



waste

WATCH

Resource management in the education sector

key findings from a study

Waste Watch

Waste Watch is the leading UK environmental charity promoting sustainable resource use. Waste Watch campaigns through policy development for all areas of society to reduce, reuse and recycle whilst working on changing attitudes and behaviour through projects and services in

- communications
- education
- information
- research

Waste Watch is an independent not-for-profit organisation funded by charitable trusts, the corporate sector, individuals, local authorities and the national lottery.

Waste Watch has over 10 year's experience of waste education, and works with schools throughout the UK, through Cycler and Schools Waste Action Club (SWAC). These education outreach programmes have both proved successful in raising awareness, changing values and attitudes towards waste issues and helping schools take action to reduce their waste. For more details about our projects, education resources and training visit www.wastewatch.org.uk and www.recyclezone.org.uk

Biffaward Programme on Sustainable Resource Use Objectives

This report forms part of the Biffaward Programme on Sustainable Resource Use. The aim of this programme is to provide accessible, well-researched information about the flows of different resources through the UK economy based either singly, or on a combination of regions, material streams or industry sectors.

Background

Information about material resource flows through the UK economy is of fundamental importance to the cost-effective management of resource

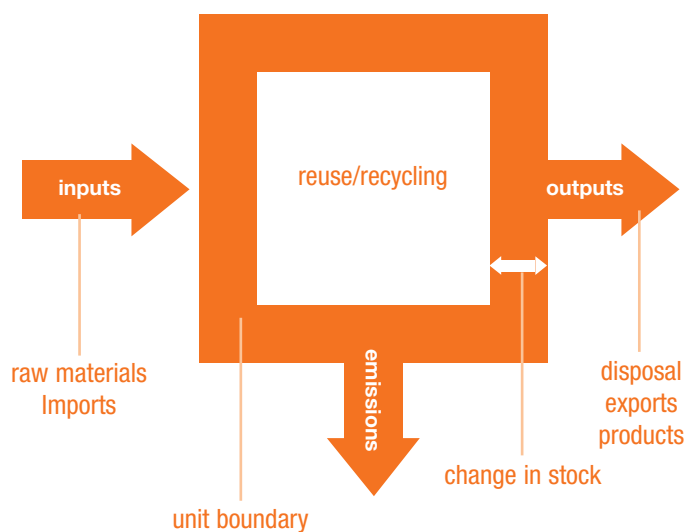
flows, especially at the stage when the resources become 'waste'.

In order to maximise the Programme's full potential, data will be generated and classified in ways that are both consistent with each other, and with the methodologies of the other generators of resource flow/ waste management data.

In addition to the projects having their own means of dissemination to their own constituencies, their data and information will be gathered together in a common format to facilitate policy making at corporate, regional and national levels.

More than 30 different mass balance projects have been funded by Biffaward. For more information on the Mass Balance UK programme please visit www.massbalance.org

figure 1 mass balance diagram



source www.massbalance.org



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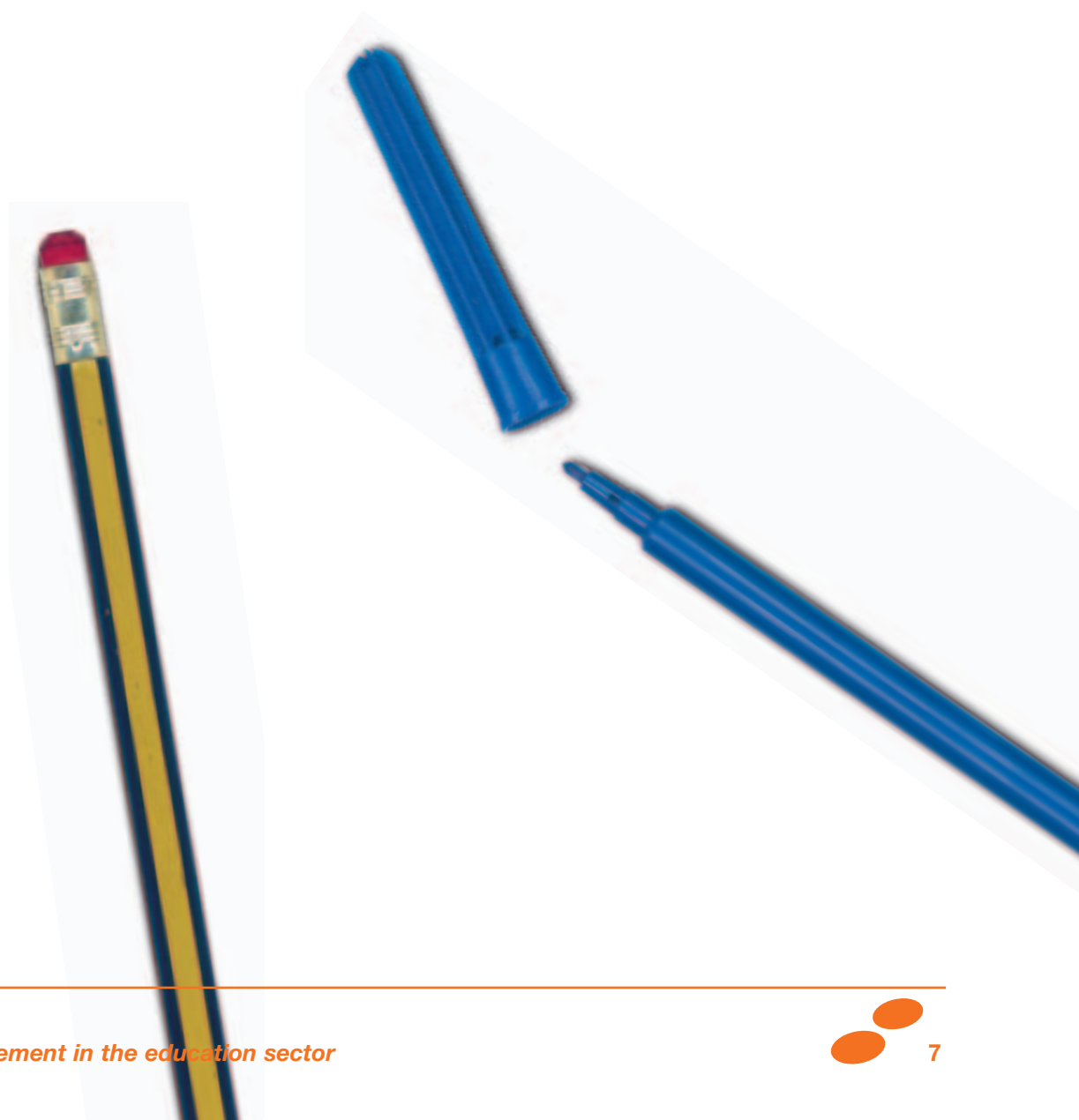
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synopsis

The environmental impact, or footprint, of the education sector is of interest to a number of stakeholders, including staff and students in education, as well as to environmental and educational policy makers.

There are many initiatives which aim to promote sustainable development in schools, colleges and universities, including initiatives to assess the sustainability of the sector and in September 2003 the Department for Education and Skills (DfES) launched the Sustainable Development Action Plan for Education and Skills.

Teaching about environmental issues has always been statutory in the national curriculum, and teaching about sustainable development has been statutory in science, geography, citizenship, design and technology since 1999. The statement on the values, aims and purposes of the curriculum includes the following 'the school curriculum should develop [pupils'] awareness and understanding of, and respect for, the environments in which they live, and secure their commitment to sustainable development at a personal, local, national and global level' (national curriculum 1999). However, there are questions as to whether schools actually meet these requirements.

National and European legislation has also helped to encourage improved environmental performance in the sector. The introduction of legislation such as the climate change levy and landfill tax has prompted the sector, particularly the further and higher education (FHE) sector, to adopt a more sustainable stance towards resource use. In addition, other environmental and social drivers discussed in more detail later in this report are also playing a key role in fostering sustainable resource management in the education sector.

The sector's main environmental impacts arise through organisational policies and operational activities in terms of the purchase, use and

disposal of resources. Of the main operational activities, the impact and cost of energy and water consumption has been documented widely; for example, energy and water benchmarks for government maintained schools in England have been made available annually by the DfES for the past five years. Such practices have meant that the sector has reliable, practical information to refer to when implementing practices to improve energy efficiency and minimise water usage. This study found that resource use and waste production in the sector is very significant; for example, based on figures extrapolated from the study's findings the education sector's energy use produces approximately 5.45 million tonnes of carbon dioxide (CO₂) per year and the sector disposes of 615,117 tonnes of waste.

