

Towards a Schools Carbon Management Plan

Evidence and assumptions informing consultation on a schools carbon management plan

June 2009



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Introduction

1. Background

DCSF's Sustainable Development Delivery Plan for schools includes a commitment to prepare a carbon management plan for the schools sector. The Department has asked the Sustainable Development Commission (SDC) to support the development of this plan, building on previous phases of joint working on carbon management and wider sustainable development issues in the sector.

The SDC has developed this document for DCSF in conjunction with a number of policy teams within DCSF and external stakeholders. It builds on previous work to develop a carbon footprint for the English schools estate¹ and an overarching strategic view of the emissions reductions that might be achieved².

2. About this document

The focus of the carbon management plan is **central government policy and its enabling effect on regional and local action to reduce schools greenhouse gas emissions.**

This document focuses on greenhouse gas emissions reduction without detailed consideration or costing of the policies that are identified. The inclusion of policies within the document does not constitute a commitment to implement or fund them.

Whilst we have considered action across the schools carbon footprint, we have given particular priority to school travel and transport, schools procurement and energy use in existing school buildings. Work on reducing emissions from new

school buildings is being managed by the Zero Carbon Schools Task Force.

The aim of the carbon management plan is to **identify the first decade of the path to 80% reductions by 2050**, that is, the policy framework and delivery options that will deliver significant greenhouse gas reductions by 2020.

This document consists of six sections:

- Section A: Carbon emissions from schools in England – an overview
- Section B: A carbon target for the schools sector in England
- Section C: Reducing emissions from energy use in school buildings
- Section D: Reducing emissions from school travel and transport
- Section E: Reducing emissions from school procurement and waste
- Section F: Implementation and delivery

¹ Schools carbon footprinting – scoping study, SDC, 2006, http://www.sd-commission.org.uk/publications/downloads/SDC_Carbon_Footprint_report_to_DfES.pdf

² Carbon emissions from schools: where they arise and how to reduce them, SDC, 2008, http://www.sd-commission.org.uk/publications/downloads/Publish_Schools_Carbon_Strategy.pdf

Definitions and scope

A **carbon footprint** is most commonly defined as the **total set of GHG (greenhouse gas) emissions** caused directly and indirectly by an individual, organisation, event or product (Carbon Trust 2008).

It is labelled a carbon footprint as commonly the total GHG emissions are converted to **CO₂ equivalent (CO₂e) emissions**.

This report addresses greenhouses gases and all figures are expressed as tonnes of CO₂ equivalent.

Other carbon management plans focus purely on reducing emissions of carbon dioxide, as these account for some 85% of greenhouse gas emissions. We have chosen to look across all greenhouse gases to ensure we take account of all possible opportunities for reductions.

Different footprinting models include different sources of greenhouse gas emissions in their scope. The GHG protocol is a widely used definition:

- Scope 1 – emissions from burning fossil fuels (building energy use - gas, coal, oil etc.) including fuels from vehicles owned by the organisation (petrol, diesel etc.) and chemical reactions. Sometimes this is referred to as the direct carbon footprint since this is directly under the control of the organisation (emissions **on**-site and by company's own vehicles)
- Scope 2 – emissions from purchased electricity used by the organisation (Purchased energy for own use, emissions **off** site)
- Scope 3 – emissions from other activities which the organisation can impact e.g. energy used in production of goods purchased by the organisation

Using this definition, this carbon management plan encompasses greenhouse gas emissions from **Scopes 1, 2 and 3**. This is consistent with previous phases of footprinting work for the schools sector carried out by the SDC and DCSF.

The figures contained within this report are the output of a schools carbon modelling tool developed by the Stockholm Environment Institute. They have been extracted directly from the model, without rounding or adjustment (see Annex A for an explanation of the model).

Section A: Carbon emissions from schools in England – an overview

1. Why do carbon emissions matter?

Climate change due to human activities is one of the most serious problems facing humanity in the 21st century. There should be no doubt over the science – the continued release of greenhouse gas emissions from the burning of fossil fuels, deforestation, and industrial and agricultural processes will lead to severe and potentially catastrophic changes in the earth’s climate, some of which will be irreversible.

2. The role of schools

The Government wants more schools to get engaged with sustainable development, and more deeply. Schools have the potential to become **beacons of good practice** for their communities and to inspire positive sustainable behaviours, not just through their teaching but through also their management and their engagement with local communities.

Schools can act as **hubs for learning and change towards sustainability in their communities** – for example, as the focal point of community-based energy systems or as demonstration

centres for recycling. Being seen to **lead by example** among the wider community is a means of building confidence in sustainable development, showcasing what can be achieved.

Schools cannot and should not be expected to deliver emissions reductions alone. There are actions to be taken across the schools system and at local, regional and central levels.

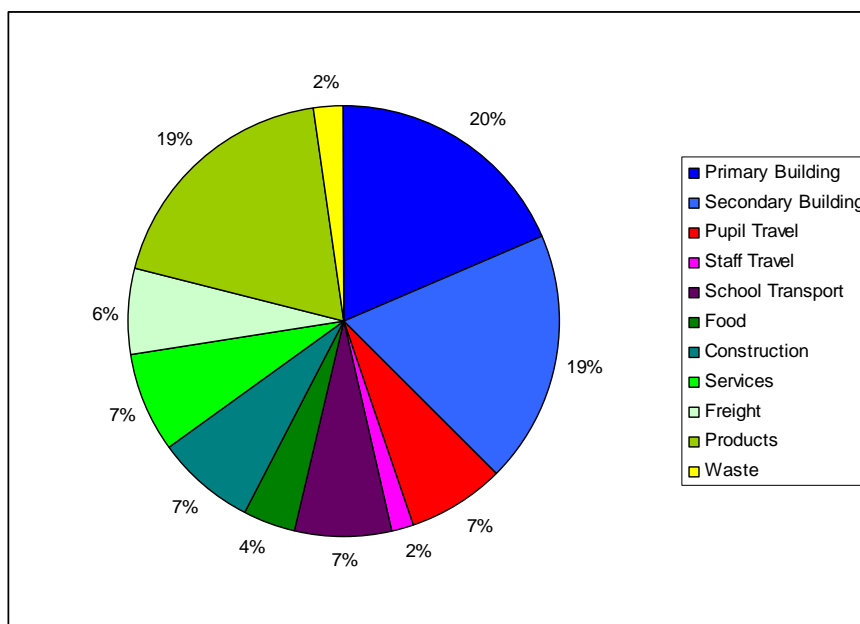
3. Schools carbon footprint

Greenhouse gas emissions are divided into four main sources:

- The use of energy in school buildings
- Pupil, staff and school travel and transport
- Supply chain activities of companies producing goods and services procured by schools
- Waste management and minimisation by schools

The Sustainable Development Commission’s carbon footprint for the English schools estate estimates that the sector emits **9.4 million tonnes of carbon dioxide equivalent each year**.

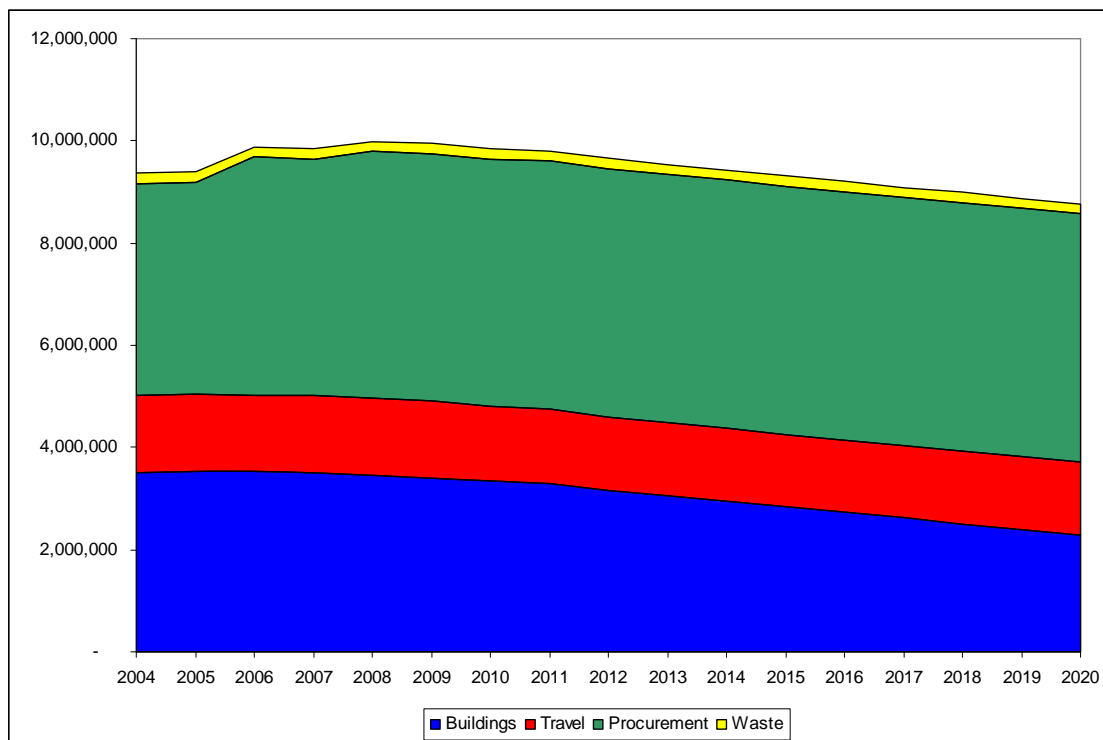
The chart below shows a more detailed sector breakdown of the schools carbon footprint:



Modelling suggests that emissions from the English schools estate will remain relatively constant through to 2050. Trends which are likely to increase emissions (for example, longer school opening hours) tend to be balanced out by trends which are likely to reduce emissions (for instance, improved energy efficiency). This is indicated by the chart below:³

Although the BAU trajectory does not suggest a strong growth in emissions, it is clear that **emissions are not on a path to reduce by at least 80% by 2050, in line with national targets.**

CO₂e emissions projected under a Business As Usual (BAU) scenario to 2050



³ Details of how the footprint and the Business As Usual trajectory were developed can be found in *Carbon emissions from schools: where they arise and how to reduce them*, SDC, 2008 (www.sd-commission.org.uk)

Section B: A carbon target for the schools sector in England

1. Context

The UK Climate Change Act requires an 80% reduction in greenhouse gas emissions by 2050 from 1990 levels. As part of the Budget 2009, the Government announced its intention to set the first three 'carbon budgets' – limits on the amount of greenhouse gases that can be emitted by the UK in a given five year period. These carbon budgets offer milestones and help to shape a proposed pathway for emissions reductions; the first three carbon budgets are expected to require the following cuts in greenhouse gas emissions across the UK as a whole:

- By 2012 – a 22% reduction from 1990 levels
- By 2017 – a 28% reduction from 1990 levels
- By 2022 – a 34% reduction from 1990 levels

The 34% target reflects the bottom end of the range recommended by the Committee on Climate Change⁴, which sought a 2020 target of either a 34% reduction (where no global emissions agreement was in place) or a 42% reduction (where a global framework is agreed).

UK targets are generally expressed against a 1990 baseline. At present, the school sector footprint exists for 2004 and 2001 only. To build consistency, DCSF is undertaking additional work to extend the schools carbon footprint to a 1990 starting point.

⁴ The Committee on Climate Change (CCC) is an independent body established under the Climate Change Act to advise the UK Government on setting carbon budgets, and to report to Parliament on the progress made in reducing greenhouse gas emissions.

2. Approach to setting targets

The approach to setting a carbon target for the English schools sector is based on two principles:

- Commitment to carbon reductions across the whole carbon footprint
- Leadership by example

2.1 Commitment across the footprint

DCSF has developed a carbon footprint which looks across all emissions related to schools (from energy, transport, procurement and waste). The Department is committed to taking action across the footprint.

The Department of Energy and Climate Change (DECC) recognises that the "whole footprint" approach makes a valuable contribution to meeting climate change targets and attaches importance to efforts to reduce procurement emissions in this way even if they do not appear in the national accounts or sector results.

2.2 Leadership by example

Government has stated its commitment for the public sector to lead by example in reducing carbon emissions.

Under the Energy Services Directive⁵, all public sector organisations – including schools – are required to implement cost effective energy efficiency measures through sustainable procurement. In practice, this means that equipment and vehicles purchased by schools must as a minimum conform to the energy efficient product specifications detailed in **Buy Sustainable – Quick Wins**. Public sector organisations must also show leadership to individuals and businesses by demonstrating and communicating their energy saving actions, and sharing best practice and information.

The landscape for action to reduce carbon emissions is changing, with the introduction of new carbon reduction performance indicators for

⁵ The EC Directive on Energy End Use Efficiency and Energy Services, see <http://www.defra.gov.uk/environment/climatechange/uk/energy/energyservices/>

local authorities and policies such as the Carbon Reduction Commitment (these are discussed in more detail in Section F – Implementation and delivery, part 3 - Local delivery).

3. Setting targets

Outlined below are three potential target options for DCSF.

These are expressed in terms of 2020 and 2050 targets for emissions reductions from a 2004 baseline (the most recent year for which a schools carbon footprint has been developed), and are designed to reflect different levels of ambition, both in the short and long term.

The minimum expectation outlined below is that the schools sector will deliver emissions reductions in line with national targets, whilst also demonstrating leadership (eg, through early achievement or through structured action across the whole footprint).

These targets have been developed using a bottom-up modelling approach where individual policy options are accumulated. These policy options are discussed in more depth in the following chapters.

For the schools sector, carbon budgets or targets over time have been split by sector to provide clear expectations for each policy area. The targets are expressed in such a way that it is clear to see the contribution of reductions from across the whole footprint. There need to be significant cuts in those areas where the pathway to reductions is best understood – particularly energy use in school buildings and school travel and transport. The route to reducing emissions from school procurement is less well understood. In addition, the trajectory for procurement emissions is expected to rise by 17% in the coming years. This compares with an anticipated fall in emissions elsewhere in the footprint. In light of this, the target we are proposing for reducing procurement related emissions is not as high as those for energy and travel. It is, however, challenging and, given the significance of procurement to the schools carbon footprint, essential.

Targets have been expressed against a 2004 baseline. However, to build consistency with UK national targets, further modelling is required to identify a 1990 baseline and to define targets against that starting point. It is important to note that this may mean cuts in emissions need to be even deeper than those outlined below.

Leadership

Definition: Exceeding national targets for greenhouse gas emissions reductions to 2020 and 2050, across the whole footprint, with significant early progress to 2020.

Focus:

- Early action to make deep cuts in energy and travel emissions to 2020
- A focus on “quick wins” in reducing procurement emissions to 2020, coupled with development work to influence procurement sectors which are less well developed.

By 2020

At least 42% reduction in CO₂e emissions by 2020 from a 2004 baseline

At least 55% off energy and 55% off school transport emissions by 2020 from 2004 baseline

At least 20% reduction in procurement emissions by 2020

By 2050

At least 90% reduction in emissions by 2050 from 2004 baseline

At least 90% off energy and school transport emissions by 2050 from 2004 baseline

At least 90% off procurement and school travel emissions by 2050 from 2004 baseline

Challenge

Definition: Exceeding national requirements for CO₂e reductions to 2020 and 2050, with wider spread of action over the period

Focus:

- Early action to make cuts in energy and travel emissions to 2020
- A focus on “quick wins” in reducing procurement emissions to 2020, coupled with development work to influence procurement sectors which are less well developed.

By 2020

At least 38% reduction in CO₂e emissions by 2020 from a 2004 baseline

At least 50% off energy and 55% off school transport emissions by 2020 from 2004 baseline

At least 20% reduction in procurement emissions by 2020 from 2004 baseline

By 2050

At least 85% reduction in emissions by 2050 from 2004 baseline

At least 85% off energy and school transport emissions by 2050 from 2004 baseline

At least 85% off procurement and school travel emissions by 2050 from 2004 baseline

Compliance

Definition: Delivery of minimum national requirements for CO₂e reductions to 2020 and 2050 compared to 1990 baseline, with particular emphasis on energy and travel emissions

Focus:

- Delivery of minimum national requirements for CO₂e reductions for energy emissions and travel emissions
- Wider activity in procurement emissions to influence reductions in wider sectors of economy.

By 2020

At least 34% off energy and school transport emissions by 2020 from 1990 baseline

Demonstration of influence in reducing school procurement emissions with no numeric target (to 2020)

By 2050

At least 80% off energy and school transport emissions by 2050 from 1990 baseline

Demonstrable leadership and influence in reducing school procurement emissions commensurate with an economy wide reduction in emissions of 80% from 1990 baseline

In the longer term, the way in which emissions reduction targets are defined and modelled may be modified through scientific research or development of new frameworks and it is important to remain mindful of how targets and definitions might evolve.

A discussion of how targets might be reviewed and how progress might be monitored is included in Section F, 6.1 – Data and monitoring.

This report goes on to model a potential Leadership pathway that has the aim of delivering at least a 42% reduction in carbon emissions by 2020.

4. A pathway to 2020

Modelling the targets and milestones above has helped to inform a potential pathway for emissions reductions to 2020 and 2050 for the schools sector.

