energy. It involves the installation of solar photovoltaic panels in 52 Spanish public schools and for the elaboration of pedagogic material for teachers and pupils (manual for teachers, material for pupils, lab practices, guided tours, etc.).	None available at time of writing/none provided
Sweden	No response received			

Appendix 2: Methodological notes on the selection of behavioural areas

At the project briefing meeting on 28th September 2006, Elaine Waterson and Andrew Darnton agreed that the study should concentrate on no more than six behavioural areas.

A number of general criteria were applied to determine which areas should be selected for the study, these included:

- The likely availability of evidence (both that evaluations existed, and they would be in the public domain)
- The existence of sufficient education and awareness-raising activities involving young people
- The inclusion of behavioural goals (at least in part, and ideally long-term goals)
- The potential transferability of any lessons and principles to energy-related initiatives

Behavioural Areas

1. Energy-Related Behaviour
2. Environmental Citizenship (and Citizenship Curriculum)
3. Healthy Eating
4. Fairtrade
5. Littering
6. Road Safety

1. Energy related behaviours

Given that the ultimate aim of this work is to look at the potential impact of education/awareness raising programmes on energy-related behaviours any available evidence that is available from this sector will be particularly valuable.

2. Environmental Citizenship (and Citizenship Curriculum)

The brief highlighted the importance of giving consideration to a range of activities directed at children including subjects taught within the national curriculum that aim to deliver changes in long term attitudes and behaviour. Citizenship education ticks both boxes – to varying extents, it aims to deliver changes in both long term attitudes and behaviours. Its inclusion in the study also allows an exploration of the tensions between ‘learning’ and ‘doing’ goals in the current debate around Environmental Education. Citizenship is a requirement of the National Curriculum at least until 2008. The Government’s decision to continue with this requirement beyond that point will in part depend on the extent to which Citizenship can be proven to have created ‘better citizens’.

3. Healthy Eating

Activities focussed on encouraging healthy eating amongst school children have been running for a considerable number of years – such activities have been relatively high profile and considerable funds have been spent [need to confirm], as such it is likely that some evaluation of the long term impacts of such programmes will have been undertaken.

4. Fairtrade

As noted in point 2 above the brief highlighted the importance of giving consideration to a range of activities directed at children, spanning both formal and informal settings. Fairtrade has been a curricular issue for a number of years, while there has also been considerable out-of-school learning activity for young people centring on fairtrade chocolate (thus this area incorporates both learning and behavioural goals). In addition, it is envisaged that there is a lot of existing information in this

area. Finally, the overlaps between the sustainability (e.g. energy efficiency) and global poverty (e.g. fairtrade) agendas for change are becoming increasingly apparent.

5. Littering

Anti-litter campaigns directed at children have been running for a considerable number of years and as such there is a good chance that long term data might be available. In addition, littering/not littering is a 'minor' behaviour in much the same way as 'turning off the lights when you leave a room' and as such the impacts of such campaigns are likely to be particularly pertinent to energy-related behaviour change (minor changes to common routines).

6. Road Safety

This was the last area to be added to the list, and there was some doubt about the value of its inclusion. For instance, one concern related to road safety education prioritising short-term behavioural goals (i.e. focusing on cutting accident numbers). However, as with littering (and to some extent healthy eating) such campaigns have been running for a number of years and as such there is a good chance that some evaluation may have been done on long term impacts.

Other areas were considered, and placed on a 'reserve' list. During the data gathering phase, those individuals contacted would be invited to provide evidence relating to these 'reserve' areas if they felt it was particularly relevant to the wider debate on long-term behaviour change. Thus the scope of the study was left somewhat open, at least until all the evidence gathered would be reviewed at the half-way stage of the project (at the interim debrief).

The reserve areas were as follows:

- **Water use** – rejected because it was felt that there had not been significant levels of

educational activity in this area and as such the chances that any evaluation on long term behaviour had been undertaken were slim.

- **Drug Use** – rejected because it was felt that evidence in this area, which is known to be plentiful, would not provide learnings that were readily transferable to energy-related behaviours. Andrew Darnton has written on adolescent drug use (for FRANK at the Home Office, 2005); his paper takes the view that 'risk behaviours' such as drug use are shaped by peer dynamics, and subsequently habits based on pleasure. Furthermore, drugs education aims at preventing usage behaviours, and as such does not offer a useful model for energy-related interventions, which tend to try to encourage a more sustainable kind of energy usage.
- **Smoking and Drinking** – regarded as 'risk behaviours' among young people (along with unsafe sex) and rejected on similar grounds to drug use, as above.
- **Personal finance** – rejected because educational activity tends to focus on financial literacy (more of a skill than a behaviour), and also to have a significant marketing element (e.g. Schools Banks).
- **Personal hygiene** – although it has a long heritage in schools (linked to the PSHE curriculum), personal hygiene education activities tend to be designed by private-sector organisations. This observation led to the rejection of this area, because existing programmes tend to prioritise changes in brand behaviour (i.e. product purchasing) alongside good hygiene. Being commercially-backed activities, there were also doubts about being able to access any relevant evaluation studies that might have been undertaken.



Energy Saving Trust, 21 Dartmouth Street, London SW1H 9BP, Tel 0845 602 1425, www.energysavingtrust.org.uk
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