Objective 3.1 of the Sustainable Development Action Plan for Education and Skills encourages the disclosure of information on environmental performance through assessments for sustainability. This study plays a vital role in building on this work, as a key element of it is devoted to assessing the sustainability of the whole sector to help it to operate to the 'highest environmental standards'¹.

This study concludes that although good progress has evidently been made, there is still considerable potential for further environmental improvement in education, especially considering the size and scale of the sector in the UK. For example, although it has been widely acknowledged that action is required to address other elements of resource management in the sector, waste generation and disposal has been recognised less extensively. This important area is one which, if managed correctly, can also contribute significantly to environmental improvement and financial efficiency. In addition, with over 13 million students in education every year in the UK, the potential for raising awareness of sustainable resource use is huge.

¹ DfES (2003) *Sustainable Development Action Plan for Education and Skills*, DfES



Through this study of schools, further and higher education institutions (FHEIs) across the UK, an insight has been made into resource management in the education sector. Specifically, the study looks at environmental management, purchasing, energy and water use, the use of other physical resources and waste. Throughout the study, staff and students have been engaged positively with environmental issues encouraging them to develop more sustainable personal behaviour patterns.

This study is part of the Biffaward Programme on Sustainable Resource Use. The programme uses mass balance analysis, which is based on the principle that 'the mass of inputs to a process, industry or region equals the mass of outputs as

products, emissions and wastes'². The methodology used to undertake this analysis involves developing a dataset which records resource use patterns to allow for an assessment of the effect of EU and UK drivers designed to encourage resource use efficiency.

This report identifies key aspects of resource usage in the sector whilst highlighting examples of best practice and innovation alongside practical advice and recommendations. It is hoped that the report will be helpful in encouraging greater resource efficiency in the UK education sector.



² Royal Society for Nature Conservation (RSNC) (2001) *Mass Balance UK – Mapping UK Resource and Material Flows*, RSNC

1 – key conclusions

The key conclusions from this study are outlined below

- 83% of all establishments that took part in the survey were involved in national or local environmental initiatives
- staff time, awareness and funding were cited as being key barriers to improved environmental performance
- the most commonly cited barrier to buying recycled products across the whole sector was cost
- on average, primary schools buy less processed and packaged foods, compared to secondary and FHEIs
- FHEIs use more gas per student than primary and secondary schools, but use similar amounts of water per student as secondary schools (with primary schools using less)
- based on figures extrapolated from the study's findings the education sector produces approximately 5.45 million tonnes of CO₂ per year
- on average, 21 kg of waste is generated each year by every student in primary and secondary schools, if extrapolated to include the FHE sector this works out at 615,117 tonnes of waste produced by the whole sector every year
- 55% of all the sites surveyed recycled some of their waste
- the average recycling rate based on establishments that recycled was 32%
- over half of the weight of waste analysed in detail from all establishments was made up of recyclable paper and cardboard
- 72% of schools waste was disposed of at landfill sites
- on average, primary schools produce less of all types of waste per school than secondary schools
- rural schools produce less waste per student than urban ones
- schools which assign more significance to waste related issues such as litter reduce the amount of waste they produce
- colleges and universities produce more waste per student than schools, although a higher proportion is recycled

The importance of efficient resource management in the education sector is being increasingly recognised and addressed at both a micro and macro level. As discussed in more detail in section 6 economic, social and environmental drivers will continue to encourage more sustainable resource management in the sector. Subsequent sections of this report also provide some useful advice about how these drivers can be harnessed proactively to benefit the sector both internally and externally.



2 – methodology

To ensure that the range and number of sites audited were as representative as possible of the education sector, advice was sought about a sampling framework from a statistician at Imperial College and an advisory panel consisting of influential organisations affiliated to the education sector.

The sampling plan intended to permit the following

- provide estimates of the annual production of waste and energy consumption by education facility type
- evaluate whether there are differences in production/consumption and also in waste output/energy consumption between regions across the UK
- evaluate the extent to which waste production/energy consumption are related to other characteristics of a facility such as numbers of students, staff, floor space and location

Using this sampling framework, Waste Watch environmental consultancy collected data for this study through a process of environmental auditing carried out between September 2003 and July 2004.

A total of 96 organisations participated in the project including 51 primary schools, 23 secondary schools, nine colleges and 13 universities. Over 300 staff and 600 pupils were involved in the project. In recruiting the establishments, the benefits of taking part in the project were pointed out. These included cross-over with the curriculum (eg citizenship), raising awareness of environmental issues, recommendations on how to reduce their environmental impact and cost saving potential.

The range of audited sites corresponded to a wide cross-section of the sector, and sites varied according to location, size, staff number and funding status. Table 1 shows the great variation in the participating establishments in terms of size.

To ensure that data was collected from a representative sample of the education sector a stratified quota sample was used, ie sites with different characteristics approximately proportionate to their numbers in the UK were audited as displayed in figures 2 and 3. As shown almost 70% of the establishments surveyed were in an urban location (fig 2), and 87% were government maintained (fig 3).

figure 2 location of surveyed establishments

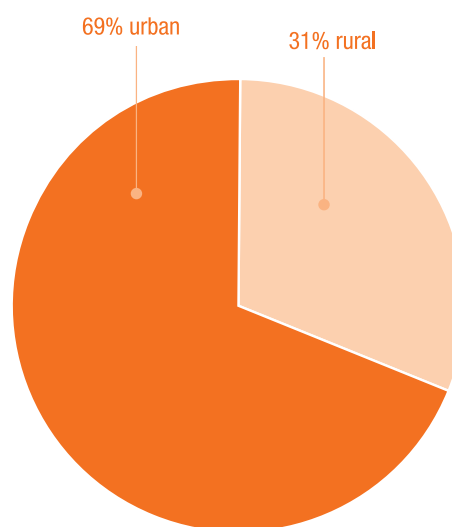
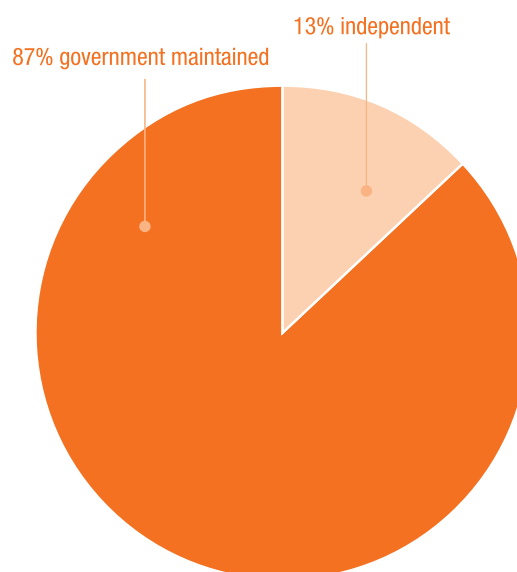


figure 3 funding status of surveyed establishments



It should be noted that although the sites surveyed do not represent a truly random stratified sample, the sample was not unrepresentative as a range of establishments across England, Wales and Scotland were surveyed. It is also important to

note that as the establishments selected themselves, their awareness of environmental issues was generally quite high and therefore their resource management may well have been better than average.

table 1 summary of the main characteristics of participating establishments

	schools	FHEIs
establishments covered	nursery, infant, junior, combined junior/infant, first, middle and secondary	FE colleges (incl. sixth form colleges), FHE colleges and universities
number of sites	81 (51 primary, 23 secondary)	22 (9 FE and FHE colleges, 13 universities)
age of building range	1400 – 2002	unavailable
number of buildings	1 – 27	unavailable
floor area	174 – 240,000m ²	3563 – 763,937m ²
teaching staff	3 – 87	77 – 3250
non-teaching staff	1 – 91	37 – 4352
student/teacher ratio	5:1 – 32:1	unavailable
number of students	28 – 1700	600 – 42,000

2.1 data collection

The study period was between 1 September 2003 and 31 July 2004. During this period the following activities were carried out

- questionnaire development
- auditing
- final report writing

Data was collected under the headings: site characteristics, environmental management, purchasing, energy and water use, other physical resources in use and waste management. The majority of environmental performance data was

obtained locally, with some purchasing and energy and water data coming from national sources.

Confidence intervals and standard deviations are often cited in the results. The confidence intervals reflect a measure of how precise the statistical estimate is (a wide interval reflects low precision and large uncertainty, a narrow interval indicates vice versa). Standard deviation reflects the average deviation in the data points from the sample mean. A large standard deviation, for instance greater than 50% of the mean value indicates high variability among the sampled points; a low standard deviation such as 10% indicates low variability amongst the sampled points.