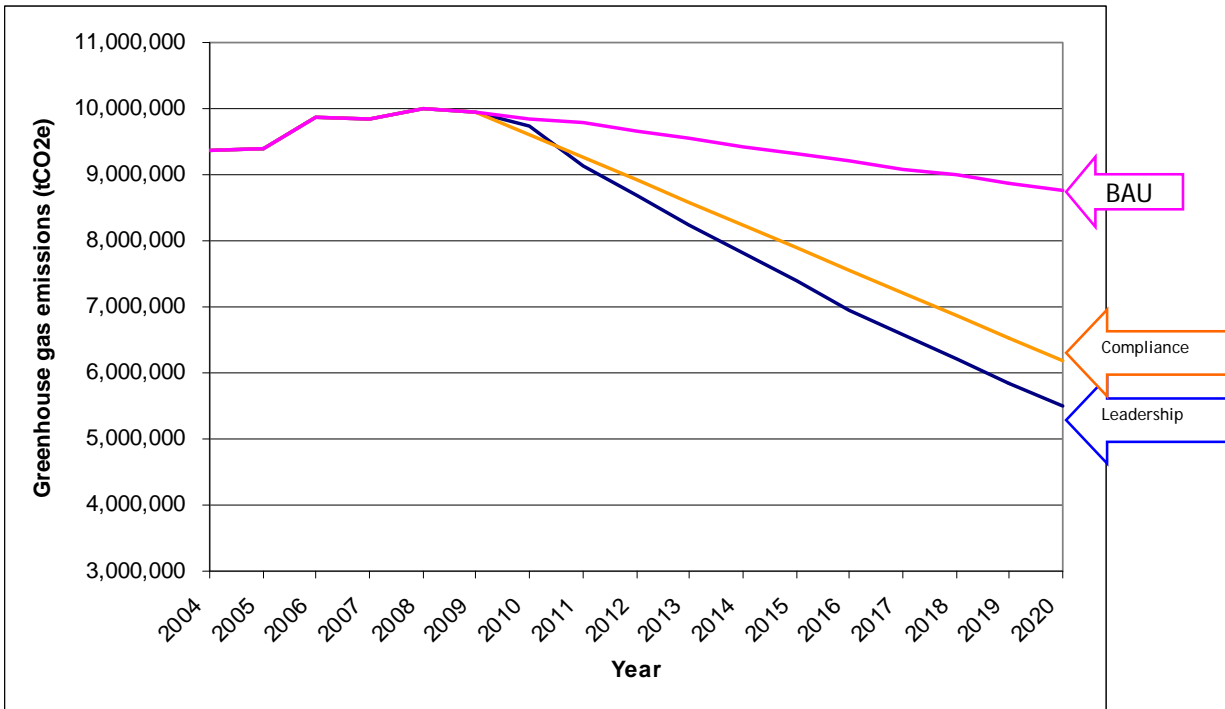
This pathway has been developed by modelling the assumed effect of a range of policy options across the whole footprint, taking into account likely carbon impact, relative cost and relative non-carbon benefits to the school/sector. A key principle driving the development of the pathway is the importance of early action to reduce emissions.

In addition, we have modelled actions across the whole footprint, bearing in mind that different policy areas will offer carbon reduction opportunities at different times (e.g. recognising that the carbon impacts of some procurement categories may not be fully understood at this time).

The chart below indicates three trajectories:

- **Leadership** - a pathway to a 42% reduction in overall CO₂e emissions by 2020 from a 2004 baseline
- **Compliance** – illustration of a 34% reduction in overall CO₂e emissions by 2020 from a 2004 baseline
- **Business As Usual (BAU)** – this trajectory was developed by the SDC in a previous project phase and shows a 6% reduction in CO₂e emissions by 2020.⁶

⁶ *Carbon emissions in schools: where they arise and how to reduce them*, SDC, 2008, www.sd-commission.org.uk



Exploring the Leadership trajectory in more detail, we see that it is made up as follows:

Emissions category	2004 baseline	2020 footprint	Percentage reduction
Energy	3,507,423 tCO ₂ e	1,422,222 tCO ₂ e	59%
Transport	1,510,670 tCO ₂ e	682,885 tCO ₂ e	55%
Procurement	4,341,023 tCO ₂ e	3,393,636 tCO ₂ e	22%
Totals	9,359,116 tCO₂e	5,598,054 tCO₂e	42%

The following sections of this document outline ways in which each part of the schools carbon footprint could be reduced.

Section C. Reducing emissions from energy use in school buildings

1. Context

Energy use in school buildings accounts for 37% of the schools greenhouse gas footprint, a total of 3,507,423 tonnes of carbon dioxide equivalent each year.

These emissions are fairly evenly split between primary and secondary schools, with primary schools responsible for 49% and secondary schools responsible for 51% of emissions.

Statistics from the DCSF⁷ suggest that building-related carbon emissions were relatively stable between 1990 and 2003. There has been a notable increase in emissions from electricity use over this period, which has been counterbalanced by a reduction in emissions from fossil fuels for space heating (because of improved energy efficiency).

Traditionally, around 75% of energy consumption in a typical existing school was for heating and hot water⁸. Around 10% of energy consumption was for lighting with ICT use represented only 2% of building energy consumption in 2002.

However, the picture is changing. Demand for electricity increased by 32% between 2000 and 2003, from a combination of increased use of ICT, greater demand for cooling and greater demand for lighting. Improved energy efficiency and more efficient heating systems mean that, for new schools, only around 30% of energy consumption is for heating and hot water.

⁷ DCSF, *Energy and Water Benchmarks 2003-2*, 2004 <http://www.dfes.gov.uk/rsgateway/DB/SBU/b000477/index.shtml>

⁸ Faber Maunsell/AECOM for DCSF, *The Use of Renewable Energy in School Buildings*, 2007, sourced from Carbon Trust GPG 343 *Introduction to Energy Efficiency in Schools*

The latest energy benchmarks⁹ indicate that for emissions from energy use in school buildings:

- An upper quartile secondary school of 10,000m² emits around 400tCO₂ per year from its energy use (the specifications for Academies or BSF schools require achievement of upper quartile performance).
- A lower quartile secondary school of 10,000m² emits around 630tCO₂ per year.
- An upper quartile primary school of 3,500m² will emit around 140tCO₂ each year. A primary school improved under the Primary Capital Programme will emit 110-150tCO₂ per year.
- A lower quartile primary school of 3,500m² emits around 220tCO₂ per year.

2. Commentary

The Business As Usual trajectory indicates that emissions from energy use in school buildings will fall by 35% in the period to 2020. This is largely due to the impact of Building Schools for the Future and the Primary Capital Programme on improving the energy performance of the building stock (it is important to note that construction and refurbishment activity carry their own significant carbon emissions; these are explored in more detail in Section E – Reducing emissions from school procurement).

Our modelling is based on the assumption that BSF and PCP will achieve their energy performance objectives; however, this relies on **significant and consistent improvements in school building design, construction and operation**, and we address these issues below.

There is also a need to ensure that we have **robust and useful data** about energy use from across the schools estate. Historically, data was gathered based on spend on energy bills, but fluctuations in the price of energy can skew information; consumption data (which is provided

⁹ DCSF, *Energy and Water Benchmarks for Maintained Schools in England 2002-3*, 2004, <http://www.dfes.gov.uk/rsgateway/DB/SFR/s000449/SFREandW2602-web.pdf>

on energy bills or through smart meters) is required if we are to gain a true picture of the sector. Robust data is crucial to monitoring the effects of policies and initiatives, learning from experience and mainstreaming successful approaches.

We are missing an opportunity, however, if we do not work to encourage **energy demand reduction** by prioritising energy efficiency and behaviour change across all aspects of school operations. Many schools have implemented energy saving projects, but take up is not consistent across the country; nor is it necessarily continual as school years change and priorities are adjusted. Furthermore, energy saving behaviours acquired at primary school do not necessarily make the transition to secondary school (this can apply as much to staff behaviour as to pupil behaviour).

Schools could be acting as **beacons for sustainability** in their communities, with the use of low carbon and renewable energy

technologies in schools helping to raise awareness and drive change amongst the wider population.

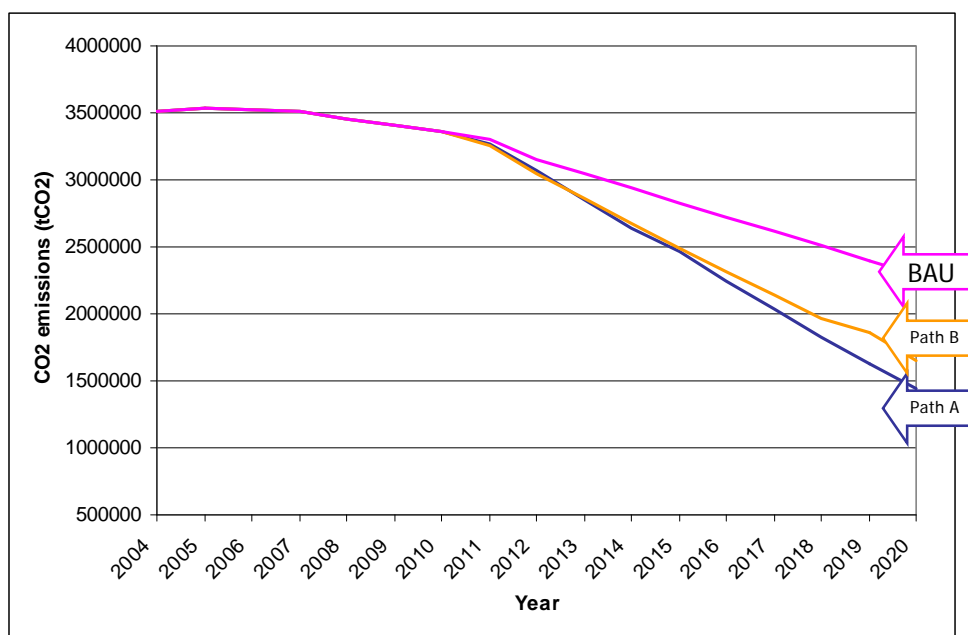
3. Expected outcome of interventions

The package of interventions outlined below is aimed at reducing carbon emissions from energy use in school buildings. It contains some core elements (see Strategic Framework below) and offers two paths for policy development.

The Business As Usual trajectory recognises a 35% reduction in emissions to 2020. The two policy packages identify the following savings:

- Path A – 59.3% total carbon saving (additional 24.3% over BAU)
- Path B – 53.7% total carbon saving (additional 18.7% over BAU)

This is indicated in the chart below:



4. Package of interventions

4.1 Strategic framework

4.1.1 Carbon standards for new and existing schools

Existing capital programmes already require improvements in energy performance compared to 2002 Building Regulations. The Department has an ambition for new school buildings to be zero carbon from 2016. A pathway needs to be established from the current energy requirements to zero carbon, much as the Code for Sustainable Homes provides a path to zero carbon homes by 2016. The current target of 27kgCO₂/m² for new schools within BSF has reduced from a previous target of around 40kgCO₂/m² during the early waves.

This is a more straightforward task for new schools than for existing schools; however, existing schools are responsible for the vast

majority of energy use and carbon emissions and a structured framework needs to be in place to drive their improvement.

The average emissions from existing school buildings are around 52kgCO₂/m² (although this figure will vary from site to site) and it is estimated that, overall, this can be cost-effectively reduced by a little over 20%. This suggests that average emissions could be reduced to around 40kgCO₂/m² through refurbishment or retrofit with currently viable solutions. However, we do not yet know what levels can be practically achieved with currently available technologies and practices.

A series of carbon emissions standards would help to guide design and delivery of new and refurbished school buildings on a path to zero carbon, for example:

Carbon standards for primary schools

	2010-12	2013-15	2016-24
New Build within PCP	40kgCO ₂ /m ²	10kgCO ₂ /m ²	0kgCO ₂ /m ²
Refurbishment within PCP	40kgCO ₂ /m ²	20kgCO ₂ /m ²	10kgCO ₂ /m ²
Refurbishment of schools not within PCP			10kgCO ₂ /m ²

Carbon standards for secondary schools

	2010-12	2013-15	2016 onwards
New Build within BSF	40kgCO ₂ /m ²	10kgCO ₂ /m ²	0kgCO ₂ /m ²
Refurbishment within BSF	40kgCO ₂ /m ²	20kgCO ₂ /m ²	10kgCO ₂ /m ²

BSF and PCP are the major vehicles for delivery of new build and refurbishment measures. Specifications within BSF and PCP could be strengthened to ensure with the minimum of doubt that the above trajectory for carbon standards will be met for both new build and refurbishment projects. Energy and carbon KPIs and performance management tools used within BSF to assess programme and project performance could be strengthened and

extended to other parts of the Department's capital programme.

Carbon reduction should also be made a requirement of ongoing maintenance and facilities management contracts, placing the onus on the management company to seek continuous opportunities for improvements. This type of approach must become the norm to ensure that

building energy emissions follow the desired trajectory.

It is important to note that these are not just design standards, but that measures are put in place to ensure that they are achieved once buildings are occupied. If our schools do not achieve these standards once built then significant carbon emissions reduction opportunities will be lost.

DCSF Schools Capital team have commissioned research during 2009 to identify the potential for carbon emissions reductions from retrofit and refurbishment measures across a variety of school types and ages. This will help determine the carbon standards which are achievable with currently understood technologies and practices.

Impact/outcome

Trajectories for both new build and refurbishment would provide the construction supply chain with clarity about what is expected of them in the medium-long term and encourage investment in the measures and technologies required.

The 2004 carbon footprinting exercise, and the development of the Business As Usual trajectory, were conducted prior to the Department's commitment to achieve zero carbon new school buildings from 2016. Modelling now suggests that the commitment to zero carbon new build from 2016 will deliver **18,453 tCO₂e** savings to 2020.

Applying an interim new build standard between 2013 and 2015 would deliver a saving of **4,963 tCO₂e**.

Applying the standards outlined above to the refurbishment work being undertaken in Building Schools for the Future and the Primary Capital Programme would have a significant impact on carbon emissions, delivering a saving of **352,210 tCO₂e** to 2020. This demonstrates the fundamental importance of addressing carbon emissions as we refurbish our less efficient building stock as well as creating low carbon new schools.

4.1.2 Ensuring energy performance standards are achieved

Many of our new and refurbished schools do not achieve the levels of energy performance expected from their design. Consistent post occupancy evaluation would enable the industry to learn what works and what can be improved, as well as providing a contractual way of securing improvements once a school has been completed. Post occupancy evaluation is particularly critical in the secondary sector, where BSF schools are now being delivered and where the impact of not meeting standards will be significant. Post-occupancy evaluation should be initiated as soon as possible within the BSF and PCP contract processes.

Post-occupancy evaluation that specifically evaluates energy use will help to identify what can be improved when designing and building the next school; it is not enough on its own, however. Lessons from post occupancy evaluation need to inform action on skills and capacity, in building design, construction and building management.

Effective training programmes for school occupants, facilities managers, caretakers, ICT technicians and support staff would help improve day to day control over buildings, and a much more consistent process of handover needs to take place when users start occupying a new or refurbished building. Failure to provide an adequate handover should incur a penalty through procurement contracts. DCSF and the National College for School Leadership are working together to help BSF schools prepare for zero carbon building design and this support could be expanded to all schools going through major refurbishment.

A major cultural shift is implied here, as significant as any of the technical hurdles we need to overcome. It is very difficult for building designers, contractors and users to acknowledge that they have made mistakes (particularly where there may be professional liability implications), but capital programmes provide a "once in a lifetime" opportunity for low carbon transformation and must be delivered effectively if we are to meet our carbon reduction goals.

The Zero Carbon Schools Task Force¹⁰ identified and discussed many of these issues, and a priority for future action should be the development of a strategy and some delivery models which will help overcome these challenges at the earliest opportunity.

Impact/outcome

These activities are essential if we are to achieve the carbon savings available from major capital programmes that are assumed in the Business As Usual trajectory.

4.1.3 Data and monitoring

The Zero Carbon Schools Task Force is exploring the benefits of smart meters to enable school building managers to gain access to much more accurate, real-time data about energy use, and could be linked to curriculum work for pupils.

Display Energy Certificates also provide valuable data about school energy performance, tracking schools' actual use of energy year on year. Data from Display Energy Certificates can be used to inform targeting of measures and to identify shared procurement needs across multiple schools (for example, several schools in a local authority area may require lighting control upgrades, enabling a collaborative approach to procurement and potentially driving down unit price).

Whilst much of this data would be gathered and used at local (school, local authority) level, it will also be valuable to DCSF in monitoring progress against the carbon reduction trajectory. It is also notable that ICT has a positive role to play in helping address data and monitoring.

Impact/outcome

If smart meters are rolled out to all schools evenly between 2011 and 2020, and each school achieves, on average, a 5% reduction in building

¹⁰ In The Children's Plan, DCSF recognised that its school building programmes must support the government's aims to reduce carbon emissions, and set out an ambition that all new school buildings will be zero carbon (for energy emissions) by 2016. The Zero-Carbon Task Force has been established to advise on how this ambition can be met.

energy emissions, then a total carbon emissions reduction of **64,198 tCO₂e** could be achieved.

4.1.4 Advice and support

There are two Government agencies specifically supporting emissions reductions related to energy: the Carbon Trust, which works with business and the public sector, and the Energy Saving Trust, which works with communities and householders. The Carbon Trust has recently launched a communications campaign targeting schools and promoting energy surveys, audits and support. The work of the Pan Government Energy Project may also be helpful in identifying advice and support opportunities for the schools sector.¹¹

Schools and local authorities can also benefit from on-the-ground local support to address energy saving in schools, whether that's through behaviour change, better energy management or installation of measures.

The Energy Saving Trust has a network of regional Advice Centres operating across the country, working with local authorities, communities and householders. This infrastructure could offer a cost-effective way of bringing skilled energy advisors and project managers into contact with schools to develop local projects and initiatives. This could shift the burden of taking action from school heads or teachers onto a network of specialists who will have a much shallower learning curve and who can bring in specific skills as required. A similar model was deployed by the Energy Saving Trust in providing a support service to local authorities; this became one of the most cost effective carbon reduction programmes in their portfolio.

4.1.5 Funding

Path A (below) models a range of policies including refurbishing or rebuilding all of the primary schools not currently included in the Primary Capital Programme.

¹¹ The Pan Government Energy Project brings together public sector energy buyers to identify ways of working collaboratively on energy procurement.

Path B models a suite of policies which includes smaller, more targeted refurbishment programmes, rather than a wholesale approach.

Both scenarios are likely to require significant capital funding and a number of routes could be explored to identify and make use of existing resources:

- Widespread use of Salix funding by schools, most likely mediated by local authorities (and with a dedicated schools stream established). Salix offers match funding to organisation's own resource which is held in a ring-fenced fund. This fund is used to finance energy efficiency projects, with savings from energy bills being recycled into the fund to support future projects.
- Engagement with the energy suppliers and ICT suppliers and service providers – for example through a voluntary commitment to supply affordable renewable energy systems to schools, or through prioritising and / or subsidising the roll out of smart meters to schools.
- Encouragement of energy services models

through engagement with contracting companies (particularly across local authorities)

- Use of Partnership for Renewables support / funding for on site renewable energy schemes where appropriate
- Supporting the uptake of available grant funding for low carbon and renewable energy technologies, and the use of feed-in tariffs and renewable heat incentives (when available)
- The Carbon Reduction Commitment, which will be launched in 2010, embraces schools within a carbon trading scheme (under the umbrella of their local authority). The CRC should trigger further action by local authorities to reduce the energy-related carbon emissions of schools in their areas.

Whilst these funding sources will provide some of the capital required for investment in low carbon and renewable energy in schools, DCSF may wish to keep the issue under review in the light of Government's growing carbon reduction commitments.

Case study - Energy services contracts

North Somerset secondary schools

Schools in North Somerset are partners in an innovative energy services and maintenance contract with their suppliers, Dalkia and EDF Energy.

This "Performance Partnership" contract combines utility supply via EDF Energy and energy reduction services through a planned and reactive maintenance programme, provided by Dalkia. This joined-up approach to energy management requires the schools to adopt a more strategic long-term approach to their energy requirements, but delivers effective risk management of energy costs in a volatile energy market. Long term costs were fixed within the terms of the contract, providing transparency and predictability for North Somerset Council and with the added benefit of a robust and simple billing process encompassing all services.

This required a step-change approach from not only North Somerset Council, but also the individual decision-makers at each of the 12 secondary schools involved. EDF Energy and Dalkia undertook separate presentations to School Heads, Governors and Business Managers to convince them of the financial and environmental benefits.

This is just the beginning of a much wider-ranging programme of Dalkia supported capital investment in new plant and energy-saving initiatives, designed to bring even greater returns for the secondary schools in the authority. Each school will be surveyed and a tailored business plan developed for a future capital programme to ensure long-term carbon reductions and financial savings.

5. Initiatives/policies

We have modelled two potential paths to large scale carbon emissions reductions to 2020; the first relies on a wholesale refurbishment and rebuilding of primary schools. The second adopts a more “piecemeal” approach, offering a number of targeted interventions to achieve a similar outcome.

5.1 Path A

5.1.1 Primary school refurbishment and rebuilding

The Primary Capital Programme is a 15-year, £7 billion capital investment programme which aims to modernise half of the primary school building stock.

Modelling suggests that refurbishing or rebuilding all of the **remaining** primary school buildings, from 2013 and to the carbon standards outlined above, would deliver significant carbon emissions reductions.

Such a programme is not easily undertaken. It will place demands on and provide opportunities for local authorities, the construction industry and schools themselves. It will also have a significant impact on carbon emissions associated with the construction sector (see Section E – Reducing emissions from school procurement). That said, the learning effects for the construction industry could offer great benefits to the wider UK building stock in years to come.

Impact/outcome

We calculate that an expanded programme of refurbishment and rebuild of primary schools could deliver a reduction of **270,545 tCO₂e to 2020**.

5.1.2 Behavioural change programmes

Schools can already benefit from many regional and local awareness raising campaigns regarding behavioural change in the use of energy in buildings. The Zero Carbon Schools Task Force recommends that DCSF should launch an information and awareness raising programme designed to influence behaviour change and embed in schools a culture of energy and carbon awareness. A sustained national campaign, linking into regional and local support services, would help to bring consistency of messaging and clarity of action required.

Schools which have seen the results of behavioural change on energy use should be encouraged to share what they have achieved with others, so that effective models of behaviour change can be replicated. Where improvements have been sustained over a period of time, there may be opportunities for recognition or reward.

It may be appropriate, in some local circumstances, for energy management expertise to be shared across school sites and campuses. This could also apply to the sharing of ICT services and expertise. There is a need for guidance to show on how this might be encouraged, how it can be enabled by technologies such as smart meters and when it might be suitable.

Impact/outcome

We have assumed a 10% annual take up of behavioural change activities across secondary and primary schools, each year from 2010 to 2020. Average carbon savings from behavioural change are calculated at 10%.

This activity and level of take up would achieve carbon savings of **142,662 tCO₂e to 2020**.

Case study - Pupil-led behaviour change

Ringmer Community College, Lewes

Ringmer is a rural Community College near Lewes in East Sussex with 798 pupils from a variety of backgrounds and of mixed ability. Two hundred pupils have volunteered to be Eco Reps, to improve the environmental performance of the college, and to change the attitudes of teachers and pupils to environmental issues.

Pupils are involved in monitoring energy and waste around the school and regularly visit other schools, colleges and community groups to present their environmental work and encourage others to follow their example. Their work includes monitoring and reporting malfunctioning radiator valves, and managing a system of penalty charges aimed at those departments which leave lights and ICT equipment switched on. Eco Reps also “name and shame” those departments which perform badly on energy and paper use.

The college also shows its commitment to sustainable energy more obviously by the generation of electricity from a 2.5kW wind turbine and a 7.5kW solar photovoltaic (PV) array. A new Sixth Form teaching block, opened in September 2008, is heated by a ground source heat pump and incorporates passive ventilation, energy efficient lighting and controls. Pupils were actively involved in the design of this new building.

5.2 Path B

5.2.1 Behavioural change programmes

Behavioural change programmes are a cornerstone of our second pathway to reductions in emissions from energy use in schools buildings. Path B is consistent with Path A.

Impact/outcome

We have assumed a 10% annual take up of behavioural change activities across secondary and primary schools, each year from 2010 to 2020. Average carbon savings from behavioural change are calculated at 10%.

This activity and level of take up would achieve carbon savings of **142,662 tCO₂e to 2020**.

5.2.2 Minor refurbishment programmes

To accelerate the achievement of cost-effective carbon savings within primary school buildings, a minor refurbishment programme could be deployed from 2011 to 2020. This would apply to some of those schools which have not yet been addressed by the basic Primary Capital Programme. Minor refurbishment measures are designed as “quick wins” – low levels of investment paying back within five years which should be easily replicable across schools.

In addition, a short-term minor refurbishment scheme for secondary schools could target those schools that have not yet reached BSF investment.

Data to inform selection of schools (for both minor refurbishment programmes) could be derived from local authority data on energy consumption gathered for NI 185. Alternatively, data gathered from Display Energy Certificates could be used, with improvements targeted at the poorest performing schools.

Impact/outcome

If 500 primary schools benefit from minor refurbishment each year from 2011 to 2015, a carbon saving of **13,106 tCO₂e** would be achieved.

A secondary minor refurbishment programme, targeting 150 schools per year between 2011 and 2015 would deliver **19,175 tCO₂e** savings.

5.2.3 Renewable generation programmes

Large scale programmes to deploy appropriate renewable energy technologies within the schools estate have the potential to reduce carbon emissions, cut running costs to schools and raise awareness of sustainable energy and

climate change across the community. However, they currently carry significant cost barriers.

Local feasibility studies would need to be conducted to establish the most appropriate mix of technologies. These could potentially be delivered through a dedicated local resource (see Section F – Implementation and delivery). Local authorities would be in a position to undertake or commission feasibility studies in tandem with wider carbon reduction strategies being developed by in response to NI 185. (It is important to note that local authorities could choose focus on their own buildings – town halls, council offices etc – rather than deploying measures in schools.)

There are potentially opportunities for initiatives and policies based around individual low carbon and renewable energy technologies. Ideas include:

- Stimulating take up of biomass heating schemes for rural schools that are not connected to the gas grid
- Support for **schools currently using coal or oil** as heating fuel, in order that they can convert to biomass heating schemes (see Nottinghamshire County Council case study below)

- **Design support for new schools** to “PV-enable” them, so that solar PV technologies can be installed as they become more efficient and cost effective
- Support for **schools with swimming pools** where conversion to combined heat and power and/or solar water heating could deliver cost and carbon benefits
- Identification and support for schools that can act as the hub for **community energy schemes** using biomass boilers, CHP or other low carbon energy sources. Where dwellings are clustered around a school, there is an opportunity to match up the school’s daytime heating / electricity load with the homes’ evening requirements and establish the running hours which maximise the efficiency of CHP.
- Projects which use **waste heat from server rooms** to supplement heating or ventilation systems within school buildings.

Impact/outcome

A renewable energy retrofit programme, which aimed to see 50% of schools achieving a 20% reduction in emissions in the next ten years, could deliver **42,852 tCO₂e** by 2020.

Case study - Solar 4 Schools

Solarcentury / Scottish and Southern Energy

Solar 4 Schools is a joint project between Solarcentury, one of the UK’s largest solar installation companies, and Scottish and Southern Energy. The project helps schools to access grant funding for solar photovoltaic (PV) installations, by providing technical advice, feasibility work and, once funding has been secured, by carrying out the installations.

Solar 4 Schools has also partnered with the Cooperative Bank, with the bank providing match funding to over 150 schools for PV installations, so that the schools have no capital outlay.

Case study - Biomass replacing solid fuel (coal)

Nottinghamshire County Council

Schools account for over 57 per cent of all carbon emissions from Nottinghamshire County Council's estate, with many using coal-fired heating systems – a legacy from the county's coal mining heritage.

Nottinghamshire County Council has carried out a programme of installation of biomass boilers in schools across the county. These installations were particularly targeted at areas using solid fuel (coal) heating systems. This enabled some of the most carbon intensive fuel use in the county to be replaced directly by low/zero carbon technology. To date 30 boilers have been installed at 25 schools, at a cost of almost £1.4m. These, and a further 18 installations planned over the next year, will reduce CO₂ emissions by a total of 4,343 tonnes per year, which is almost 10 per cent of schools' emissions in the county.

The Council's project has also acted as a catalyst for the development of a local supply chain for wood pellets and biomass boiler equipment.

Case study - CHP in school with swimming pool

Hindley Primary School, Wigan

Hindley Primary School is a new 231 pupil school comprising classrooms, a hall, an ICT suite, various resource and group rooms, home economics facilities and a swimming pool. A mini-Combined Heat and Power (CHP) unit has been installed, to provide heat and electricity throughout the school. The long running hours associated with heating the swimming pool make CHP an ideal technical solution, reducing carbon dioxide emissions by around 20% compared with the current UK mix of electricity generation and heat from gas fired boilers.

6. Comparison of costs and carbon

Path A

Policy	Carbon reduction by 2020	Relative additional cost	Relative financial benefit
BAU reduction in carbon emissions	1,214,802 tCO ₂ e		
Zero carbon new build from 2016	18,453 tCO ₂ e		
Interim new build standard 2013-2015	4,963 tCO ₂ e		
Tougher carbon standards in BSF and PCP	352,210 tCO ₂ e	£££	££
Roll out of smart metering	64,198 tCO ₂ e	££	££
Behavioural change programmes	142,662 tCO ₂ e	£	££
Refurbishment and rebuilding of all remaining primary schools	270,545 tCO ₂ e	£££	££

Additional carbon saving above BAU	853,031 tCO₂e		
Total carbon saving	2,067,833 tCO₂e		
Percentage reduction on 2004 (including BAU 35% reduction)	59%		

Path B

Policy	Carbon reduction by 2020	Relative additional cost	Relative financial benefit
BAU reduction in carbon emissions	1,214,802 tCO ₂ e		
Zero carbon new build from 2016	18,453 tCO ₂ e		
Interim new build standard 2013-2015	4,963 tCO ₂ e		
Tougher carbon standards in BSF and PCP	352,210 tCO ₂ e	£££	££
Roll out of smart metering	64,198 tCO ₂ e	££	££
Behavioural change programmes	142,662 tCO ₂ e	£	££
Minor refurbishment of primary schools	11,896 tCO ₂ e	££	££
Minor refurbishment of secondary schools	19,175 tCO ₂ e	££	££
Renewables retrofit programme	42,852 tCO ₂ e	£££	££
Additional carbon saving above BAU	656,409 tCO₂e		
Total carbon saving	1,871,211 tCO₂e		
Percentage reduction on 2004 (including BAU 35% reduction)	53.3%		

7. Research

Some unanswered questions remain about the opportunities available to reduce energy consumption and carbon emissions across the English schools estate.

One concerns the potential to reduce carbon emissions through refurbishment of schools, which DCSF plans to research in 2009-10. This research will explore:

- The potential for reducing carbon emissions through major refurbishment of existing school buildings and through minor refurbishment and retrofit measures
- The impact of factors such as school type, age and size
- The costs and savings attributable to refurbishment and retrofit measures, including prioritisation of measures on the basis of cost per tonne/kg of carbon saved
- Opportunities for co-funding, specialist technical advice and other support

In addition, research is needed to inform development of appropriate levels for carbon standards for primary and secondary schools, and to understand the impacts of extended school hours and wider community use of school buildings on energy and carbon emissions. There is also an opportunity to explore the opportunities and benefits of ICT as a route for reducing emissions.

Similarly, research is needed to indicate those levels of carbon reduction which could be achieved practically for new build schools, schools with varying levels of refurbishment, and for

retrofit measures that target carbon reductions. Research needed into the likely costs and affordability of such measures will be essential.

The case for low carbon school buildings could be strengthened by making more explicit links to aspects of the school curriculum dealing with climate change, energy, citizenship and enterprise, where school buildings can become a tangible learning resource. The need to empower young people for life in a sustainable world is a key objective of DCSF's Sustainable Development Action Plan, and of critical importance to the current and future wellbeing of pupils and their families.

8. Longer term options

A pathway has been identified here which would see roll-out of renewable energy to cover 20% of the energy requirements of 20% of schools. This should be a milestone rather than an end-point for deployment of microgeneration technologies in schools. There is scope to see both an increased number of schools with renewable energy technologies and an increased proportion of energy being provided from low carbon and renewable sources.

Our knowledge of refurbishment will grow over the coming years, and products and technologies will emerge into the market which can be made available to schools. The major capital programmes stimulate refurbishment, but that should not be seen as the end of the journey that a school building will make. Programmes to stimulate further waves of refurbishment will need to be developed in the longer term – both to drive down carbon emissions and to help schools adapt to a changing future climate.

Section D: Reducing emissions from school travel and transport

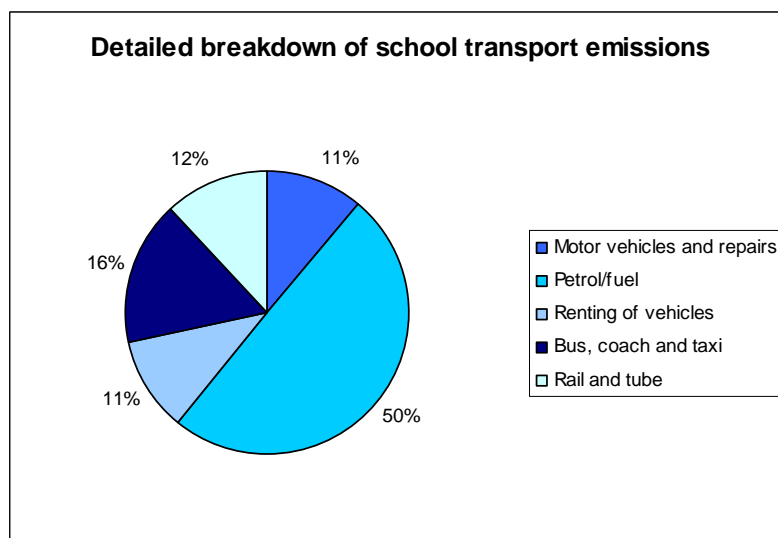
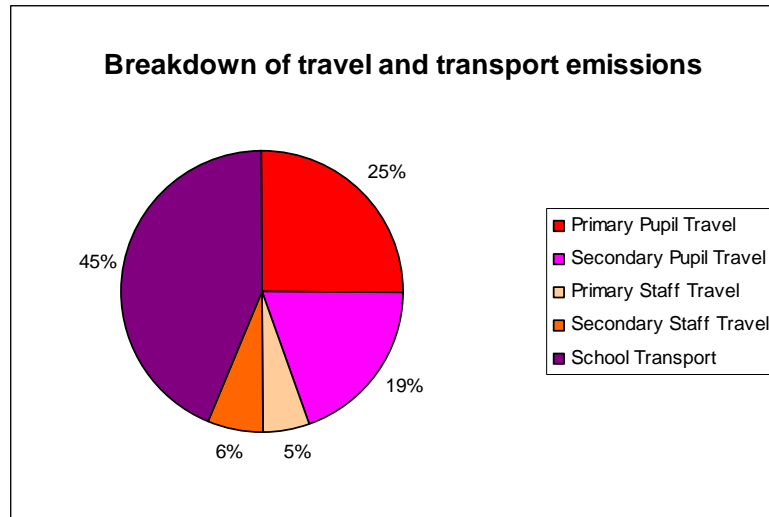
1. Context

Journeys to and from school by staff and pupils and travel on school business account for 16% of the schools carbon footprint.

School travel is defined as travel by pupils and staff to and from school. It is based around the

use of fuel (petrol, diesel etc) of different modes of travel used by staff/pupils.

School transport is defined as that carried out on school business (e.g. school trips, journeys to meetings). Broadly, this category of emissions includes all the impacts of the manufacture and use (through petrol/diesel) of vehicles used by the school. This includes schools' purchase and rental of vehicles (cars, minibuses etc), and use of coaches, taxis, rail, tube, sea and air transportation, as well as the purchase and use of petrol. The chart below breaks down school transport emissions into more detailed segments:



Travel by air and sea make up less than 1% of the school transport footprint.

2. Commentary

2.1 Pupil travel

DCSF data from 2007 suggests that the pattern of increased private car use may be changing. This data is based on returns from the 56% of schools with Travel Plans and a small number of those without; whilst the findings in the data are positive, we should bear in mind that schools with Travel Plans are most likely to have taken action to make improvements; also that one year does not make a trend.

Data on the major modes of travel is summarised in the tables below and compared with the findings of the 2006 National Travel Survey (NTS).