In some areas, such as purchasing, adequate accurate data was not available during the audits, this report therefore occasionally uses the findings of secondary sources, these are highlighted wherever they are used. In addition some of the data collected during the audits was not externally verified, this fact is highlighted wherever this data has been used.

2.2 auditing

Due to the wide diversity of establishments in the education sector, the audits were separated into three categories

- 1) on-site visits – whereby Waste Watch environmental consultants visited educational establishments in person to carry out an environmental audit (including gathering information on energy and water usage)
- 2) waste analysis assessments – whereby a detailed analysis was carried out of the different types of waste produced by schools, colleges and universities. (In schools, waste from classrooms, staffrooms and offices was sorted into categories and weighed and in FHEIs waste from catering facilities [focusing on kitchen waste], halls of residence, students' unions and two buildings used for teaching was similarly analysed). This used a technique called waste stream analysis. These assessments were conducted by Waste Watch's environmental consultants and environmental consultants at Save Waste and Prosper (SWAP)
- 3) self-assessments – whereby individual sites filled out and submitted their own self

completion questionnaire assessing resource management (including energy and water usage)

This allowed for a rich variety of data to be collated from the sector. The data obtained from each type of audit was analysed separately to maintain the accuracy of the study. Please note that while the waste analysis assessments at FHEIs did include residential areas, the on-site environmental audits did not cover these areas.

2.3 reporting

Following the on-site audits, each establishment received a summary report of our findings which highlighted key areas and made practical recommendations of what steps could be taken to improve resource efficiency and improve environmental communication and awareness across the establishment. The audits and reports tried to initiate, or build on, changes towards more sustainable practices across participating establishments. An example of an audit report for a school is shown in appendix 4. For confidentiality, the name of the participating school has been removed.

Establishments that completed a self-assessment questionnaire received a generic audit report depending on their category ie primary school, secondary school or FHEI, which also included practical recommendations based on the general findings of the questionnaires.

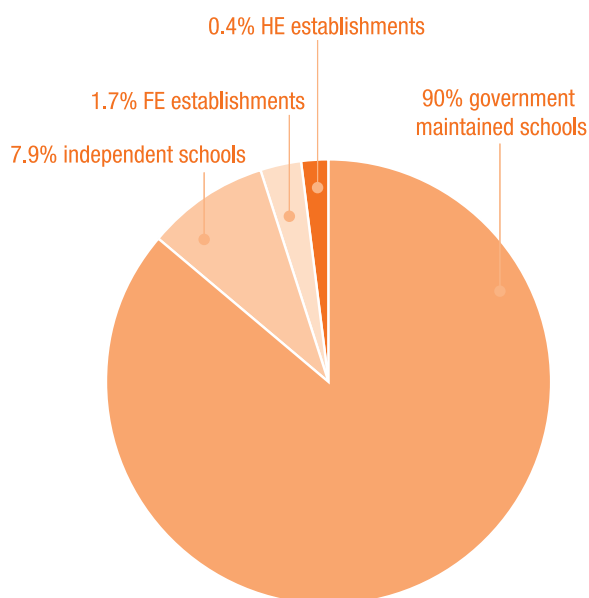


3 – overview of the UK education sector

There are nearly 30,000³ schools, colleges and universities in the UK and in 2001/2002 the sector employed nearly 1 million teachers and educated over 13 million students⁴.

The education sector in the UK can be divided up into two main areas: school education for pupils aged from 7-18, and FHE for students from 16 upwards including mature students. The proportion of the principle educational establishments in the UK is shown in figure 4.

figure 4 proportion of principal educational establishments in the UK education sector



3.1 school sector

The UK has nearly 28,000⁵ schools, including nursery, primary and secondary schools in both the independent and public sectors. As illustrated by figure 4, schools represent the largest aspect of the UK education sector.

The aim of school education in the UK is to educate people aged from 3-18 to National Vocational Qualification (NVQ) Level 3, GCSE or A-Level standard. In the UK every child has a right to a free place at school from the age of 3-18. Parents are legally responsible for ensuring that their children are educated and normally fulfil this by sending their child to school, although other means, such as education at home, are possible.

According to figures published by the principle education departments in the UK there were 557,900⁶ full-time equivalent teachers employed in government maintained (see appendix 3 for full definition), nursery, primary and secondary schools in the UK in 2001/2002. Teachers make up the majority of staff in schools, although a sizeable proportion of non-teaching staff (35% of all schools staff in England in 2003 and growing⁷) contribute to the make up of the largest sector in UK education. The number of classroom assistants, laboratory technicians, office staff, cleaners, cooks and bursars employed by schools in England has risen by 56% since 1998 to 225,000 in 2003.

Independent schools, ie not government owned (see appendix 3 for full definition), represent a smaller proportion of this sizeable sector, although there are still 2,400 independent schools in the UK, including approximately 790 secondary schools, educating 600,000 children⁸. The proportion of schools in the sector is represented in figure 5.

³ combined figures from Higher Education Statistics Authority (HESA) Student Record July 2002, DfES; National Assembly for Wales; Scottish Executive; Northern Ireland Department of Education

⁴ www.prospects.ac.uk

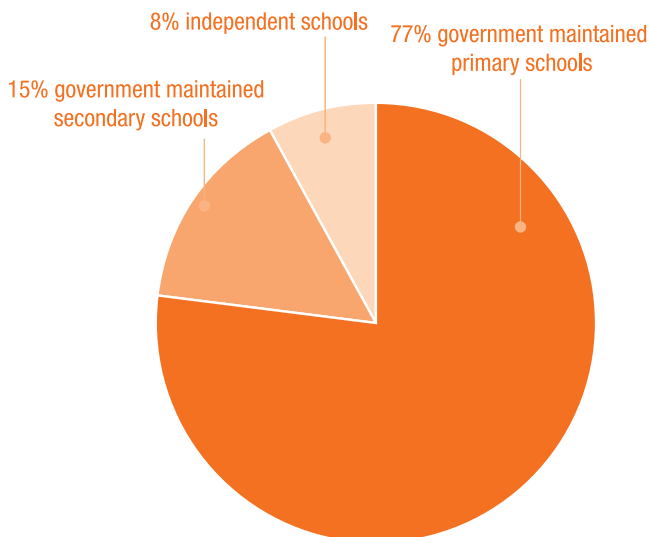
⁵ combined figures from DfES, National Assembly for Wales, Scottish Executive and Northern Ireland Department of Education

⁶ combined figures from DfES, National Assembly for Wales, Scottish Executive and Northern Ireland Department of Education

⁷ Statistics of education: Schools in England, DfES 2003 edn

⁸ www.prospects.ac.uk

figure 5 proportion of schools in the UK education sector

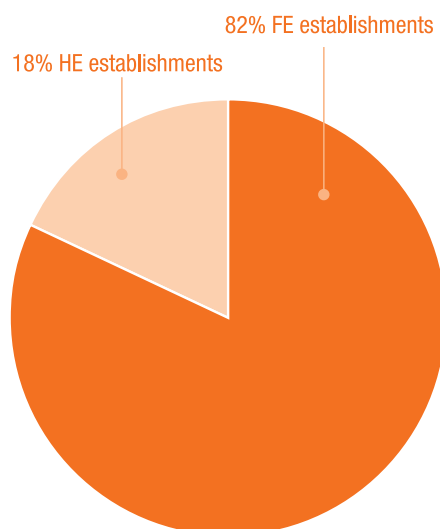


3.2 FHE sector

FE and HE establishments are often grouped together as these two aspects of the sector are similar in terms of size and scope (see sections 3.2.1 and 3.2.2 for definitions of each). As figure 6 shows, there are many more institutions of FE than HE.

In 2003 85% of 16-year olds went into further education or training⁹ and 43% of people leaving school went in to higher education¹⁰ in the UK. The FHE sector provides learning opportunities to be applied in either vocational or academic contexts.

figure 6 proportion of FE and HE establishments in the UK education sector



3.2.1 further education (FE)

FE establishments represent the largest aspect of the FHE sector in the UK; there are more than 500 FE colleges in the UK, which educate over 4 million¹¹ people and employ over 250,000 staff¹². The sector provides education and training outside of the schools sector after the school-leaving age of 16. FE institutions comprise sixth-form colleges and FE colleges. Adult and community education

⁹ www.guardian.co.uk

¹⁰ www.telegraph.co.uk

¹¹ www.prospects.co.uk

¹² *Skills Foresight for FE (Phase 1 Report)*, www.fento.org

can also be included under the FE umbrella. Many FE students are aged 16-19 but a great many are over this age. Courses include full and part-time, as well as short courses, evening classes, distance learning and work-based learning. They range from introductory courses in subjects from basic literacy and numeracy, to first aid and car maintenance, through to GCSE, A-level and beyond.