The small reduction in the percentage of children travelling by car is welcome. It's worth noting, however, that, of the primary school children travelling to school by car, over 30% travel less than half a mile. A further 20% travel between 0.5 and 1 mile. So **one-fifth of all primary school children are being driven to school when walking is a highly viable alternative.**

Pupil travel to primary schools

Mode	% National Travel Survey 2006	% DCSF data 2007
Walking	52%	55%
Car or car share	41%	40%
Cycling	1%	1%
Public Transport	5%	3%

Pupil travel to secondary schools

Mode	% National Travel Survey 2006	% DCSF data 2007
Walking	41%	44%
Car or car share	20%	19%
Cycling	3%	3%
Public Transport	31%	32%

Of the secondary school children travelling to school by car, 53% travel less than 1.5 miles.

- At a national level, there are some patterns of behaviour which offer opportunities for early and sustained success. Primary schools present a major opportunity – particularly in reducing the number of short, avoidable car journeys to school.
- It is important to recognise local variations and think in terms of travel systems and patterns of movement at a local/sub-regional level. This is not simply a split between urban and rural behaviour. NTS data suggests that smaller urban areas have more sustainable travel

patterns than large urban or metropolitan areas.

- It is important for the individual school to understand its travel patterns – for health, wellbeing, safety and environmental reasons.
- The end result of action to reduce emissions from pupil and staff travel is easily recognisable. Modal shift away from private car travel is the immediate priority.
- School transport accounts for 45% of travel and transport emissions. Whilst our first priority is to move away from private car use, in the medium/long term, we will need to consider a shift from school

buses, trains etc, to even more sustainable modes of travel.

- This end goal is desirable for multiple reasons (health, wellbeing, congestion, air quality). We have a unique opportunity to align multiple policy objectives within the same programme of action.
- A great deal is already taking place to address pupil travel emissions. We can continue with the same activities but the rate of change needs to increase, ie, we need to do more of the things that are already under way. We also need to make sure that action is taking place consistently across regions and nationally.
- International school travel may require consideration of offsetting or over-achievement of savings in other areas. There is no effective data set for international (or national) travel by schools (for school trips, exchanges etc).

2.2 Staff travel

- There is no national data set for staff travel to and from school (teaching staff or others).
- Modelling based on the National Travel Survey 2006 suggests that staff travel accounts for 11% of travel and transport

emissions. Whilst this is a small proportion relative to pupil travel and schools transport, it is important to address – teachers and other school staff act as role models to children and young people, and practicing what you preach cannot be underestimated.

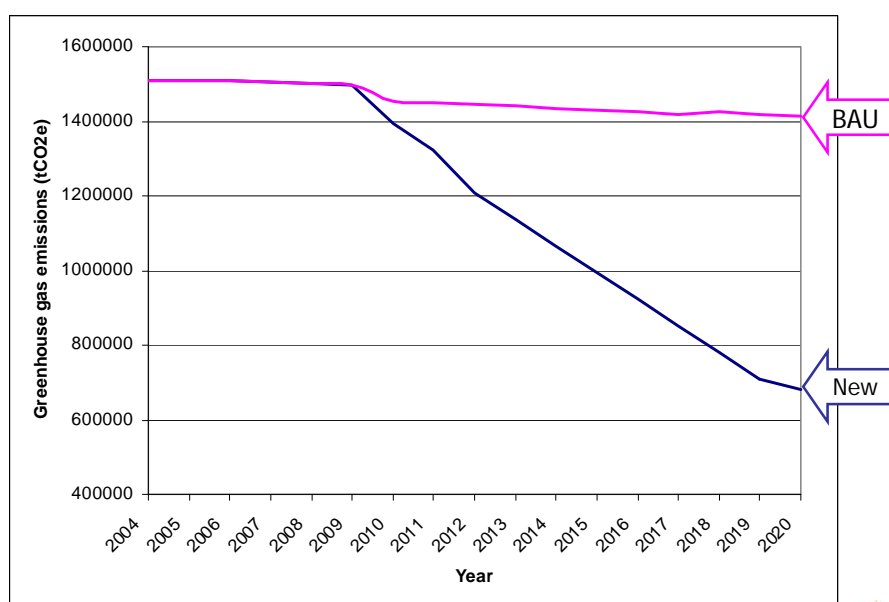
2.3 School transport

- School transport emissions are significant, making up almost half of the overall travel and transport footprint. Calculations are based on national data for schools' expenditure on different types of vehicles and fuels. There is no bottom-up data available for the number, type and distance of journeys and trips undertaken within this category.

3. Expected outcome of interventions

We have outlined below a package of policies, mainly based on evolution of existing policy and practice, which is designed to deliver a **54.8%** reduction in greenhouse gas emissions by 2020, an overall saving of **827,785 tCO₂e**.

The chart below indicates the Business As Usual trajectory for emissions related to school travel and transport and the new trajectory based on the proposed package of policies.



4. Package of interventions

4.1 Strategic framework

4.1.1 School Travel Plans

The existing School Travel Plan framework provides a context within which activity to reduce school travel carbon emissions can easily sit. Some modification of the School Travel Plan framework would support emissions reduction work, particularly:

- Requiring a more explicit focus on action arising from the Travel Plan which encourages a shift to more sustainable modes of travel
- Including staff travel within the School Travel Plan structure (teaching and non-teaching staff). This would help to build a national data set for staff travel and also present opportunities for personalised travel planning and communications/awareness campaigns among school staff.
- Including journeys within the school day along with school trips and excursions within School Travel Plans in order that a national data set can be established over time. This can help policy makers gain a sense of scale of school trips, particularly international travel, and underpin discussions of how best to balance educational benefits and environmental impacts.
- Encouraging the integration of School Travel Plans with those of other schools, the NHS, the local authority and other major local employers. Local authorities should be encouraged to consider travel and transport systems and their links and interdependencies. For instance, at present we have no picture of where parents go after the school run. If their journey patterns are to major employers or to retail/leisure facilities, this creates an opportunity for alternative, sustainable local provision of public transport or

walking/cycling routes.

- Encouraging continuous improvement in school travel plans so that there is continued momentum in supporting sustainable travel
- Establishing a timetable for the review of plans with the expectation of persistent and continuing modal shift.

Impact/Outcome

Embedding carbon reductions within the existing strategic framework limits any additional burden on local authorities and schools. Broadening the scope of School Travel Plans will require additional activity (eg, in surveying school staff), but the value of this activity as a platform for further policies is extremely high.

4.1.2 Data and monitoring

School Travel Plans are only as good as the data on which they are developed. Establishing better quality data sources to underpin School Travel Plans could help schools and School Travel Advisors to target their activities more effectively.

It could also provide a basis for more consistent monitoring (for example, establishing a consistent method of measuring the impact of schemes, benchmarking of activities and comparison of schools and local authorities).

Improved school travel data can also link into local authority work on National Indicator 186 (Per Capita Carbon Emissions in the local authority area). In particular, it can help local authorities to better understand the impact of school travel and the opportunities for interventions.

Existing data sources can be better used (as evidenced by the Dorset County Council case study below). It is important that Regional and Local School Travel Advisers understand the data that is available to them and how it can be used and interpreted. Existing data can also be used to inform individual schools of their performance and to identify actions.

Case study - Effective data

Dorset County Council

Building on the data provided by the Schools Census, Dorset County Council has developed a spreadsheet tool which maps:

- Mode of travel by school year across the County
- Mode of travel by individual school
- Proportion of children living within an agreed walking distance of the school (0.8 miles for primary pupils, 2 miles for secondary pupils)
- Distance travelled by mode by individual school
- Carbon emissions from pupil travel for the school day and the school year by individual school (ie, how many kg carbon dioxide came from the school run at Bridport Primary School?)
- Calories burned by mode by individual school (ie, how many calories are burned by children cycling to Bridport Primary School?)

The spreadsheet feeds into a School Travel Health Check for each individual school which outlines how they are currently performing and opportunities for improvement action.

See www.viewfinder.infomapper.com/dorset/resources?id=951174 for further information.

Impact/Outcome

Improved data enables better targeting of activity by schools or local authorities, enhanced monitoring and benchmarking.

4.1.3 Funding

The provision of capital funding in support of School Travel Plans (and through capital programmes such as Building Schools for the Future) has been effective in increasing the provision of cycle paths/facilities, storage and lockers, and other supportive infrastructure for cycling/walking to school. It has also provided enablers which reduce the need to travel, for example, ICT systems such as video conferencing.

Existing capital funding could be redirected in such a way that it specifically supports sustainable modes of travel to school, for pupils and for staff.

The split between capital and revenue budgets is often problematic. Where capital works have been undertaken (or are not required), the role of local authorities is much more around communications and engagement. Revenue funding could be used to enable wider supportive activities such as communications campaigns (this

has occurred in London and provided more flexibility of approach).

5. Initiatives/Policies

5.1 School Transport

The following policy options are encouraged as a means of reducing emissions from school transport (including overseas trips):

5.1.1 Support to schools for procurement of higher than national average efficiency vehicles and/or low carbon vehicles

Schools and local authorities can use their purchasing power to require higher standards of fuel efficiency in their own new vehicles and from contracted out bus / coach / taxi services. This would entail:

- The development and provision of standard procurement specifications or lease clauses to help overcome any anxieties that schools or local authorities may hold about procurement regulations.
- The provision of clear guidance on whole life costing for vehicles to help to make the business case in the case where more

efficient vehicles carry a higher capital cost.

- Incentivisation of schools to convert existing fuel vehicles to LPG or other low carbon fuels. This would help to reduce vehicle running costs for schools whilst ensuring that the existing fleet is as efficient as possible for the remainder of its lifetime. Capital grants associated with School Travel Plans could be redirected for this purpose to help offset the cost of conversion.
- It will be important to consider the impact of higher specifications on smaller, rural bus operators.

The Business As Usual projection is for the school fleet to improve in efficiency by 1% per year. To reflect higher procurement standards, this improvement has been increased to 3% per year, saving **56,584 tonnes of carbon dioxide equivalent by 2020**.

LPG is estimated to save 10-15% of the CO₂ emissions associated with petrol or diesel. We have modelled conversion of a proportion of the school fleet as the equivalent of a 1% reduction in petrol purchased by the sector, saving **32,413 tonnes of CO₂e by 2020**.

5.1.2 Transport planning and eco-driving training

School transport (ie, journeys on school business) could form part of the School Travel Plan framework to ensure that data is captured. This can then inform organisational travel planning provided by local authorities to schools.

Regular drivers of school vehicles, for example teaching staff who coordinate school trips, school bus drivers (whether employed or contracted out) and site staff could be offered eco-driving advice/training. With contracted out bus services, this can be part of the procurement specification.

We have estimated that integrating school business journeys into School Travel Plans could save 1% of petrol use nationally. This is equivalent to **32,413 tonnes of CO₂e by 2020**.

Eco-driving can save between 5% and 15% of fuel. We have modelled that 20% of schools will undertake eco-driving training saving 5% of their fuel, equivalent to a 1% saving in petrol use nationally (**32,413 tonnes of CO₂e by 2020**).

5.1.3 School bus provision

The threshold for free secondary school transport provision could be reduced from 3 miles to 2 miles. DfT data indicates that there is a significant difference in mode for children travelling 2-3 miles compared to children travelling 3-5 miles (and therefore having access to free school transport, usually a bus service). The difference is particularly marked for secondary schools – 40% of pupils travelling 2-3 miles travel by car and 35% by bus. When the distance increases to 3-5 miles, 29% travel by car and 60% by bus.

Greater provision of “door to door” bus services would help to encourage bus use in areas where car use remains persistently high, overcoming parental concerns about traffic danger and other risks when walking / cycling. (This could be seen as a stepping stone policy to change attitudes towards bus travel/safety issues. In the longer term, there will need to be a shift away from bus travel to walking / cycling.)

The travel impacts of extended school hours are not yet understood. Travel Surveys should consider travel to and from school to map out patterns for early mornings / early evenings. School Travel Plans should be reviewed to ensure that there is demand-based bus provision (and safe, well lit walking / cycling routes) to cover activities during extended hours. This connects to work on safer routes to school for pupils who may be travelling to / from school when it is dark. Consideration will need to be given to the monitoring of travel to / from school outside core hours.

If the travel patterns for secondary school pupils living 2-3 miles from school were the same as those living 3-5 miles away, this would imply an 11% reduction in the number of children travelling to school by car. We have modelled this along with a reduction in average journey length of 1km. This results in a saving of **60,063 tonnes of CO₂e by 2020**.

It is important to consider that children living 2-3 miles from school are also within easy cycling distance and targeted by programmes such as Bikeability. We have not allocated any carbon savings to door to door bus services or travel planning around extended schools at this stage.

5.1.4 School trips and excursions

We recognise that school trips and overseas travel can offer significant educational benefits, particularly relating to the Global Dimension doorway with the Sustainable Schools Framework. Our approach to school trips is therefore to provide information and encouragement to schools, rather than to penalise or limit the opportunities available to them (although this approach should not be ruled out in the longer term if required).

There is a lack of data about the extent and nature of trips undertaken by schools. This research need is discussed later in this chapter.

To support schools in making sustainable choices about school trips and excursions, a database could be developed highlighting destinations for school trips that can be reached by sustainable modes (within the UK and overseas where appropriate). Destinations could be categorised according to the educational outcomes that they can offer so that teachers can identify locations which are appropriate to their curriculum needs. Sporting and cultural exchanges could also be

encouraged through a database / networking approach.

Technology can also be used to reduce the need to carry out school trips, through video conferencing (such as the JANET Videoconferencing Service (JVCS)) and other collaborative technologies.

Where trips take place that have a significant carbon impact (eg, those involving flights), schools should be encouraged to balance out these increased emissions **by taking action to reduce their own carbon impact in other areas**. This is not the same as contributing to an offsetting programme. Rather it requires the school to consider what can be done to reduce its own carbon impact from procurement, energy or other travel activities to balance out the emissions arising from the trip.

We have not allocated any carbon reductions to changes in school trips or excursions. Activities in this area are likely to have limited carbon impact in the context of the overall footprint, but would lead to an increased consciousness of carbon when making excursion plans. There are also potential positive economic impacts on destination communities in the UK.

5.1.5 Impact/Outcome of school transport policies

The table below outlines the modelled carbon savings and relative costs and financial savings available from different courses of action.

Policy	Carbon reduction by 2020	Relative additional cost	Relative financial benefit
Procurement of more efficient vehicles	56,584 tCO ₂ e	£	££
Conversion of vehicles to LPG	32,413 tCO ₂ e	£££	££
School transport planning	32,413 tCO ₂ e	£	£
Eco-driving	32,413 tCO ₂ e	£	£
Reducing bus threshold for secondary schools	60,063 tCO ₂ e	££	
Total carbon reduction	213,886 tCO₂e		
% saving on travel and transport footprint	14.2%		

5.2 Pupil travel to school

5.2.1 Walking and cycling promotions

The existing programme of communications campaigns could be strengthened. Many campaigns are carried out on a local / regional basis and are time-limited (eg, a week of action).

Ongoing campaigns, with seasonal messaging, high profile celebrity endorsement, and close links to highly visible campaigns like Change 4 Life, would help to encourage walking and cycling. The core messaging is likely to be around health and wellbeing, but the “spin-off” benefits in terms of carbon reductions could be significant.

Communications campaigns need to be supported by enabling infrastructure and information. Distance and time signs on walking / cycling routes to schools can demystify journeys (ie, walking a mile sounds much harder than walking for 20 minutes); including local information about sights, buildings or biodiversity can also help build learning into the school journey. Maps for pupils and parents can also provide reassurance that routes are safe.

According to DfT Transport Statistics, 90% of boys and 88% of girls aged 5-10 own bicycles. Ownership rates reduce after age 11, with 80% of boys aged 11-16 and just 69% of girls in that age

group owning bicycles. Given these high levels of bicycle ownership, policies need to encourage the **use** of bicycles (rather than discounts or loans for purchasing bicycles).

A consistent national programme of cycle training, building on the existing Bikeability programme, including on street cycling on major routes to school, and access to free or discounted helmets, high-visibility jackets and bicycle lights should help to promote greater use of bicycles by pupils. Off street routes that are clean, well-lit and signposted will also encourage more cycling. In targeting those children who currently travel by car, there will need to be an accompanying programme of parent engagement (see below). Local authorities should continue (and if possible accelerate) their work to encourage and support schools to provide storage facilities and showers for pupils to use.

We should also recognise that many children and young people will view their bicycle as a toy rather than as a deliberate mode of transport. Making the links between the mundane journey to school and the far more exciting elements of play can help encourage more pupils to cycle as part of their everyday experience. Linking cycling to incentives or rewards could deliver increased uptake.

Case study - Promoting cycling

Cherwell School, Oxford

Cherwell School has placed a priority on sustainable travel, and has consistently been one of the best performing schools in the UK. Of its 1790 pupils, 87% travel to school by sustainable means, with 48% of pupils cycling. Local cycle routes – many of which are away from traffic - and provision of bike storage facilities have helped encourage more pupils to cycle to school, as have maps, cycle helmet awareness raising and a cycle maintenance course. Cherwell aims to increase its cycling rate to 55%, by overcoming pupil fears about safety on street-based cycle routes and concerns about security of bike/helmet storage.

Cherwell School has expanded its School Travel Plan to gather data about staff travel and to ask parents for their views on travel to and from the school.

Case study – Balancing travel and play

Burnwood Primary School, nr Stoke on Trent

Burnwood Primary School has embraced children's interests in riding bikes by developing a range of projects to improve both safe routes to school, secure cycle parking and cycle track facilities at the school. As well as a suite of cycling promotion activities, Burnwood has invested in a "Tri-Track" – a large playground with cycle track markings, a banked velo track and a mountain bike trail. Children are encouraged to travel to school by bike but then also to incorporate their bikes in break- and lunchtimes. The number of children cycling to school increased from a handful to around 50 in just two years.

Impact / Outcome

Some of our leading schools have cycling rates approaching or above 50%. We see no reason why other schools should not aspire to these levels.