There are many different types of colleges, some having thousands of students, some only a few hundred

- general FE colleges: offer a wide range of courses
- colleges of technology: provide mainly technological courses
- sixth-form colleges: provide mainly full-time courses for 16-19 year olds
- tertiary colleges: provide academic and vocational courses mainly for 16-19 year olds but also for older students
- community colleges: may be general or tertiary colleges
- agricultural colleges: traditionally offer farming and horticultural courses but now also offer a wider range of subjects
- specialist colleges: offer courses in particular fields, such as art and design
- combined FE and HE colleges: offer courses at higher education level as well as FE

3.2.2 higher education (HE)

Despite being smaller than the FE sector, with over 2 million¹³ students in full and part-time higher education, 345,000¹⁴ employees and an annual income in excess of £14bn¹⁵, HE institutions represent a substantial aspect of the UK education sector.

¹³ HESA Student Record July 2002

¹⁴ Universities UK (summer 2003)

¹⁵ HESA Resources Volume 2001/02

¹⁶ Universities UK (summer 2003)

¹⁷ Universities UK (summer 2003)

¹⁸ www.scop.ac.uk

The HE sector provides education and training that takes place at universities, colleges and institutes of higher education. HE courses which are studied at these establishments are generally above the standard of GCSE, A-levels or NVQ Level 3. They include undergraduate degree courses, postgraduate courses and Higher National Diplomas (HND).

The sector is predominantly made up of two types of establishment – universities and HE colleges. The scale and functions of each of these types of establishment are explained in more detail below.

universities

According to figures released by Universities UK in 2003, there are 116 universities in the UK counting separately the colleges of Wales and London¹⁶ (when Wales and London are counted as single institutions the total is 90).

In the UK, all universities are governed by act of parliament and enjoy academic freedom. They appoint their own staff, decide which students to admit, provide their own courses and award their own degrees. Since 1992, when polytechnics were given their own degree-awarding powers and allowed to call themselves universities, the number of universities has increased considerably.

HE colleges

HE colleges represent the other main aspect of the UK HE sector. Currently, there are 55 HE colleges in the UK¹⁷ which currently educate about 9% of all HE students¹⁸ nationally.

HE colleges are publicly designated HE institutions which share many features of universities. They range in size from large, multi-faculty institutions with more students than many universities, to small or specialist institutions notably in the areas of art

and design, music and the performing arts, agriculture and teacher education. Colleges of higher education also provide education in many vocational areas, including business studies,

nursing and the professions allied to medicine. About one third of HE colleges consists of religious institutions¹⁹.



¹⁹ www.scop.ac.uk

4 – study results

This section shows the findings from all three types of audits that were undertaken as part of this project. The establishments chosen are representative of the range and location of various types of education providers in the UK.

The 96 establishments audited in total have been divided into two main categories

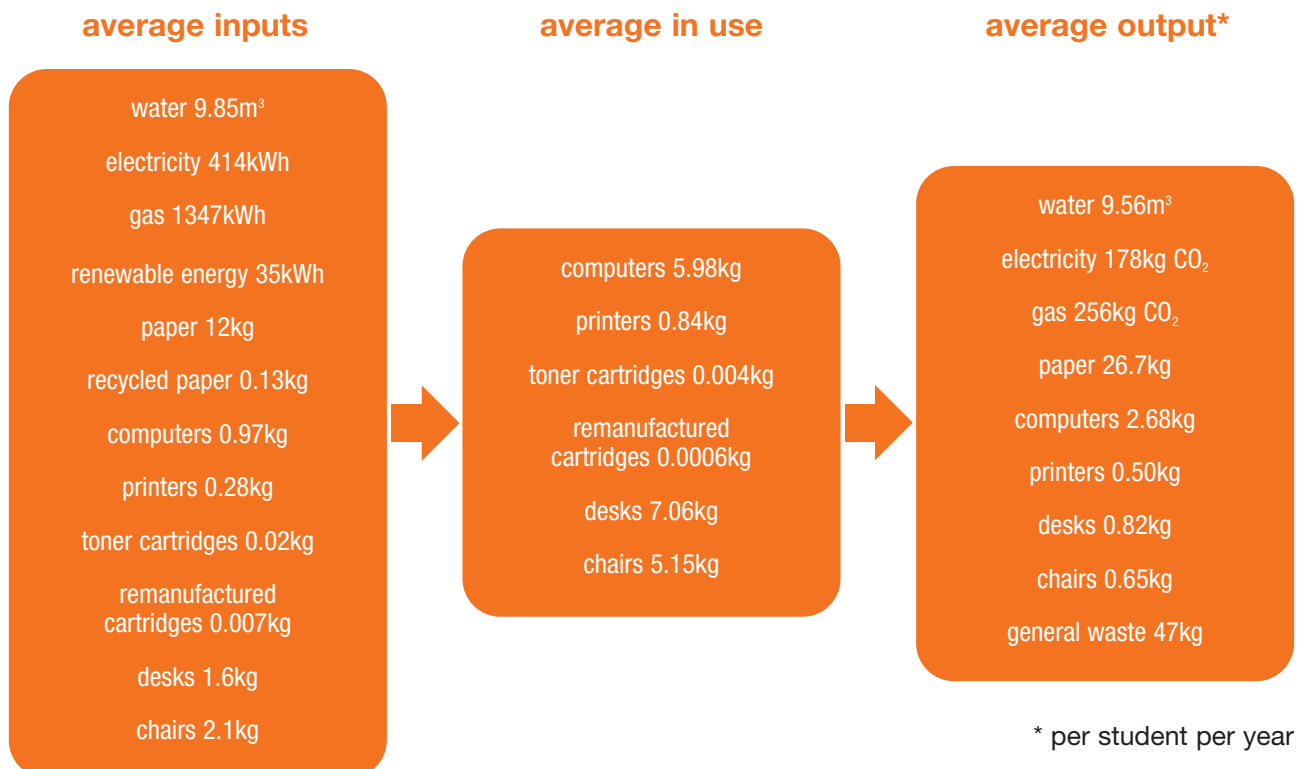
- **schools** – including government maintained and independent nursery, primary and secondary schools (see glossary for definitions)
- **FHEIs** – including government funded general FE colleges, agricultural colleges and universities

The findings are detailed under the headings environmental management (including environmental initiatives and awareness and barriers to improved environmental performance), purchasing and resource use (including catering

and cleaning), utility use (including energy and water), and waste. Due to their differences, the school and FHE sectors are discussed separately, although comparisons are made between them. As already noted, it was only for FHEIs that waste audits covered residential areas such as halls of residence. The on-site environmental audits in schools did not cover residential areas.

The results of the audits are reflective of the situation at the particular point in time when the visits were undertaken. They may be used as reference points and for guidance. However, it is likely that the situation will change due to economic, environmental, social and legislative drivers, which are discussed in more detail in section 7. The overall average resource flows per student are summarised in figure 7. The breakdown of average resource flows per student per sector (ie primary, secondary and FHEI) outlined in appendix 1.

figure 7 average annual resource use per student in the education sector, based on audit results (not externally verified)



4.1 environmental management

Table 2 summarises the responses to questions within the audits relating to environmental policy and management, according to the school and FHE sectors. As shown, the results within each sector are varied and sometimes conflicting.

A large proportion of establishments within both

sectors have a member of staff responsible for the environment or environmental performance and monitor some form of environmental impacts, such as energy use. However, fewer establishments within either sector train their staff in environmental issues and fewer still set targets to improve their environmental performance.

table 2 summaries of responses to questions asked during audits relating to environmental policy and management within the school and FHE sectors

	% of positive responses	
	schools	FHEIs
Does your organisation have an environmental policy?	0	46
Does your organisation set targets to improve its environmental performance?	37	38
Does your organisation have any environmental transport initiatives in place?	78	62
Does anyone from your establishment monitor environmental impacts?	84	92
Do you have a member of staff for the environment/environmental education?	62	86*
Do members of staff receive environmental training?	24	46

* includes dedicated environmental coordinators

4.2 environmental initiatives and awareness

The following section relates to environmental initiatives in place and general levels of awareness at the participating establishments. In total 61% of the establishments that took part in the study were involved in formal national or local environmental initiatives of some kind (see section 7 for an explanation of these initiatives).