We have modelled cycling promotions to deliver a 40% modal shift from car to bicycle for primary school children (we have split the modal shift for secondary school children into 38% from car and 2% from public transport). Cycling promotions in primary schools would deliver **90,626 tCO₂e by 2020** whilst secondary schools would deliver **71,092 tCO₂e**.

For walking promotions, we have assumed a 40% modal shift away from car travel for both primary and secondary schools. This leads to a further **141,282 tCO₂e** from primary schools and **98,340 tCO₂e** from secondary schools.

5.2.2 School Zones

Car-free zones around schools offer a significant number of benefits:

- A quarter-mile or half-mile perimeter would reduce the distance travelled by cars by that amount per journey
- Parents who drive their children between half a mile and one mile to school would be discouraged from driving, encouraging modal shift
- Children travelling to school would have a walking opportunity built in to every school day, providing health benefits
- Congestion around schools would be

dispersed to multiple "drop-off" points away from the school site

- Road safety around schools would be improved, reducing risk of accidents involving children

Whilst these schemes offer a number of benefits, they also present a number of obstacles to overcome:

- Highways and infrastructure upgrades in drop-off points (e.g. turning circles) or identification of parking places for parents who wish to accompany their children the remainder of the way to school (e.g. local pubs, churches etc)
- Resident resistance (particularly those living around drop-off points)
- Parent resistance

Local authorities would need to carry out communications and engagement campaigns to overcome resident and parent resistance and to build infrastructure upgrades into their overall transport strategies. A growing number of schools and local authorities are already engaged in car-free zone / Park and Stride type schemes, including schools in Cornwall, Bedfordshire, Lincolnshire and Lancashire providing a battery of case studies to help overcome local resistance.

More widespread roll out of a voluntary scheme could be encouraged, with a view to a mandatory car-free zone around schools if progress is not delivered through voluntary means.

Case study – Park and Stride

Durham Gilesgate Primary School

Analysis of a parents and pupil travel questionnaire revealed that less than half of the pupils walked on their school journey, even though the majority of them lived less than 1km away from school. Representatives from the School Council suggested that an ‘exclusion zone’ for parental vehicles should be created around the school site to reduce the number of parental vehicles parked in the area. A “five-minute zone” was mapped out and then overlaid on the maps which showed the location of the pupils’ homes. Any pupils living within the zone were advised that they needed to walk for the entire school journey. Those pupils who lived outside of the zone were advised to park beyond the zone boundary in a socially acceptable place and walk for the remaining part of the journey.

Impact/Outcome

We have assumed a fairly widespread programme of car-free zones around schools, with an average reduction in all car journey lengths of 400 metres.

In addition to the reduction in journey length, we anticipate that some journeys from just outside the car-free zone will not happen at all. We have assumed that 10% of pupils and staff will shift from cars to walking as a result of this policy. The impact of this is to reduce carbon emissions from car travel by **110,234 tCO₂e by 2020**.

5.2.3 Parent engagement programmes

Travel choices, particularly for younger children, are often made by parents, who have their own concerns about road safety, crime, bullying and punctuality.

Providing parents with information about safe routes to school can help them to make decisions in favour of more sustainable travel options. This is happening in many areas through School Travel

Plans feeding into local authority Sustainable Modes of Travel Strategies. Maps, in particular, help parents to understand where their children are likely to be walking/cycling and to follow the same route themselves. Local authorities are already encouraging schools to provide maps; however, better communication of good practice might help to accelerate this process on a more consistent basis across the country.

There are transition points in a child’s education where travel behaviours may tend to change. Parents of children who are about to start primary school should be provided with information about local school travel provision in their areas. Likewise, parents of Year 6 children should be specifically given information about travel options to secondary school.

High visibility bands/jackets for children who are walking / cycling are also popular with parents, although these tend to be more suited to primary school pupils.

5.2.4 Impact / Outcome of pupil travel policies

Policy	Carbon reduction by 2020	Relative additional cost	Relative financial benefit
Primary cycling promotion	90,626 tCO ₂ e	££	£ For parents
Secondary cycling promotion	71,092 tCO ₂ e	££	£ For parents
Primary walking promotion	141,282 tCO ₂ e	£	£ For parents
Secondary walking promotion	98,340 tCO ₂ e	£	£

			For parents
Car-free zones	110,234 tCO ₂ e	£	£
			For parents
Total carbon reduction	511,574 tCO₂		
% saving on travel footprint	33.8%		

5.3 Staff travel

5.3.1 Staff engagement programmes

Staff travel accounts for 11% of the travel and transport footprint and is largely untouched by existing sustainable travel activity. This figure is based on National Travel Survey data as staff travel data is not captured by the national schools census carried out by DCSF.

Some schools and local authorities (such as Southampton and Slough) have started to gather staff travel data through surveys. School staff are much more likely to travel by car than pupils, citing journey distance, paperwork that needs to be carried and lack of alternative transport provision as barriers to change.

Staff have a role to play, however, in “practicing what they preach”. Pupils, particularly at secondary school age, understand that there is a double standard at work when they are being taught about sustainability but when the people around them are not behaving in a sustainable way.

Local authorities and schools should be supported to deliver a programme of support for sustainable staff travel, encompassing:

- Inclusion of staff travel as a standard element of School Travel Plans
- Personalised travel planning for new staff (as part of an induction programme) and for existing staff, preferably at the start of each school year.
- Embedding sustainable travel as a leadership behaviour in training for head teachers and senior teaching staff
- Local incentives for sustainable travel, such as loans/discounts for staff purchasing bikes
- Free public transport passes for school

staff

Pilot projects to support sustainable staff travel should be encouraged, for example:

- Grants/discounts for electric/hybrid vehicle purchase (by staff and schools) coupled with investment in charging points at schools
- Additional incentives within employment packages for staff who do not travel by car (eg, a sustainable travel bonus)
- The use of collaborative technologies for staff development and distance learning

Impact/Outcome

Our modelling suggests that a programme which delivers a 10% modal shift from car travel to a combination of cycling, walking and public transport would lead to **6,942 tCO₂e reduction by 2020**.

Whilst this represents only a fraction of the transport carbon footprint, it has wider benefits related to leadership by example and potentially healthier teachers with fewer days lost to illness.

It also presents the opportunity to free up space on school sites that was dedicated to parking and can now be used for play.

5.4 New build

New schools constructed within Building Schools for the Future or the Primary Capital Programme should make sustainable travel a core feature of their design, including their location. Existing requirements around travel plans should be tightened as far as possible to ensure that adequate routes to school and onsite infrastructure are provided for both pupils and staff.

A “zero car” school may not be achievable, but incentives and support should be given for significant reductions in the numbers of car journeys made (monitored over a period after the school is occupied).

Impact/Outcome

Improving transport requirements from new build schools will lead to an emissions reduction; this has not been modelled at this stage. It also means that sustainable travel is embedded in the school from the very beginning, setting the model for future schools.

6. Comparison of costs and carbon

Policy	Carbon reduction by 2020	Relative additional cost	Relative financial benefit
Procurement of more efficient vehicles	56,584 tCO ₂ e	£	££
Conversion of vehicles to LPG	32,413 tCO ₂ e	£££	££
School transport planning	32,413 tCO ₂ e	£	£
Eco-driving	32,413 tCO ₂ e	£	£
Reducing bus threshold for secondary schools	60,063 tCO ₂ e	££	
Primary cycling promotion	90,626 tCO ₂ e	££	
Secondary cycling promotion	71,092 tCO ₂ e	££	
Primary walking promotion	141,282 tCO ₂ e	£	
Secondary walking promotion	98,340 tCO ₂ e	£	
Car-free zones	110,234 tCO ₂ e	£	
Staff travel	6,942 tCO ₂ e	£	
Carbon saving from above policies	732,402 tCO₂e		
BAU saving	95,383 tCO₂e		
Total carbon saving to 2020	827,785 tCO₂e		
Percentage reduction on 2004 travel footprint	54.8%		

7. Research

A number of research needs remain outstanding:

- **How persistent is modal shift?**
A clear research base needs to be developed about the persistence of modal shift, that is, if a pupil is persuaded to change their travel patterns through a campaign, how long will that change endure?
- **Are journeys to and from school carried out in the same way?**
Many travel surveys focus on travel to school (and indeed many campaigns use the same language). But journeys home from school may follow different patterns, especially if they take place after dark. By understanding parent/pupil choices for the round trip, more targeted actions can be developed.
- **What are the travel and carbon impacts of school choice and multi-site education?**
School choice is a central part of national policy; however, the recent Transport Select Committee report on School Travel identified “a tension between promising choice of school and promoting sustainable school travel.” Developing an understanding of the travel impacts of school choice, and their related carbon emissions, should help to inform strategy development at both a national and local level.

Research to identify travel patterns between school sites (whether one school or different schools) will help to assess the impacts of travel during the school day. This is particularly important for understanding the carbon impacts of 14-

19 diplomas and the opportunities available from collaborative ICT technologies.

- **Where do school run journeys lead?**
Local or regional studies should explore where the car driver goes after the school run. We do not yet know how many drivers go on to work or leisure sites and how many return home. For those travelling onwards, the scope for integrating school and other travel plans can be explored (see above).

8. Longer term options

Actions for the longer term will be largely dictated by achievements in the period to 2020, with a greater or lesser degree of compulsion being applied.

Options that may be appropriate for consideration in the longer term include:

- Once there is a better understanding of the travel and carbon impacts of school choice, examining how the policy framework can be modified to deliver the optimum combination of educational and environmental outcomes
- Engaging on a more intensive basis with school staff, to encourage or incentivise them to live as close as possible to the school at which they work and to discourage use of private cars
- A mechanism for minimising the carbon emissions associated with international travel
- Introduction of specific congestion charging zones around schools, for example, in areas where car-free zones have not been effective

Section E: Reducing carbon emissions from school procurement and waste

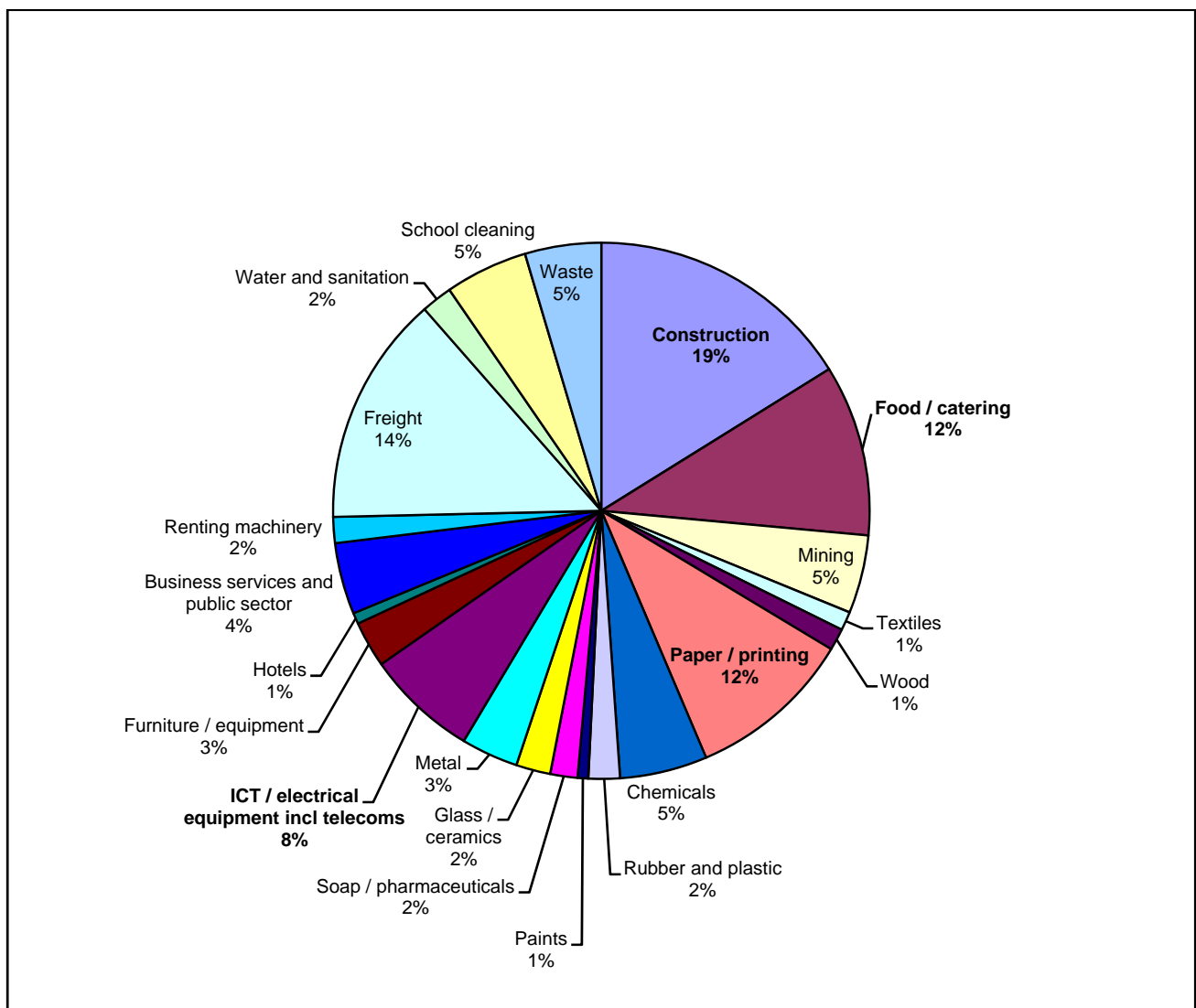
1. Context

The 2008 analysis of the English schools estate carbon footprint estimates that **47% of the national schools' carbon footprint is related to emissions in the supply chain**, including goods

and services purchased by schools and the impact of schools waste.

The chart below shows a more detailed sector breakdown of the schools procurement carbon footprint – it is necessarily an extremely busy chart in order to reflect the diversity of goods and services purchased by schools. Further explanation of the procurement footprint is provided after the chart:

Schools procurement footprint with breakdown of major sectors



The chart shows that the major product and service categories contributing to the carbon footprint are:

- **Construction** – 698,276 tCO₂e per annum (19% of procurement emissions). The majority of this will be the large scale capital construction programmes, but incidental / small scale repairs and maintenance are included here.
- **Paper and printing** – 431,916 tCO₂e per annum (12% of procurement emissions). As well as office / photocopier paper, this will include all printed materials such as textbooks, handouts, resource packs and the carbon associated with the printing industry. (NB. This does not include electricity used in schools to run printers / copiers.)
- **Food and catering** – 446,706 tCO₂e per annum – 12% of procurement emissions. Includes impacts of food production and processing plus emissions associated with the manufacturing of catering equipment. This does not include the energy used in schools to power catering equipment.
- **ICT and electrical equipment, including telecoms services** – 291,264 tCO₂e per annum (8% of procurement emissions). These emissions are those generated in the supply chain (manufacture, distribution); again, they do not include the electricity use within schools to power equipment, so the actual impact is higher. This also includes the CO₂ impact of the telecoms and internet sector (eg, if schools have servers in external data centres, plus schools use of online services).
- **School cleaning** – 5% of procurement emissions – 215,853 tCO₂e per annum
- **Chemicals** – 228,078 tCO₂e per annum (5% of procurement emissions). These are the emissions associated with the production of basic chemicals, dyes, fertilisers etc that go into the things that schools purchase. They are not finished products (such as cleaning fluids). Whilst this is an area of relatively high emissions, it is quite difficult to unpick in terms of how it manifests itself in school procurement.
- **Waste** – 198,580 tCO₂e per annum (5% of procurement-related emissions). Waste (like food) has a higher relative impact when all greenhouse gases are taken into consideration (rather than when only CO₂ is counted).
- **Metal** - 141,691 tCO₂e per annum (5% of procurement emissions). These are the emissions from the manufacture of metal (iron, steel) that is then used by the schools sector. Much of this will be related to construction projects. It also includes metal products such as radiators and hot water tanks, and smaller items such as cutlery, locks, tools, screws.
- **Business and financial services** - 132,642 tCO₂e per annum. These are the carbon emissions created in the offices of the banks, building societies, accountants, lawyers and others used by schools.
- **Mining** – 148,991 tCO₂e per annum. These are the emissions associated with the production of gas, oil, coal, stone used by schools. For example, if ornamental stone is used in a school garden, the emissions related to the extraction of that stone from a quarry are in this category. Another example: if a school uses gas for heating, the emissions associated with extracting that gas are within this category (the emissions associated with using that gas on site sit within the energy section.)
- **Furniture plus sports / musical equipment** – 3% of procurement emissions- 120,561 tCO₂e per annum.

Note on transport/freight:

Schools' spend on buses, coaches and taxis accounts for 108,441 tCO₂e per annum. These are the emissions created in the manufacture of buses etc. In this analysis, we have included these emissions under the "travel and transport" heading, but they have as much to do with the procurement, specification and management of resources as they do with transport planning.

It is also worth noting that freight emissions count for a very significant 601,703 tCO₂e. These are the 'product miles' associated with delivery of finished goods to schools, suggesting that 'buying local' could have an important positive impact on the procurement footprint.

None of the carbon emissions outlined above are actually created on school site. They arise from manufacturers' use of electricity and fossil fuels to produce items and from the use of fossil fuels to transport products to schools. Through their procurement choices, schools have the opportunity to reduce these carbon emissions.

Note that it is difficult to separate out what is 'low carbon' in product or service from what is more broadly 'environmentally sustainable'. A product manufactured in a plant that is energy efficient may still be made from unsustainable materials, and these issues need to be considered when formulating guidance for schools.

2. Commentary

The Business As Usual trajectory shows procurement emissions increasing by 17% by 2012 from a 2004 baseline, remaining at this higher level until around 2020 and then decreasing to around 6% higher than the baseline figure in the early 2020s. The initial increase is largely due to the emissions associated with construction work arising through the Department's large-scale school building and refurbishment programmes.

The table below spotlights some of the trends and influences impacting on schools procurement emissions.

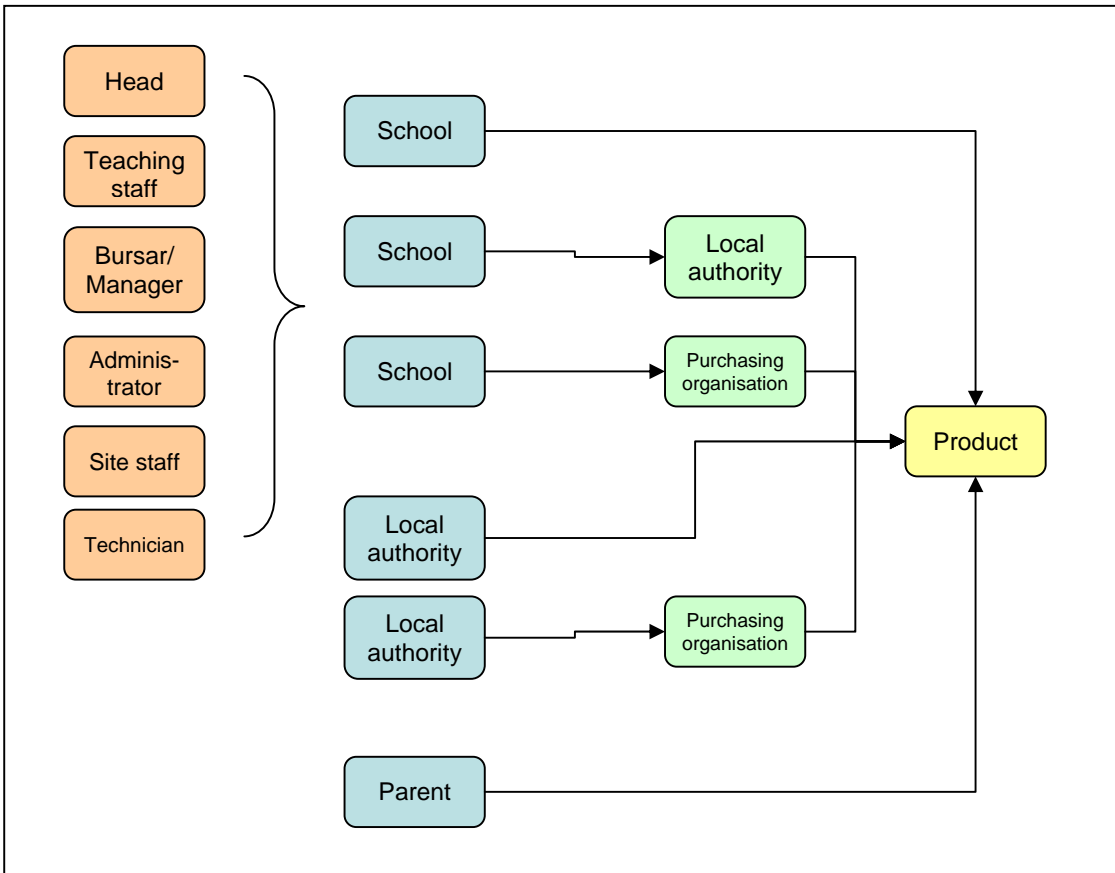
Trend	Impact on carbon emissions
Increased awareness / take up of sustainable procurement frameworks	Decrease
Health and wellbeing agenda for school food procurement	Decrease
Opportunities to embed sustainability in OPEN e-procurement system	Decrease
Capital projects increasing demand for construction materials	Increase
Lack of information about low carbon options	Increase
Real or perceived cost differential of sustainable products	Increase
Lack of alternative products	Increase
Increased procurement of energy intensive products (eg, ICT and electronic equipment)	Increase

There are some notable challenges in reducing emissions from school procurement.

Schools procurement is extremely fragmented. Some decisions are influenced by national frameworks, some by regional or local buying organisations, some by local authorities and some by dedicated or ad hoc purchasers within schools. A policy framework therefore needs to be flexible

and responsive to the different types of purchasing situations which commonly arise and be realistic about the different forms of central intervention that may be required.

The diagram below shows a simplified model of some of the major different decision makers and paths by which a school can purchase a product or service:



Central intervention has real power in situations where specifications are developed for widespread use in the sector, for example, within school building programmes and in the commissioning of ICT. Early action to incorporate carbon reductions into these specifications is crucial.

Low carbon procurement needs to align with the broader objectives of sustainable procurement and delivery of value for money to schools. Where a low-carbon product has a higher up-front cost than a high-carbon alternative, schools need to have the information, procurement tools and

confidence to be able to select the lower carbon option. Awareness raising and communications with schools are therefore essential to create well-informed customers for low carbon products. This means overcoming some institutional barriers at school level:

- **Making it a priority:** procurement of goods and services represents a large proportion of schools' carbon footprint but a small proportion of schools' running costs.

- **Making the business case:** it is often more difficult to make the business case for procurement of sustainable products, particularly where up front costs are higher. There are challenges around embedding a consistent approach to schools procurement, for example, by increasing the use of whole life costing, whilst still maintaining appropriate levels of local autonomy.
- **Lack of information:** ensuring schools have access to information about the carbon impact of different products can help to inform decision making. However, a lot of information around sustainable procurement is in its infancy and there may be a steep learning curve for many schools in this area.
- **Changing behaviour:** increasing the uptake of more sustainable procurement standards and practices by schools, whether purchasing individually or collectively.

across the schools system. It takes into account the different ways in which schools procure goods and services (from very coordinated, centralised frameworks to individuals making ad hoc buying decisions).

The package identifies specific opportunities to address major sources of procurement emissions and actions to address both the demand side (schools and local authorities) and the supply side (product and service companies, supply chain organisations).

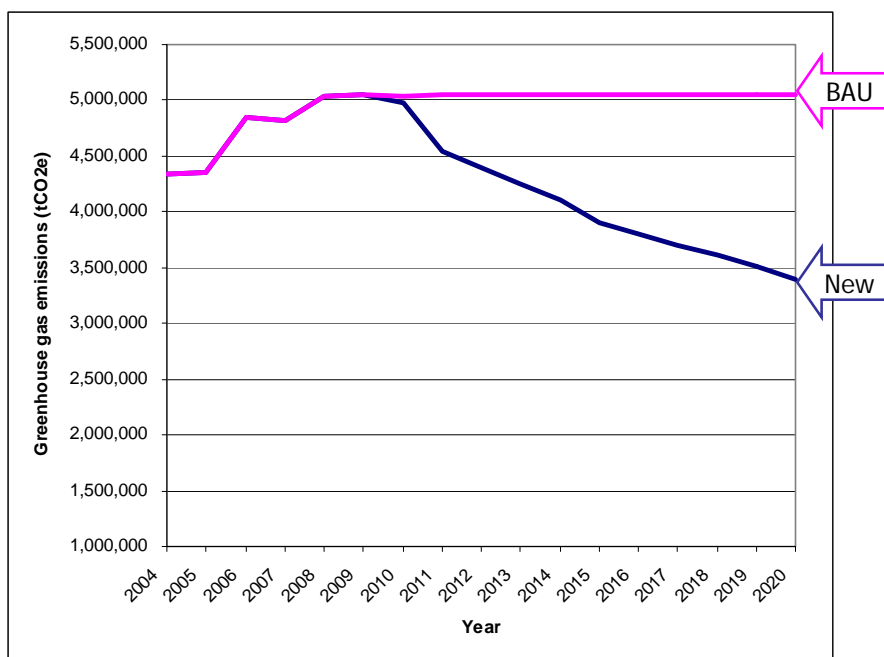
The package of policies outlined below is anticipated to deliver a reduction in carbon emissions of **1,661,931 tCO₂e** by 2020. This equates to a 21.8% reduction in emissions against the 2004 baseline.

It is important to note that emissions from procurement are expected to rise by some 17% in the period from 2004 to 2020. With this policy package, the procurement footprint at 2020 would be 32.9% lower than under the Business As Usual trajectory.

3. Expected outcome of interventions

The package of policy options outlined below aims to deliver a strategic framework across procurement categories which will drive change

The chart below shows a trajectory for reducing carbon emissions from procurement to 2020, compared with the BAU trajectory.



4. Package of interventions

4.1 Strategic framework

4.1.1 Strategic commitment

A clear strategy for mainstreaming sustainability in schools procurement needs to be developed, implemented and communicated. The Department has the opportunity to show leadership to the sector by making a real and public commitment that it will do all that it can help schools buy the most sustainable product options, taking account of economic, environmental and social considerations.

The strategic approach – of which carbon management forms one part – would be based on a roadmap of the availability and stage of development of key goods and services; it would be accompanied by a long-term plan for communication with schools, local authorities and the supply chain, and a commitment to measuring progress.

The product roadmap is essential - it will identify priority procurement categories where action can be taken now, and those which need further development to create sustainable or low carbon alternative products.

4.1.2 Delivery and capacity

The role of DCSF in encouraging carbon emissions reductions from school procurement is in

developing the strategic framework and providing leadership and support to the system. This means developing further capacity within the Department to explore issues of product labelling, supplier accreditation, sharing of best practice and communications with schools and organisations which buy on their behalf.

4.1.3 Supply chain engagement

Engagement with supply chains is well-established in some sectors (eg, ICT procurement, catering equipment and specific foodstuffs), and existing structures and communications channels could be used to ensure that carbon reduction is a core delivery objective.

If the changes outlined below are to be delivered – product and supplier accreditation, demand-based innovation and product development – then close collaboration with supply chain companies is essential.

Engagement is about bringing the whole supply chain together: the Department and its agencies, the Public Sector Buying Organisations, local authorities, schools, as well as product manufacturers and distributors or wholesalers. Some product categories operate in global markets, others in more regional or even local markets, and it is important that influence is brought to bear at the right level within a coordinated framework.

Case study - Environmentally Preferable Purchasing

California State Government

California law requires State government to practice Environmentally Preferable Purchasing. See [Public Contract Code, sections 12400-12404](#) for more information. This applies to California state agencies; however, local governments and school districts are encouraged to practice EPP as well, and can use California state procurement contracts to get discounts on many green products. See <http://greenschools.live.radicaldesigns.org/article.php?id=43>

4.1.4 Specifications

Schools and local authorities need to have the tools at their disposal to be able to procure low-carbon goods and services, without feeling at risk of contravening national or European regulations, and with confidence that they are achieving value for money.

A standard battery of procurement specifications, clauses or paragraphs, which are compliant with regulations, would allow non-experts to simply insert them into tenders by schools and local authorities.

Not only would this enable the take up of greater levels of more sustainable products, but it could also reduce the transaction time / costs for schools in procurement. It overcomes the present challenge of each school or local authority having to “learn for themselves” how to produce specifications which achieve the desired outcome. The local authority buying organisations can also help to bring together demand into a wider collaborative public sector procurement process.

Key opportunities for provision of standard specifications are:

- Construction specifications within BSF, PCP and other building programmes – this could be implemented as soon as possible, in order that the emissions impact of construction is minimised. This would entail:
 - Requiring 25% recycled construction products from 2011 – 2015, increasing to 35% between 2015 and 2020. This would deliver a carbon saving of **185,109 tCO₂e to 2020**.
 - The Eastern Shires Purchasing Organisation (ESPO) already offers products wholly diverted from landfill and from sustainable sources for use on BSF fit out
 - Requiring 30% recycled metal products (through a 3% year on year increase to 2020), which would reduce emissions by **44,292tCO₂e to 2020**.

- Working with supply chain partners in the construction industry to improve their onsite efficiency is also important. This requires close partnership working between schools, local authorities and the supply chain. A 3% annual efficiency improvement from 2011 to 2020 would deliver a **177,255 tCO₂e** saving.
- Chemicals, paints and varnishes are all carbon intensive to produce; reducing their impact by 30% over ten years, through specifications and careful use / reduced wastage would deliver **87,910 tCO₂e** to 2020.

- Food and catering services – in particular, specification options that encourage the procurement of locally sourced food and organic ingredients where the evidence base is clear:
 - Increasing the proportion of organic and locally sourced food procured by schools and through catering contracts to 50% by 2020 would deliver a **61,667 tCO₂e** reduction in emissions.
- Products made from recycled materials, across multiple product categories:
 - Increasing the proportion of recycled paper purchased – to 60% by 2015 and 90% by 2020 – would deliver significant carbon emissions reductions, some **385,205 tCO₂e by 2020**.
 - Working with the supply chain to use more recycled products in furniture (wood, plastics, metal) could deliver a saving of **38,872 tCO₂e** to 2020.
 - Increasing the general uptake of recycled products (in addition to paper and furniture) across a whole school to 25% of purchasing would deliver **77,594 tCO₂e** across the school system to 2020.

- There has been a rapid growth in the quantity of Information and Communication Technology deployed within schools. Efforts to not only stabilise growth, but to reduce the amount of ICT purchased by schools could have a noticeable impact on carbon emissions. Reducing the new purchase of ICT and office equipment purchased or leased by schools by 3% per year to 2020 would deliver carbon savings of **94,209 tCO₂e**.

4.1.5 Product choice and labelling

Schools can access a number of supporting and enabling mechanisms when making procurement choices and it is essential that low carbon product choices are reflected within these.

There is scope for the development of a Sustainable Procurement Code for schools, embedded within the OPEN e-procurement system but also available to purchasers using other channels. A Code would encourage and enable schools to develop policies on environmental standards, recycled content and carbon benchmarks (with initial template policies being produced by DCSF for local customisation).

Across all appropriate procurement categories, we would seek the inclusion of product standards and

benchmarks into specifications, e-procurement tools such as OPEN and product catalogues.

DCSF can work with Defra to identify appropriate standards for frequently used goods and services and, if possible, translate them into guidance in an easy-to-understand format such as A-G labels or a traffic light system. This would make it straightforward for schools to make sustainable choices without requiring specific sustainable procurement expertise.

Product labelling should be prioritised according to those procurement categories which are responsible for most carbon emissions and where viable alternatives are available (along the lines of “quick wins”). Over time, new product categories should be researched and encouraged (through supply chain engagement, see above) to ensure that schools and other buyers can deliver continuous environmental improvements through procurement.

4.1.6 Accreditation of suppliers

As well as product labelling, purchasing organisations and local authorities (and perhaps larger secondary schools) can be encouraged to adopt an accreditation system for their suppliers, which includes environmental criteria. Such a system helps to encourage suppliers to reduce their energy use, which in turn reduces the embodied carbon associated with their products.

Case study - Green ticks

Office of Government Commerce

<http://online.ogcbuyingsolutions.gov.uk/bcm/sustainablesolutions/quickwins/>

The Office of Government Commerce (OGC) works with central Government departments and other public sector organisations to deliver best value from spending. In its online procurement system, OGC provides a ‘green ticks’ system whereby products with specific sustainability credentials (mainly around energy in use) are easily identifiable.

Case study - Green Accord

Exeter City Council

Exeter City Council has produced a Green Accord, which seeks a commitment from companies that supply to the Council, or buy from the Council. A core part of the Green Accord requires a pledge to undertake the Council's Accreditation System. Companies on the Council's Select List that commit more fully to the Council's sustainability agenda will achieve a higher regard than those who do not.

The Council has developed a self-assessment tool to enable potential suppliers to measure their ability to demonstrate environmental technical competence.

To enable all types and sizes of businesses to achieve sustainable goals and Green Accord accreditation, the Council makes available a wide range of information and links in an online Green Directory and provides training to potential suppliers.

Further information is available at www.exeter.gov.uk/index.aspx?articleid=7533.

Case study - Sustainable Procurement Compact

Be Birmingham

Be Birmingham is the Local Strategic Partnership for Birmingham, bringing together partners from the public, private, voluntary, faith and community sectors. The members of the Partnership have combined annual purchasing power of approximately £6 billion, and recognised that this power could be used to encourage sustainable procurement practices across the city.

The Sustainable Procurement Compact was signed in 2008 and provides a code of practice for signatories to make their procurement practices more economically, socially and environmentally sustainable. It can be downloaded at <http://www.bebirmingham.org.uk/page.php?id=84>

4.1.7 Product market development

A body of information and evidence exists to support sustainable (low carbon) procurement by and on behalf of schools. Early activities on specifications, information and communications should focus on categories where the knowledge base is richest and which form a significant part

of the procurement footprint. The box below identifies the Quick Wins currently promoted by Defra as part of their work on Sustainable Production and Consumption, and it is easy to see the correlation with the procurement footprint chart above.

Quick Wins

The Quick Wins were specifically designed for procurers; they are a set of specifications for a range of commonly-purchased products based on environmental / financial impact, scope for environmental improvement and political or example-setting function.

- Paper
- Envelopes
- Cleaning products (dishwasher and laundry detergents)
- Office machinery including computers, monitors, laptops, printers, scanners and external power supplies
- Heating and cooling systems
- Glazing
- Lighting
- Water saving devices such as low flush toilets, sprays / taps, urinal controls and rainwater harvesting equipment
- Wood products
- Paints and varnishes
- Furniture
- Electrical goods such as televisions, set top boxes, fridges, freezers, electric ovens and dishwashers
- Textiles
- Gardening services products

(Office machinery and electrical goods are generally compared in terms of their energy performance in use rather than their environmental impacts in production.)

<http://www.defra.gov.uk/sustainable/government/what/priority/consumption-production/quickWins/index.htm>

Defra is expanding its work on Quick Wins and it may be possible to advance those product categories with the most significant carbon impact for the schools system.

It will also be important to work with the supply chain to stimulate innovation in low carbon product development. For example, purchasing organisations could report to DCSF when there is significant potential for a product (for example, plastic chairs made of recycled or alternative materials). DCSF could scope the market potential for these products and then engage the appropriate trade body to encourage product development to support that particular market. Open competition should be encouraged with a mind to ensuring that new entrants and SMEs have access to development opportunities. Specifications and the OPEN e-procurement system would provide schools with the tools they

need to purchase these newly developed low carbon goods.

4.1.8 Data and monitoring

Data about the carbon impact of what schools buy can be difficult to obtain, particularly where purchasing decisions are made at a very local level. The data used in this analysis is based around spend and, when it is translated into carbon, this produces an average carbon intensity figure for each product type. This top-down data will need to be supplemented by bottom-up data to provide a reasonable picture of change in the schools system.