4.2.1 environmental initiatives and awareness in schools

Tables 3 and 4 show participation in environmental initiatives in surveyed schools. Nearly half the schools took part in a formal environmental initiative (table 2). In addition, over a third of schools carried out informal initiatives such as recycling and taking steps to reduce energy and water use (table 3).

The majority of participating schools (87%) carried out awareness work with their pupils, such as environmentally themed assemblies and

environmental noticeboards and 45% had an environmental club or society which helped raise awareness of environmental issues across the school. Table 3 shows that 67% of participating schools that provided information on membership

to environmental initiatives belonged to a national scheme (51 schools provided information on this area). Table 4 shows that 56% of the 51 schools that provided information set targets to improve their environmental performance.

table 3 proportion of surveyed schools participating in a formal environmental initiative (not externally verified)

environmental initiatives	positive responses	
	number	percentage
Eco Schools	17	33
Greening Britain's Schools	1	2
Safer Routes to School	10	20
Green Flag Awards	1	2
SWAC	2	4
Waste Watch's Cyclor Robot	3	6
total	34	67



table 4 proportion of surveyed schools that set targets for environmental improvement

environmental targets	positive responses	
	number	percentage
increasing recycling rates	10	20
reducing energy use	5	10
reducing water use	3	6
establishing an environmental committee	1	2
reducing car use	2	4
improving school grounds	2	4
reducing litter	1	2
reducing waste	1	2
reducing overall environmental impact	3	6
total	29	56

4.2.2 environmental initiatives and awareness in FHEIs

As with schools, participation in environmental initiatives was found to be high and the 11 FHEIs that provided information on this area all belonged to a national environmental initiative (see table 5). In addition, the majority of participating establishments also undertook one or more of the internal environmental initiatives and had targets to

improve their environmental performance as shown in table 6. It should be noted that some establishments had several targets which is why the total number of positive responses is larger than the number of respondents in this area.

In the FHEIs surveyed, 69% had an environmental club or society that was responsible for raising awareness of environmental issues amongst students.

table 5 proportion of surveyed FHEIs participating in various formal environmental initiatives (not externally verified)

environmental initiatives	positive responses	
	number	percentage
EAUC	5	45
Higher Education Partnership for Sustainability	1	9
Higher Education Environmental Performance Improvement (HEEPI)	1	9
Copernicus	1	9
Eco Campus	1	9
The Carbon Trust	1	9
Scottish Universities Network for Sustainability	1	9
total	11	99

table 6 proportion of surveyed FHEIs that set targets for environmental improvement (not externally verified)

environmental targets	positive responses	
	number	percentage
increasing recycling rate	4	36
reducing energy use	3	27
reducing water use	1	9
reducing car use	2	18
planning to introduce environmental management system	1	9
increasing biodiversity	1	9
total	12	n/a

4.3 barriers to improved environmental performance

Figure 8 shows the most commonly cited barriers to improved environmental performance at the participating schools. As shown, staff time and funding issues are the most common barriers amongst schools. The most commonly cited barrier amongst FHEIs was funding (29%) with awareness being the second most prevalent (figure 9). Note that each participating establishment could cite more than one barrier if experienced.

figure 8 most commonly cited barriers for participating schools to improved environmental performance (not externally verified)

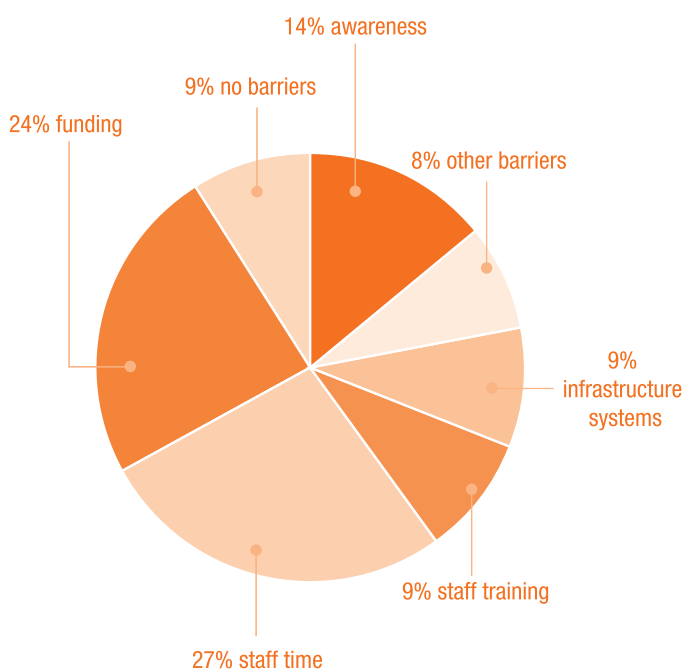
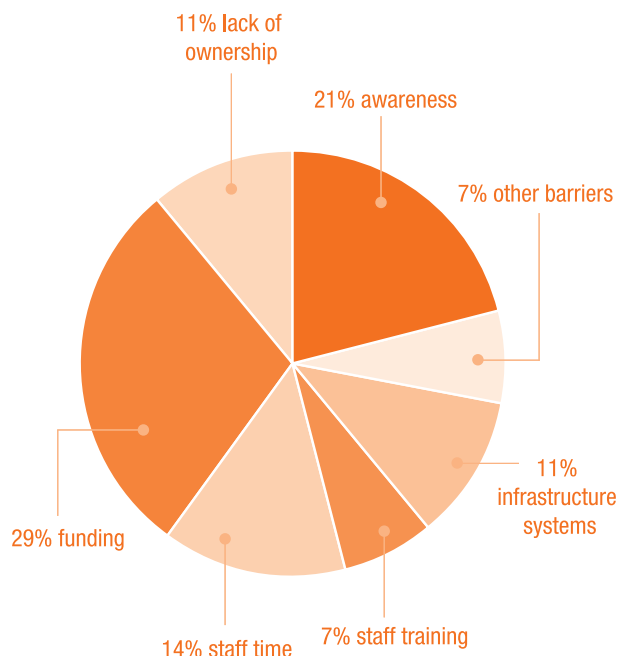


figure 9 most commonly cited barriers for participating FHEIs to improved environmental performance (not externally verified)



4.4 purchasing and resource use

Purchasing potentially represents an area where there is a significant impact on the environment through the types and amounts of resources purchased and the subsequent waste produced.

The following section gives details of the purchasing and resource use habits of schools and FHEIs. It draws on data collected from participating establishments in this study and also from secondary data sources. Please note that this survey did not collect purchasing data in terms of spend, only quantities. Secondary sources of data have been used when considering spending.

4.4.1 purchasing and resource use in schools

Schools spend a significant proportion of their budgets on physical resources. According to a survey conducted by the British Educational

Suppliers Association (BESA), English government maintained schools alone spent nearly £1.2 billion on furniture, teaching equipment, stationery and ICT in 2003/4²⁰ (table 7).

table 7 results of a survey conducted by BESA in English government maintained primary and secondary schools, highlighting the spend on principle physical resources

	English primary schools 2003/04	English secondary schools 2003/04
furniture average per school all schools per pupil (sample)	£2,170 £42m £9.87	£12,330 £46m £13.85
materials + equipment average per school all schools per pupil (sample)	£14,620 £282m £66.45	£57,005 £213m £64.05
stationery items average per school all schools per pupil (sample)	£4,985 £96m £22.65	£17,410 £65m £19.56
ICT average per school all schools per pupil (sample)	£11,100 £214m £50.45	£44,445 £166m £49.95

source BESA²¹

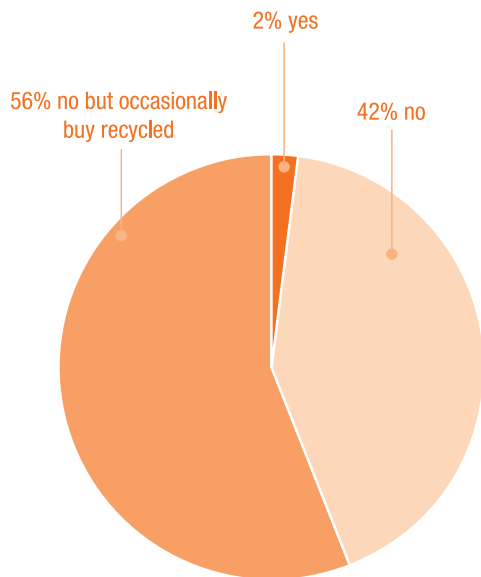
A section of the audit focused on the purchasing of recycled products. Schools were asked whether or not they had a policy to buy recycled products. Figure 9 shows that whilst only 2% of the

participating schools actually had a formal policy to buy recycled, 56% of schools do sometimes buy recycled, although there is no formal policy in place.

²⁰ BESA (2004) *Resources in English Schools 2004 Summary Edition*, BESA, www.besonet.org.uk

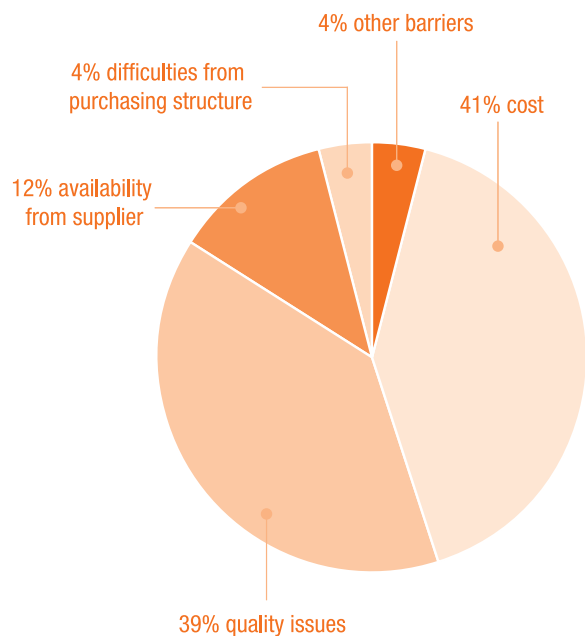
²¹ www.besonet.org.uk

figure 10 percentage of participating schools with policies to buy recycled products (not externally verified)



When participating schools were asked if they had experienced any barriers to buying recycled products 23% responded 'no' whilst the remaining 77% said that they had experienced some barriers. Figure 11 shows the most commonly cited barriers. Note that schools were able to cite more than one barrier if experienced, rather than citing the largest barrier to buying recycled. Cost was the most commonly experienced barrier to buying recycled products, with nearly half of schools asked citing it.

figure 11 most commonly cited barriers to buying recycled products in participating schools (not externally verified)



With regard to specific purchases, participating primary schools purchased fewer PCs, printers and chairs on average per year than secondary schools but purchased greater numbers of desks (figure 12). This could have been due to the fact that there was limited data available in this area at the establishments surveyed. However, when taking student numbers into consideration (figure 13) primary schools purchase greater quantities of printers, desks and chairs per pupil per year than secondary schools.

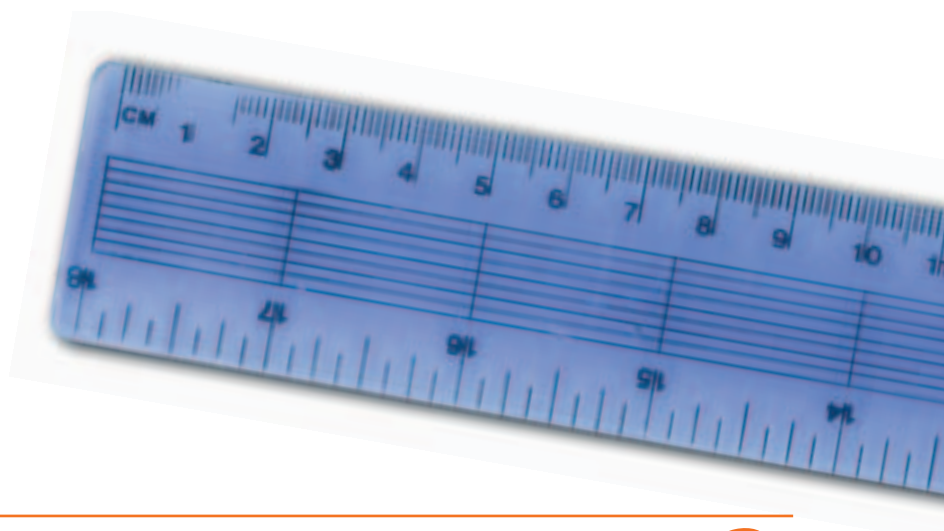


figure 12 average annual purchases in participating establishments (not externally verified)

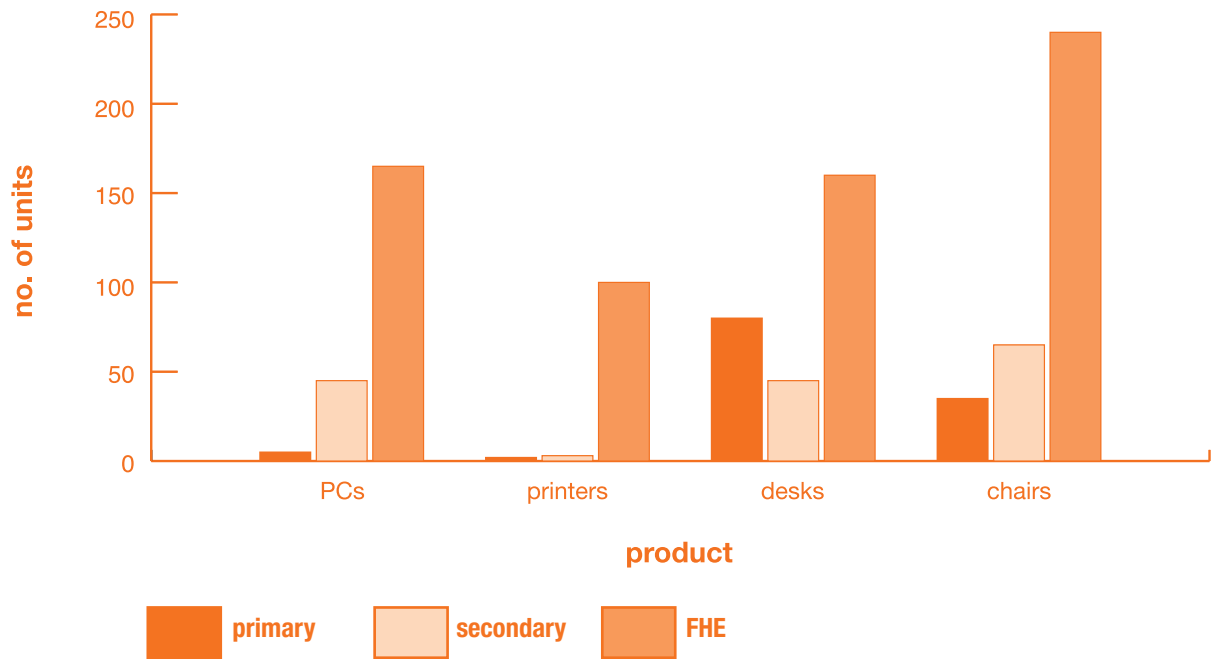


figure 13 average number of purchases per student per year in participating establishments (not externally verified)

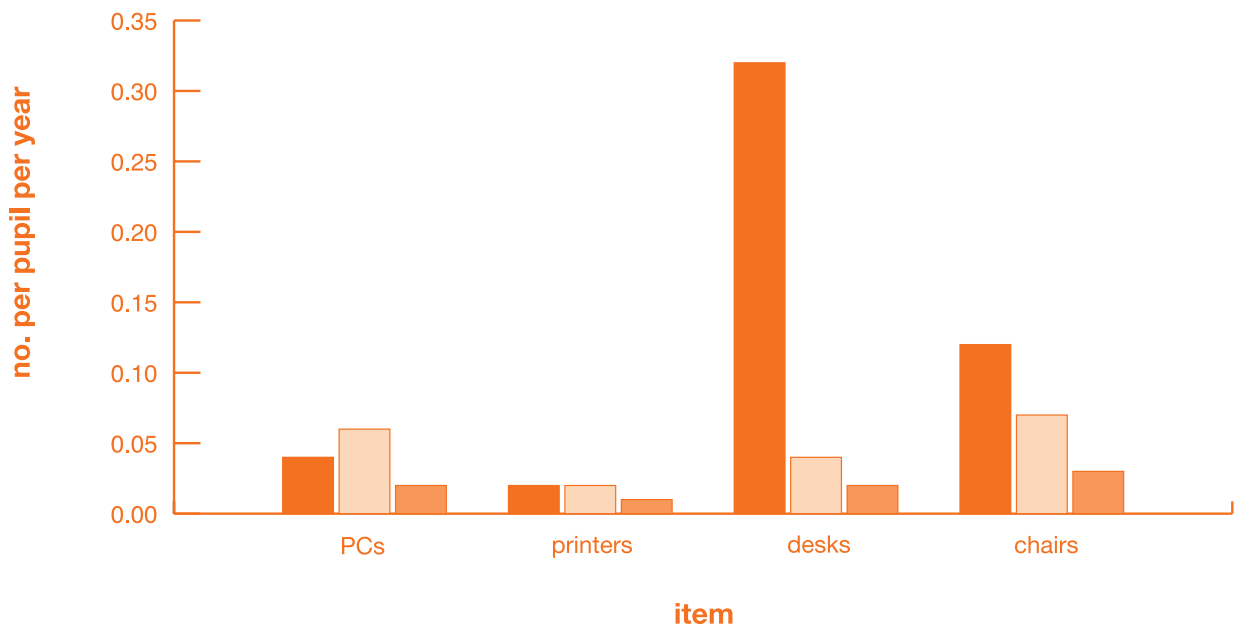


Table 8 outlines the amount of white A4 paper purchased per year by the schools surveyed in tonnes and reams, as well as the amount that the surveyed schools purchased per pupil each year