Various mechanisms for data gathering already exist (see case study below), and it is important to consider which reporting routes are most appropriate for schools. These could include:

- Building carbon reporting into Consistent Financial Reporting
- Accounting for carbon within FMSiS
- Developing a green procurement code, potentially linked to a reward scheme and pupil engagement activities, which would provide data on products purchased and

promote best practice in sustainable procurement

- Building carbon options and monitoring into the OPEN e-procurement system

These ideas are explored further in the Section F, 6.1 – Data and monitoring.

Case study - Green Procurement Code Mayor of London

The Mayor of London's Green Procurement Code is a free support service for London based organisations committed to reducing their environmental impact through responsible purchasing. The Green Procurement Code provides practical advice and support to help embed green purchasing into all aspects of an organisation, including office products, energy, water and transport.

Participants are required to report on an annual basis, using a standard spreadsheet tool, providing information on the amount of recycled goods procured and the amount of waste that they have themselves recycled.

Since its launch in 2001, members of the Green Procurement Code have spent £379 million on green products and diverted 1.3 million tonnes of waste from landfill. In 2006, the purchase of green products resulted in 175,000 tonnes of carbon dioxide savings, the equivalent yearly emissions of over 29,000 households.

5. Initiatives/policies

5.1 Capacity building

Buyers of products and services – whether within schools or in local authorities – need to feel confident in their ability to identify, specify and purchase low carbon products. A widespread programme of capacity building activities would better equip buyers to address sustainable procurement. This should target those within schools and local authorities responsible for the bulk of purchasing decisions (potentially school administrators, bursars, business managers and local authority procurement teams).

It is also important to build capacity at a regional and national level, within the regional Purchasing Organisations and within DCSF.

The regional Purchasing Organisations have an important role to play, and some are already taking steps to reduce environmental impacts.

For example, West Mercia Supplies¹² has worked with schools and the supply chain to limit the frequency of deliveries, reducing freight emissions.

5.2 Communications with schools

An ongoing programme of communications needs to be established with schools, so that they understand the strategic framework outlined above, and can identify the practical things they can put in place to reduce the carbon impact of procurement.

Much of the information available to schools about sustainable procurement (for example, from Sustainable Schools) is related to waste minimisation, recycling and avoided purchases. The conversation needs to extend to cover the carbon associated with the manufacture of

¹² West Mercia Supplies is a Purchasing Consortium owned by four local authorities – Shropshire County Council, the Borough of Telford & Wrekin, Worcestershire County Council and Herefordshire Council.

products and delivery of services, and the opportunities for repair and re-use of assets.

Practical communications activities should initially focus on those product sectors which have a significant carbon impact, and be tailored to the types of goods and services that schools might buy directly (rather than the local authority purchasing them on schools' behalf). A focus on 'quick wins' and sensible practice will help to make sustainable procurement real and achievable for schools, whilst preparing the way for future communications work about product areas that are currently less well understood.

Early options for communications campaigns might include paper and printing, cleaning services, catering services and office machinery and ICT.

Sensible practice communications might include ideas such as reducing the number of deliveries by suppliers to schools or sourcing products locally to reduce freight emissions. Options modelled are:

- Improving food procurement to reduce food waste by 3% per year; this could lead to a reduction in carbon emissions of **106,501 tCO₂e**
- Reducing paper waste, and therefore the amount purchased, by 2% per year could generate a saving of **28,418 tCO₂e** to 2020¹³. The move to a "paperless school", enabled by ICT can help here.
- Purchasing products which have lower transport and distribution impacts, and cutting the numbers of deliveries to schools, could achieve a reduction of **240,682 tCO₂e** across the country. This equates to a 4% year on year reduction in the distance travelled by freight providers.
- Working with cleaning contractors to reduce the amount of wasted product (eg, through overuse of detergents) and to use products with lower carbon

¹³ This saving assumes that the levels of uptake of recycled paper have increased as outlined in 4.1.4 - Specifications.

impacts could deliver a reduction in emissions of **107,926 tCO₂e**

- Service industries offer opportunities for carbon reductions, although these may be harder to realise. The collective purchasing power of schools when selecting banks, insurance companies, accountants is quite significant and there are opportunities to influence those sectors; a 2% annual improvement in their carbon performance over a ten year period would cut the schools' sector footprint by **26,291 tCO₂e**.

Standard specifications and clauses would form part of the suite of communications, but should be accompanied by examples of good practice to make the issues and opportunities real.

A reward system might also stimulate more sustainable procurement among schools, and could offer a route for gathering data about schools' performance (see Data and Monitoring below).

In the medium term, providing schools with a product roadmap would give them an indication of when low-carbon alternatives to existing products are likely to be available.

In some cases, the lower carbon product may carry a higher up-front cost, which can be a barrier for the buyer. Whole life costing is encouraged by Government but not consistently practiced by schools. Training on whole life costing in courses for schools heads, business managers, bursars and administrators, backed up by relevant templates and calculators to simplify costing could help schools to overcome short-term cost barriers.

Opportunities to make links to the curriculum should also be explored; encouraging pupils to consider where products are sourced, how they are produced and their overall sustainability will help to inform the purchasing decisions of future consumers. Science, geography, design and technology and citizenship are all highly relevant to this purpose and links to programmes such as Fair Trade Schools can offer access to resources and support.

5.3 Communications with local authorities

A similar programme of communications activities should be developed for local authorities where they are buying goods and services on behalf of schools. The purchasing power of the local authority, aggregating demand from multiple schools, gives them considerable influence over supply chains.

A focus on quick wins would help to deliver early returns. This could cover cleaning services, catering services and school transport services (buses, coaches, taxis).

A key element for communications with local authorities will be around reducing the carbon impact of school construction and refurbishment through the major capital programmes. Standard specifications and clear guidance about the expected level of recycled construction materials would have a significant impact on emissions during the lifetime of the programmes. A more detailed support and handholding service would help local authorities (and schools participating in BSF or PCP) to understand the low-carbon options that are available to them.

Again, in the medium term, providing local authorities with a product roadmap would give them an indication of when low-carbon alternatives to existing products are likely to be

available. Building capacity in whole life costing would be as beneficial for local authorities as it would for schools.

A key driver for local authorities is their Local Area Agreement, and the broader set of national indicators on which they are judged. Making links to these indicators will help to encourage local authority commitment to supporting sustainable school procurement. For instance, reducing the number of deliveries of goods to schools (eg, from daily, to weekly) helps to cut local carbon emissions from road transport (part of NI 186, reduction in per capita carbon emissions in the local authority area). Encouraging local supply chains can also contribute to local economic development indicators (such as NI 171, the VAT registration rate for new businesses).

6. Category by category savings

The strategic framework and initiatives outlined above provide the context within which schools and local authorities can change their purchasing behaviour and deliver carbon emissions reductions.

The table below gives an indication of the degree of change required to deliver a reduction in emissions of 21.8% compared to a 2004 baseline (or 32.9% compared to BAU position at 2020).

Product category	Change	Carbon saving
Construction	Increased requirement for recycled construction products in BSF (25% to 2015; 35% thereafter)	185,109 tCO ₂ e
Construction	Improved construction industry efficiency on site – 3% annual improvement from 2011 – 2020	177,255 tCO ₂ e
Construction	3% year on year reduction in chemicals, paints, varnishes and soaps	87,910 tCO ₂ e
Construction	Through specifications, increase recycled metal content to 30%	44,292 tCO ₂ e
Food	5% year on year increase in the amount of locally sourced and organic food purchased	61,667 tCO ₂ e
Food	Reduce food waste through more efficient procurement by 3% per year	106,501 tCO ₂ e

Paper	Increase proportion of recycled paper bought to 60% by 2015 and 90% to 2020	385,205 tCO ₂ e
Paper	Reduction in waste - 2% per year to 2020 (savings assume recycled uptake as above)	28,418 tCO ₂ e
Furniture	3% year on year increase in the amount of recycled material in furniture (or recycled furniture items purchased)	38,872 tCO ₂ e
ICT	Reduction in equipment bought or leased by 3% year on year to 2020	94,209 tCO ₂ e
Cleaning	Reduced waste and specification of lower carbon products – 50% saving over ten years	107,926 tCO ₂ e
Freight	Reduce freight by 40% over ten years	240,682 tCO ₂ e
Recycled products	Increase purchasing of recycled products (other than paper and furniture) to 25% by 2015	77,594tCO ₂ e
Service industries, eg, banks, insurance	2% reduction in emissions year on year from 2011 to 2020	26,291 tCO ₂ e
Total		1,661,931 tCO₂e

7. Comparison of costs and carbon

The chart below outlines the key policy options for reducing carbon emissions from school procurement. As these options relate to creating a strategic framework for individual decisions (at

school or local authority level), it is more challenging to ascribe carbon emissions to each action. The previous table shows the types of changes in purchasing behaviour across product categories that might be required to deliver the overall carbon saving figure.

Policy	Carbon reduction by 2020	Relative additional cost	Relative financial benefit
Sustainable procurement strategy including product roadmap		£	££
Capacity building within DCSF to lead and support the schools sector		£	£
Supply chain engagement		£	£
Standard specifications		£	££
Product standards and labelling		££	££
Encourage supplier accreditation		£	£
Product market development		£	££
Capacity building in schools and local authorities		££	££

Communications programmes with schools and local authorities		££	££
Total carbon saving	1,661,931 tCO₂e		
Percentage reduction on 2004	21.8%		
Percentage reduction on 2020	32.9%		

8. Research

There is still a research and data gap associated with bottom-up information about how individual schools make purchasing decisions and what products and services are being bought. There needs to be an understanding of changes in behaviour at school level if we are to identify why emissions are reducing (or increasing) over time.

Section F: Implementation and delivery

1. National delivery

1.1 A vision for national coordination of carbon reduction activities

It is important to have a clear vision of how schools carbon reduction activities will be coordinated and delivered. Individuals and organisations across the school system need to be engaged with and take action to reduce emissions.

The following sections outline the potential roles of central, regional and local government and of schools in delivering deep cuts in carbon emissions.

1.2 The role of DCSF

1.2.1 A catalyst for carbon reductions

The central Government role would be to act as a catalyst for carbon reductions by creating an enabling environment for school and local authority action. In its work with local authorities, DCSF would use appropriate policy levers and supportive guidance, but this should be coupled with allowing local flexibility of delivery, for

The development of the strategic framework (above) carries some research requirements:

- Identification of priority product groups to inform specifications and a Sustainable Procurement Code
- Carbon emissions modelling of different product categories (working with Defra)
- Scoping the potential market for alternative products to help inform supply chain engagement work

example, clustered approaches by local authorities to a portfolio of schools.

Schools need to be empowered and enabled to take action at an individual level. This means integrating carbon reduction in policy making, ensuring key system organisations such as the TDA, NCSL, QCA, Ofsted and Becta are doing everything within their power to promote carbon reductions, and otherwise supporting action in schools and local authorities.

1.2.2 Future policy development

There is often a direct link between policy development and carbon emissions, not always in a favourable direction. The refurbishment of much of the schools estate brings about an increase in construction-related emissions; the drive to equip our schools with ICT has increased building emissions. These policies do, however, deliver wider educational benefits.

The carbon impact of future new policies and initiatives needs to be taken into consideration, through structured and consistent impact assessments, with a view to minimising any negative impact or seeking reductions elsewhere in the footprint to counteract any increases. This can be managed within the wider context of carbon budgets.

2. Regional delivery

Regional government bodies – Regional Development Agencies and Government Offices - have a notable part to play in the delivery of this carbon management plan. Their oversight of transport and infrastructure issues, regional energy targets and their interest in the development of regional/local supply chains for economic development all link in to the work that this plan aims to stimulate.

Much positive work is already under way at regional government level in facilitating and coordinating activity to deliver Sustainable Schools. This role could be strengthened through support to make carbon reduction a specific focus of regional schools activity. Regional government could develop, maintain and maximise support networks for local authorities and schools, and to collect and share good practice, both within and between regions.

Carbon reduction should also be embedded in existing channels for communication at regional and local level, for instance, the Educational Procurement Centre programme, which provides schools with support and skills to encourage more sustainable procurement practices and better

contract management. Equipped with the right information, the Local EPCs can provide more detailed on-the-ground advice and information to schools on low carbon procurement.

3. Local delivery

Local authorities can play a pivotal role in initiatives to reduce carbon emissions in schools in their local areas. Local government has multiple roles beyond this: supporters and facilitators of policy change, providers of financial and human resources, owners of expertise and coordinators of different strands of activity.

3.1 National indicators

There are a number of national indicators for local authorities which would benefit from emissions reductions from schools, notably:

- **National Indicator 185 – Percentage CO₂ reduction from local authority operations**

Within NI 185, local authorities will gather data about schools use of energy. Authorities will have the choice of where in their estate (including schools) to take action to reduce emissions; however, some authorities have a significant schools estate so NI 185 is likely to drive action on energy-related emissions.

Case study - Sustainable Schools Coordination Group Government Office for Yorkshire and the Humber

The regional Government Offices are charged by DCSF with promoting sustainable schools at a regional level through networking good practice, as well as locally through improved support and helpdesk functions for schools. Government Office for Yorkshire and the Humber (GOYH) has established a Sustainable Schools Coordination Group to help fulfil this objective. The Group facilitates sharing of good practice within and across DCSF Sustainable Schools doorway themes, helps connect schools in the region with organisations engaged in sustainable development, advises and challenges schools and other organisations as they develop their Sustainable Schools programmes, and signposts funding and support opportunities for Sustainable Schools activities.

- **National Indicator 186 – Per capita reduction in CO₂ emissions in the local authority area**
This indicator encourages emissions reductions from energy use and road transport across a whole local authority area. Emissions reductions from schools therefore count towards this indicator. Schools projects which set an example to the wider community (eg, walking or cycling promotions) can form a valuable element of NI 186.
- **National Indicator 194 - Air quality - reduction in NO_x and primary PM₁₀ emissions through authority's estate and operations**
As with NI 185, schools are included in the definition of a local authority's estate and operations, and hence covered under NI 194. Improving air quality – by reducing road traffic congestion and car usage – also helps to reduce carbon emissions in from schools.
- **National Indicator 198 – Children travelling to school – mode of travel usually used**
Again, action to improve performance on NI 198 will help to enable sustainable travel choices, reducing private car usage and associated emissions.

These indicators are a driving force for action within a local authority; however, it is important to note that local authorities will make their own decisions on where to invest and may focus on their own buildings – town halls, council offices etc – rather than deploying measures in schools. There needs to be a consistent and targeted programme of communications and support to local authorities, to enable them to identify and maximise the opportunities available for working with schools in their areas.

3.2 Carbon Reduction Commitment

From 2010, most local authorities will be participating in the Carbon Reduction Commitment, a mandatory, national carbon trading scheme. Schools are considered part of the local authority estate for this purpose and will

be required to provide data to their local authority about their energy consumption. This is likely to be on an annual basis, and schools can request an annual energy statement from their energy suppliers to help compile their data.

Defra has recently published guidance on the Carbon Reduction Commitment, which outlines the required approach for compiling energy data. Local authorities have a role to play in working with schools to build this data set and in developing strategies for carbon reduction that maximise the opportunities presented by the school estate.

3.3 Procurement

Local authorities can also directly deliver some of the carbon savings identified in this strategy, through their aggregated procurement role on behalf of schools. Many local authorities manage significant contracts for schools in their areas, so recommendations geared at reducing procurement emissions should target local government as a key audience.

3.4 Options for local delivery

There is a significant track record of local and regional support on certain issues (eg, school travel) and there is a great opportunity to build on this by supporting the creation of **Schools Carbon Reduction** posts or resources within local bodies.

Local support is an effective model for encouraging change, as the School Travel Adviser precedent indicates. Taking a top-down approach to each locality means that opportunities for coordination and aggregation will become apparent, whilst each school can still receive the individual and tailored service that it needs.

A schools carbon reduction function could:

- Work with schools to develop and implement carbon reduction plans. A planned approach helps each school to tackle those emissions areas which are most significant and over which the school has most influence – this will vary from school to school depending on how finances are structured and the types of

services that are bought in by the school or contracted through a local authority

- Build capacity within the local authority and the local area
- Help local authorities to realise opportunities for CO₂ reductions from the schools estate, thus contributing to local authority performance indicators
- Bring in additional expertise and resources to work with schools, and share experience and good practice across an authority's schools (and with other authorities)
- Work across the Sustainable Schools strategy agenda to bring benefits across wider sustainability issues alongside carbon reductions

Each local authority area is different and decisions about resources should be made locally to suit circumstances. An outcome specification would accompany the funding, providing a clear performance management opportunity.

4. The role of schools

Schools are both the beneficiaries of this strategy but also key participants in its delivery. Almost every policy or initiative identified in this proposal ultimately requires someone at school level to decide to do something differently.

4.1 Carbon reduction within school objectives and development plans

School plans and school profiles provide an excellent route for embedding sustainability and carbon reduction objectives into the guiding ethos of the school. This helps to ensure continuity (eg, if there is a change of school leadership) and to communicate to existing and potential parents, pupils, governors and other stakeholders that the school is committed to taking action to minimise its carbon impact.

As part of the wider drive towards Sustainable Schools, schools could be encouraged to adopt a carbon reduction objective. Supplementing this with regular carbon footprinting (with the help of the local carbon reduction support service) will help schools to track their progress against this objective and can provide valuable evidence of the broader performance of the school for inclusion in the school profile, in completing the Sustainable Schools Self-Evaluation tool and in providing information to Ofsted and the local authority.

4.2 Links to the curriculum

It is clear that there are significant links to the school curriculum related to a school-wide effort to reduce carbon emissions. Whilst these links have not been a major feature of this carbon management plan, schools should see sustainability and carbon reduction as learning opportunities.