(95% confidence intervals are shown in parentheses). As shown primary and secondary schools purchase a similar amount of A4 paper – 5.5 reams – per pupil.

table 8 paper purchasing in participating schools (confidence values are shown in parentheses at 95%)

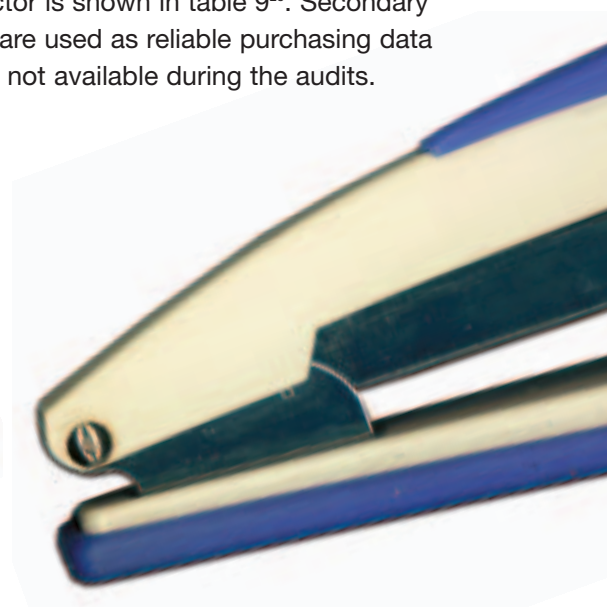
	primary schools surveyed	secondary schools surveyed
virgin paper purchased per surveyed school per year	3.2 tonnes (1.1 – 5.3 tonnes) 3.2 tonnes = 1280 reams	12.5 tonnes (4.8 – 20.1 tonnes) 12.5 tonnes = 5000 reams
per pupil per surveyed school each year	13.7kg (4.7 – 22.7kg) 13.7kg = 5.5 reams	13.8kg (5.3 – 22.2kg) 13.8kg = 5.5 reams

4.4.2 purchasing and resource use in FHEIs

A number of different surveys have shown that the FHE sector spends a huge amount of money every year on goods and services. The National Audit Office has calculated that UK HE bodies (ie excluding FE) alone spend over £3 billion²² a year and the total for all FHE bodies in the UK is much higher²³. According to the Higher Education Pay and Prices Index (HEPPI), expenditure on items such as consumables and equipment

represent the highest level of spending on resources other than staff. A similar story is apparent in the FE sector where non-pay spend represents 25% of all expenditure in an average general FE college in the UK²⁴.

A breakdown of key non-pay resources purchased annually by approximately one quarter of the higher education sector is shown in table 9²⁵. Secondary data sources are used as reliable purchasing data was generally not available during the audits.



²² National Audit Office (NAO) (1999) Procurement in the English Higher Education Sector, NAO

²³ www.heepi.org.uk

²⁴ www.lsc.gov.uk

²⁵ this information has been kindly supplied by the Southern Universities Purchasing Consortium (SUPC), a key member of seven regional consortia responsible for the strategy and administration of national and regional contracts with suppliers to the UK HE sector

table 9 total annual non-pay expenditure in approximately 25% of the UK HE sector (based on figures provided by Southern Universities Purchasing Consortium [SUPC])

purchase	£
furniture	£4,672,438
books	£7,770,464
stationery	£12,928,071
IT	£35,056,943
catering	£13,783,920
cleaning	£2,019,00

Although these figures are substantial, they do not portray the true extent of expenditure on consumables and equipment in the sector due to the considerable number of devolved purchasing contracts in existence. Nevertheless it is evident from these findings alone that the sector purchases a considerable amount of consumable goods and services which has the potential to have a large environmental footprint.

Figure 14 shows to what extent the surveyed FHEIs purchase recycled products. As shown, half do not have a policy to buy recycled or actually buy recycled products and only 8% have a policy in place. However, 42% said that whilst they do not have a formal policy they do sometimes buy recycled products. When looking at the barriers to purchasing recycled products, all the surveyed FHEIs said that they had experienced at least one barrier. Figure 15 shows that the most commonly cited barrier was cost, followed by concerns about the quality of recycled products, therefore mirroring the results from schools. Note that FHEIs were able to cite more than one barrier if experienced.

figure 14 participating FHEIs with policies to buy recycled products (not externally verified)

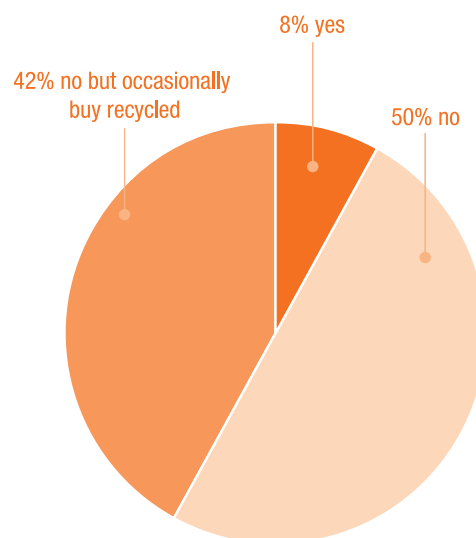


figure 15 most commonly cited barriers to buying recycled products in participating FHEIs (not externally verified)

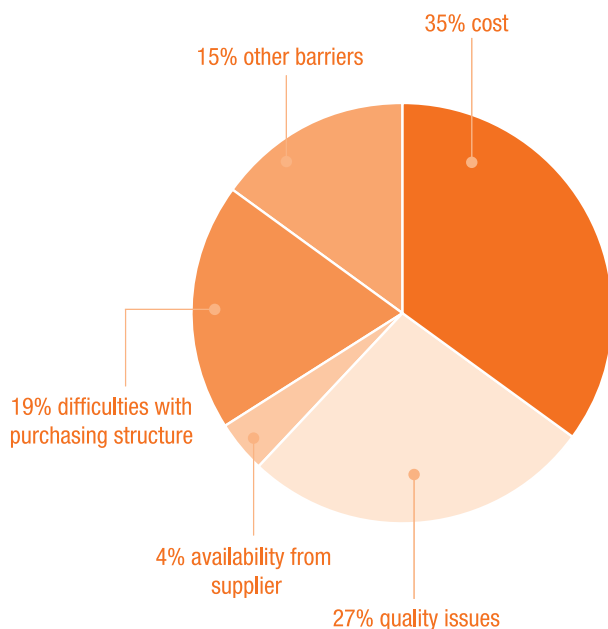
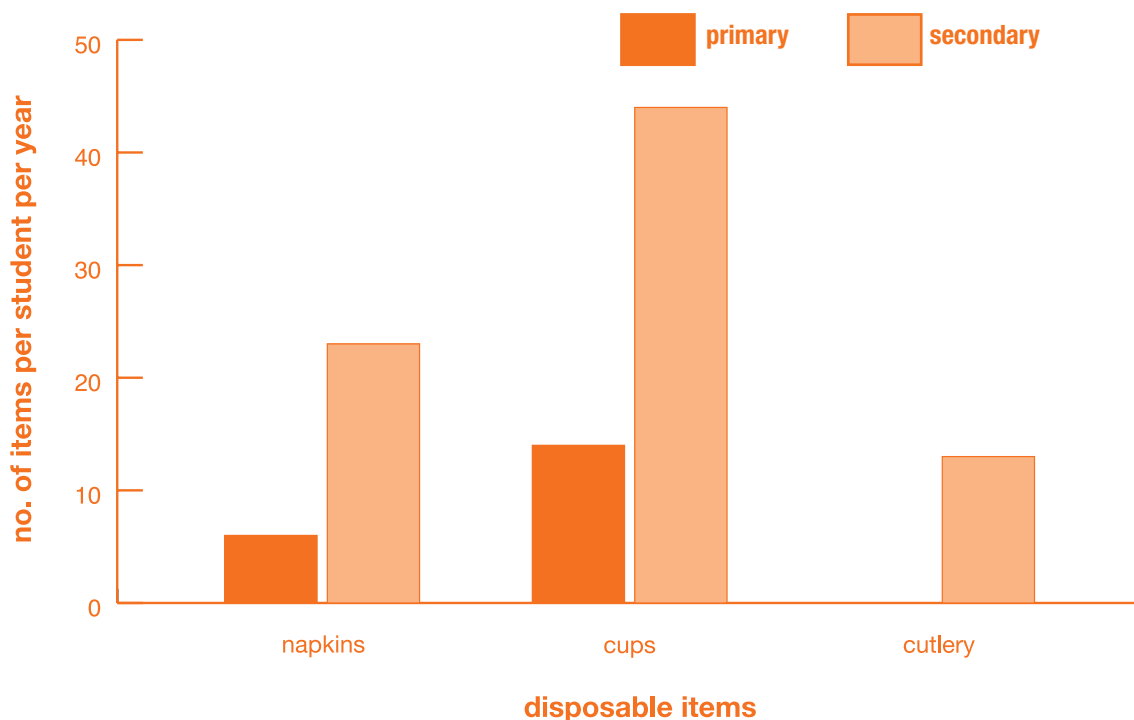