Case study - Energy Saving Trust Advice Centres

There are many options for the delivery of local support. One model for consideration here is the Energy Saving Trust's network of Advice Centres. There are twenty-two centres around the UK operating at regional or sub-regional level and providing dedicated support to local authorities and householders on energy and road transport issues. Their service has recently expanded to include signposting to further advice on waste minimisation and water efficiency.

As well as the more obvious subjects for teaching sustainability and carbon reduction – such as Geography, Science, ICT or Design and Technology – it can also be used as a topic area in other subjects. For example, Citizenship prepares pupils to be functional, responsible citizens and could include policies and practices for sustainability and their impact on the environment. Within English, while there are no specific environmental or sustainability strands, there is scope for using environmental topics for writing, reading, listening and speaking skills, as much for any other topic.

Pupil engagement in carbon reduction activities helps to build awareness and behaviours which should influence their decision making in later life. It can also help to encourage young people to consider developing skills in environmental sectors, stimulating the green economy in the longer term. Children and young people are also great watchdogs, and take pride in being able to identify where the behaviour of others – particularly teachers – is falling short. Simple schemes whereby pupils monitor the amount of ICT equipment or lighting used or left switched on at the end of the school day, and then “police” the teachers, are both engaging and effective.

An informed group of pupils can also be engaged in quite complex debates, for example, what are the carbon impacts of an overseas trip to be taken by the school? How do they compare to the educational and cultural impacts of that trip? Bringing carbon to the forefront of people’s discussions can help to address some of these more difficult issues at a school level, rather than through a top-down solution.

4.3 Capacity and skills

Achieving the desired carbon reductions across energy, travel and procurement emissions demands a great deal from individual schools and from local authorities. Dedicated capacity building programmes are needed to ensure that messages reach people – there is a need to move beyond simply making information available to those who are interested, to a more structured requirement for sustainability (including carbon reduction) to form a core part of each person’s role.

It is also important to ensure that we do not add to the work and time burdens already faced by many people working within schools. Capacity building programmes need to provide the appropriate level of support to enable individuals to make decisions which will help to reduce emissions, whilst not requiring them to become technical experts. Much of this capacity building work will be about building persistence in behaviour change (for example, continuing to use building energy management systems in an efficient manner once programmed by an energy expert; or continuing to seek out low carbon product options after a training course on sustainable procurement).

4.3.1 School leaders and teaching staff

Embedding carbon reduction and sustainability into the work of the National College for School Leadership and the teacher training colleges will help to ensure that key school decision makers have an appreciation of their role in reducing carbon emissions and an understanding of how carbon reduction plans are developed and implemented. This dovetails with the carbon reduction support that would then be available to them within their local authority area.

4.3.2 Site staff, including managers, caretakers, technicians and technical support

Site staff are crucial to the operational efficiency of schools. They are often at the heart of decisions about how energy is managed on a day-to-day basis (for example, management of ICT systems) and how repairs and maintenance work is carried out (for example, replacing a broken window). Likewise, where their role encompasses school grounds, they have a significant influence on allocation of space for recycling facilities or school gardens.

Site staff are not required to have any specific qualifications (although NVQs are available to them), and are often on relatively low incomes. Communications channels are fragmented and time is a valuable commodity.

Support from the local carbon reduction support service will help to bring site staff together to share their experiences and develop their understanding of their role in reducing emissions

by operating the school more efficiently. Identifying “champions” among the caretaker community can help to overcome resistance or doubt about the value of environmental projects, and it may be worth exploring with local authorities ways in which performance improvements can be incentivised, for example, through bonuses.

4.3.3 School governors

School governors should be encouraged in the first instance to make sustainability (including reducing carbon emissions) an objective of their school. Close links will need to be made to the role of governors in ensuring that a school is run to promote pupil achievement and that governors understand how carbon reduction supports their work in overseeing school budgets and stewardship of school buildings. A clear programme of information, training and support could be delivered through governor support services and the National Training Programme for New Governors.

4.3.4 Bursars and business managers

Capacity building activities should enable bursars and business managers to take account of carbon impacts in their decision making. At a minimum this should entail increasing knowledge of the environmental impacts of schools business and widespread provision of training and tools to enable the use of whole life costing methodologies.

4.4 Management information systems

4.4.1 Financial Management Standard in Schools (FMSiS)

FMSiS is a standard which all schools are required to meet (by March 2010); it provides assurance to local and central government that schools have adequate arrangements in place to manage their budgets and finances effectively.

FMSiS helps to build consistency in how schools manage their resources, whilst still allowing schools flexibility in decision making. To meet FMSiS, schools have to demonstrate that they are meeting 18 different criteria across five areas (Leadership and Governance, People Management, Policy and Strategy, Partnerships and Resources and Processes).

Potential alignments between FMSiS and carbon reporting are:

- 4.2 – The School has procurement arrangements in place to secure value for money from all suppliers including the LA and outside contractors
- 5.3 – The School complies with Consistent Financial Reporting on a timely basis.

At present, the guidance notes accompanying FMSiS only occasionally allude to environmental issues (eg, S4.4 Managing Premises discusses the financial, educational, motivational and image benefits of good premises management). Definitions of best value and value for money are limited and link to guidance dating back to 2002.

There are opportunities to strengthen the FMSiS framework to make environmental considerations more explicit. This will help to raise awareness of the links between schools spending decisions and carbon emissions, influencing school management and governors.

4.4.2 Consistent Financial Reporting (CFR)

To demonstrate compliance with FMSiS, schools need to comply with CFR reporting requirements on a timely basis. The table below shows some of the main headings of CFR and their alignment with major elements of the carbon footprint.

Revenue expenditure	
E01 Teaching staff	
E02 Supply teaching staff	
E03 Education support staff	
E04 Premises staff	
E05 Administrative & clerical staff	
E06 Catering staff	

E07 Cost of other staff	
E08 Indirect employee expenses	Potentially includes fuel for business travel (8% of footprint, 21% of travel and transport)
E09 Development and training	
E10 Supply teacher insurance	
E11 Staff related insurance	
E12 Building maintenance and improvement	Would contain an element of construction work (non-capital)
E13 Grounds maintenance and improvement	
E14 Cleaning and caretaking	Cleaning – 5% of procurement footprint
E15 Water & sewerage	
E16 Energy	Energy – 41% of total footprint
E17 Rates	
E18 Other occupation costs	
E19 Learning resources (not ICT equipment)	
E20 ICT learning resources	
E21 Exam Fees	
E22 Administrative supply	Paper and printing – 12% of procurement footprint
E23 Other insurance premiums	
E24 Special facilities	
E25 Catering supplies	Food – 12% of procurement footprint
E26 Agency supply teaching staff	
E27 Bought in professional services – curriculum	
E28 Bought in professional services – other	Business and financial services – 4% of procurement footprint
E29 Loan Interest	
E30 Direct Revenue Financing (Revenue contributions to capital)	
E31 Community focussed extended school staff	
E32 Community focussed extended school costs	
Capital expenditure	
CE01 Acquisition of land and existing buildings	
CE02 New construction, conversion, and renovation	Construction – 19% of procurement footprint
CE03 Vehicles, plant, equipment and machinery	Motor vehicles (not rented) – 11% of transport footprint
CE04 Information and communication technology (ICT)	8% of procurement footprint

Other large elements of the footprint, which are more difficult to allocate to CFR categories are:

- Chemicals – 5% of procurement footprint
- Metal – 3% of procurement footprint
- Furniture – 3% of procurement footprint

It is important to remember that pupil and staff travel are not paid for by the school and therefore are not reflected in schools' financial management systems.

4.4.3 School budgets

Schools that are part of local authority procurement systems have to fill in quite detailed budgets, including a breakdown of different expenditure categories such as gas and electricity. Other schools can use their own methods or spreadsheets, so long as they comply with FMSiS. Budgets are often broken down by purpose or function of spend rather than by product or service bought.

A carbon budgeting tool would help schools to identify the likely carbon impacts of their spending plans for the coming year. Energy, again, presents the easiest option, with forecast spend on gas and electricity being converted into carbon emissions. Becta has developed an ICT electricity use comparison tool for use by schools¹⁴. For major procurement categories – eg, paper – schools could identify the carbon impact of their spend and test different scenarios for recycled paper purchasing.

Placing carbon within school budgeting helps to raise awareness and build ownership at a strategic level within a school. However, we recognise that information provided without context or explanation can do more harm than good. Carbon budgeting should only be considered if it is aligned with training or capacity building, or with the provision of a local support service to ensure that data and analysis are interpreted effectively.

¹⁴ See http://schools.becta.org.uk/index.php?section=re&catcode=ss_res_env_02&rid=16075

In addition, the current structure of school budgets may not lend itself to a carbon budgeting approach. Integrating carbon with a purchasing or invoicing system may be more effective for identifying the carbon impacts of products and services being purchased, both at school level and in aggregate.

4.4.4 Embedding carbon in FMSiS and CFR

FMSiS is being reviewed in 2009; this includes consideration of a FMSiS Plus standard, an aspirational standard for better performing schools.

One option is that basic FMSiS could encourage accounting for carbon from energy use. This could be achieved by embedding a simple carbon calculator function within FMSiS and CFR templates, whereby spend on electricity and gas (or data on kWh purchased) could be automatically converted to carbon emissions. This data could then be used by the school to identify its own energy emissions, by the local authority in benchmarking across schools, and by DCSF in taking the national overview.

A potential FMSiS Plus could encourage more overt carbon accounting, for example, by asking finance managers to specify the amount or proportion of recycled or low carbon goods that they have purchased in the major categories within CFR where the carbon calculations are based on robust data.

5. Funding

Every effort should be made to ensure that existing funding streams deliver carbon reductions as far as possible. For instance, strengthening specifications within existing capital programmes to demand higher standards of energy performance will help reduce emissions from energy use in buildings.

Historically, much activity has been grant-based, for example, capital grants for travel facilities or renewable energy installations. Whilst there is a place for capital funding (for example, in stimulating uptake of renewable energy), there is also a place for more innovative and partnership based approaches to funding carbon reductions.

There are already exciting models emerging for delivering carbon reductions in schools through leveraging private sector funding. These are perhaps most mature in the energy sector, where the cost and carbon returns are best understood. A thoughtful approach to energy management in schools would encourage them to adopt a more strategic long-term approach to their energy requirements, while delivering effective risk management of energy costs in a volatile energy market (see Section C – Reducing emissions from energy use in school buildings).

The challenge is to enable the public and private sectors to work together to deliver the most effective local solutions, whilst also ensuring that schools across England have the opportunity to benefit from comparable funding and support schemes.

6. Governance and monitoring

6.1 Data and reporting

6.1.1 Schools carbon footprint

This carbon footprinting exercise could be repeated on a periodic basis to provide a top-down overview and to help identify major trends across the sector. This would demonstrate consistency in approach with the original footprint and take account of emissions across the whole footprint.

However, whilst the carbon model can provide that helicopter view, it does not reveal what schools are doing on an individual, local or regional basis and may need to be supplemented by bottom-up data as outlined below.

The data sets outlined below could be used to develop annual progress reports, which can be monitored over time. Many of these data sets will only be available to DCSF in aggregate at national or local authority level and it may be necessary to establish a long-term data strategy which identifies how school level data sets can be managed.

6.1.2 Energy data

Energy use data for schools has to be collected by local authorities and included in their reporting for National Indicator 185 (Percentage CO₂ reduction from local authority estate). At a minimum, data provided would be energy type and use in kWh (from billing data). Data could also include floor area, % renewable electricity and number of people on site (some of this information will already be known to local authorities; other data is provided voluntarily and designed only for use to help Defra with benchmarking).

NI 185 data for each year is submitted in the July of the following year (ie, data for carbon emissions for 2009-10 is reported to Defra in July 2010) with Defra compiling and publishing its reports in December of that year.

Some challenges remain with NI 185 data as a source of information for schools carbon reporting. Data is input into the NI 185 spreadsheet on a building-by-building basis (ie, School 1, School 2, Town Hall, Leisure Centre). However, the output reports amalgamate all buildings together into one overall energy/carbon figure. It is unclear whether the schools data could be disaggregated from the overall figure without going all the way back to school by school information.

6.1.3 Travel and transport data

The existing suite of DCSF school census data can be used for pupil travel reporting, with relatively straightforward calculation of carbon emissions associated with journeys of different modes and distances.

There are some significant data gaps related to travel and transport, however. There is no specific data about staff commuting, although some schools are starting to include staff travel in their School Travel Plans. Nor is there data about the extent of travel on school business during the day (eg, travel between school sites by staff and pupils, school trips and excursions etc). These issues are addressed in Section D – Reducing emissions from school travel and transport.

In the absence of specific data about staff travel, proxy indicators from National Travel Survey data can be used (as in the original modelling); however, these are based on generic commuting modes/distances which may not accurately reflect schools staff behaviour.

Where pupils are travelling to and from school by car, no account has been taken of the ongoing journey made by the car driver. This data could prove useful, particularly to organisations (such as DfT or local authorities) that wish to offer personalised travel planning services to families or households.

6.1.4 Procurement data

Procurement data is more difficult to compile at this time, as schools are not required to provide information on what goods and services they are buying (aside from the financial spend information within FMSIS).

In the short term, the most straightforward approach to reporting of procurement activity is to continue update the SDC footprint model on an annual basis. This provides a consistent top-down view of activity across the sector, including its overall direction of travel.

The SDC/SEI model does not, however, provide us with on-the-ground information about what schools are actually purchasing or how behaviour is changing at a local or regional level. To overcome this, additional data options should be explored, including Consistent Financial Reporting and the OPEN e-procurement system.

Consistent Financial Reporting provides benchmark spend per year by different types of schools (covering both capital and revenue expenditure). Again, it provides a sense of how much is being spent in each category and could be developed to offer more detailed information about the end products being purchased.

The OPEN purchasing framework and the regional buying organisations could help to provide aggregate data about products that are being purchased by schools and local authorities. Encouraging schools to use these routes for procurement will help to increase the data that is

available for carbon reporting.

6.1.5 Proxy indicators

Alongside these data sets there are some proxy indicators which could be monitored to provide a sense of general carbon reduction activity across the schools sector (and which may in themselves be sources of data). This would include monitoring uptake of initiatives such as the Carbon Detectives Kit and Eco-Schools as proxies for activity by schools to reduce carbon emissions. Data can also be gathered from network based ICT power management tools providing an insight into hours of use of ICT equipment.

The Sustainable Operations on the Government Estate targets provide a series of indicators used by central Government departments to monitor progress on improving sustainability. Whilst these targets do not apply to schools, their structure could provide useful proxy indicators as to progress (assuming data availability). For example, adopting the SOGE approach of measuring energy efficiency per m² would help DCSF to compare the relative performance of different types of schools. It could be aggregated nationally by bringing together DCSF floor area data and emissions data from local authorities under NI 185.

7. Support and information sharing

7.1 National coordination

The support that is available for schools is fragmented across hundreds of agencies, charities, parts of government, consultancies and companies, including national agencies like the Carbon Trust and Energy Savings Trust. Whilst much of this support is of excellent quality, and has been instrumental in delivering carbon reductions from schools to date, there is a need for improved national coordination to ensure that appropriate, high-quality support services are available to all schools across the country and across their carbon footprint.

Close working between central and regional government on this issue could help to map the current availability of support and identify gaps in geographic coverage or footprint areas.

Throughout, it is important that guidance, information and campaigns meshes with the DCSF's National Framework for Sustainable Schools to maintain consistency of messaging; and that carbon reduction activities are made visible through the curriculum and to the wider communities that schools serve.

Annex A: About the GHG emissions model

1. Introduction

This annex provides an introduction to the work undertaken by the Stockholm Environment Institute (SEI) to develop the schools carbon reduction scenario tool that underpins the modelling contained herein. The annex consists of background information about the evolution of the model, a summary of activities undertaken in its development and a description of the model itself.

2. Development of the schools carbon footprint

The Scenario Model for Carbon Reduction in Schools Tool was developed by the Stockholm Environment Institute (SEI) for the Sustainable Development Commission (SDC). The purpose of the tool is to examine the effect of different policy options over the next 50 years aimed at reducing carbon dioxide emissions. In order to create scenarios of different policy options, a large amount of data is required and assembled within the tool.

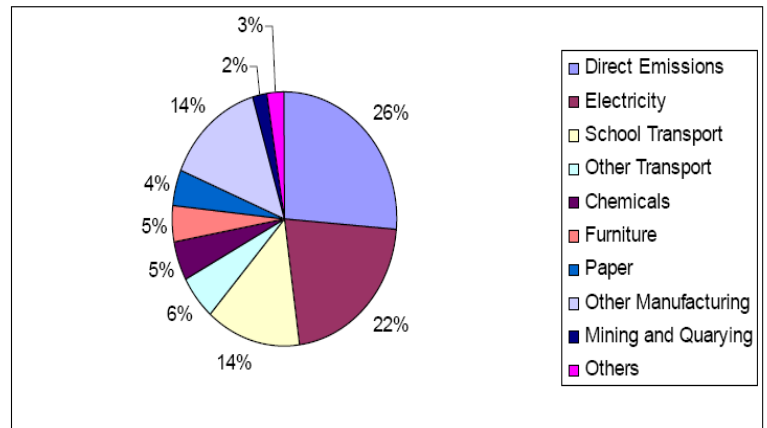
In 2006, the SDC commissioned SEI – working with Global Action Plan (GAP) and Ecologica - to produce a breakdown of carbon emissions for the education sector based on a hybrid approach using a top-down and bottom-up approach. The key results are shown in below¹⁵.

3. Development of the model

In 2007, the SDC commissioned SEI to develop a model which would enable future policy scenarios for the education sector as a whole to be investigated. For this project the calculation included an assessment of:

- Direct emissions from school buildings and equipment
- Transport emissions from commuting of staff and pupils to/from schools
- All embodied (lifecycle) emissions of the goods and services consumed in schools

Schools carbon footprint broken down according to major consumption categories (Global Action Plan, SEI and Ecologica, 2006)



¹⁵ Global Action Plan, SEI and Ecologica. 2006 UK Schools Carbon Footprint Scoping Study for the Sustainable Development Commission