figure 16 the number of disposable items purchased per pupil per year by participating primary and secondary schools (not externally verified)



When considering specific purchases, figure 12 shows that FHEIs purchase much greater quantities than schools, although they purchase fewer items per student than primary and secondary schools (figure 13).

4.4.3 purchasing and resource use – catering

Catering is often a large part of an establishment’s activities which involves the purchasing and use of significant quantities of food and catering related consumables.

The types of foods purchased are significant. The audits showed that primary schools tend to purchase more fresh foods such as fruit and vegetables and dried and canned goods whilst secondary schools rely heavily on frozen, pre-made goods such as burgers and pizzas, which are seen as more convenient foods and tend to be associated with a greater production of waste. Similarly there were differences in the quantities of disposable catering items purchased and used. Figure 16 shows that the participating secondary schools used significantly more disposable items in a year than the primary schools.

Unfortunately, due to the much greater size of FHEIs, the audits were unable to collect reliable data relating to catering purchases. It was however noted that FHEIs have a high propensity to use disposable catering items in most of their catering outlets and rely heavily on packaged, convenience foods. A large amount of waste at FHEIs is therefore associated with catering.

4.4.4 purchasing and resource use – cleaning

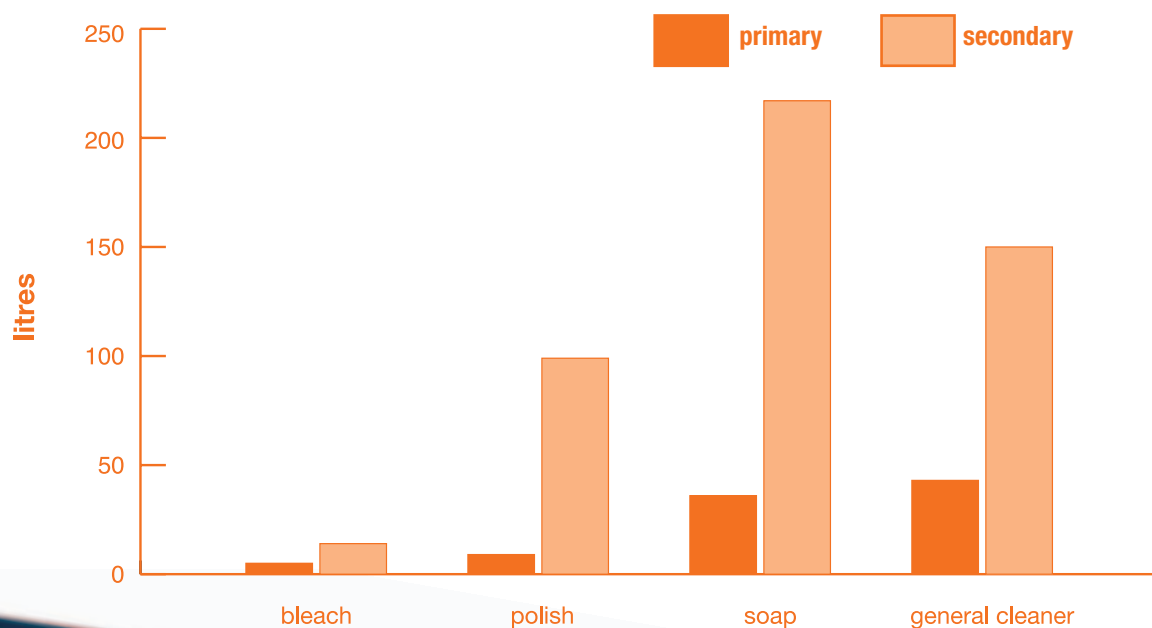
Cleaning products were considered in the audits as they can have an environmental impact through the large scale use of chemical cleaning products.

Figure 17 shows the annual average quantities of

cleaning products purchased by participating primary and secondary schools. Very little bleach was purchased or used by the schools but very few schools actively sought environmentally friendly cleaning products. As expected, due to the differences in size, the annual average usage for all cleaning products was higher for secondary than for primary schools.

The majority of the schools surveyed implemented efficient cleaning practices such as measuring out chemicals to correct levels and diluting cleaning products before use. Many reduced waste by reusing cleaning bottles and buying in bulk.

figure 17 average annual quantities of cleaning products purchased by participating primary and secondary schools (not externally verified)



4.5 utility use

Table 10 shows the gas, electricity and water consumption across the primary school, secondary

table 10 average annual energy and water use by participating establishments in the primary, secondary and FHE sectors (not externally verified)

sector	gas (kWh)		electricity (kWh)		water (m ³)	
	number of contributors	average per student	number of contributors	average per student	number of contributors	average per student
primary	23	633	22	330	30	7
secondary	7	1593	10	488	8	11
FHE	6	1817	6	424	9	11

school and FHE sectors. Figures are per year, based on the data collected from participating establishments. As shown, not all participating establishments were able to provide information relating to their energy and water consumption therefore the sample size for this data set is less than for other areas.

table 11 total annual utility use by the education sector based on figures extrapolated from this study's findings

gas	electricity	water
17 billion kWh	5 billion kWh	66 million m ³
3.3 million tonnes CO ₂	2.15 million tonnes CO ₂	

Table 11 shows estimated utility use and resultant CO₂ emissions for the education sector as a whole. From this information it appears that the sector as a whole produces 5.45 million tonnes of CO₂, the potential for reducing the sector's impact on the environment is therefore very significant.

4.5.1 energy

When taken as a whole, the education sector consumes a vast amount of energy for its heating and electricity requirements and much of the environmental impact of educational establishments is related to this consumption. In addition, although this study did not examine transport use, the energy used to transport students and staff to and from the establishment also has a significant environmental impact. For example, Walk to School estimates that 'cars ferrying 11-15 year olds to school in the UK emit

187,422 tonnes of carbon dioxide each year. If just one in 20 of those children were to walk or cycle instead, this would reduce the level by nearly 10,000 tonnes a year.²⁷

Many of the establishments that participated in the project identified energy use as having the largest environmental impact as a result of their establishment's activities. As table 12 shows, the majority of both schools and FHEIs surveyed monitored some form of environmental impact, which in most of the cases included energy

²⁷ www.walktoschool.org.uk/info/facts.htm

monitoring. However, tables 4 and 6 show that only 9.5% of participating schools and 13% of FHEIs

had targets or active initiatives in place to reduce their energy use.

table 12 median energy and water benchmarks for government maintained schools in England: 2002-2003²⁷

	nursery schools	all primary schools	primary schools with pools	primary schools without pools	all secondary schools	secondary schools with pools	secondary schools without pools
energy use per m² floor area							
kWh	28	199			194		
kg of CEUs	17.91	13.35	n/a	n/a	13.19	n/a	n/a
costs	£5.80	£4.11			£3.83		
energy use per pupil							
kWh	1299	1150			1632		
kg of CEUs	79.33	77.63	n/a	n/a	110.93	n/a	n/a
costs	£25.76	£24.23			£32.40		

source DfES report on energy and water used in government maintained schools, 2004

It is important to note that while a few of the participating establishments used alternative sources of energy for heating, such as fuel oil, gas is only considered here as it was used by the majority.

4.5.1.1 energy in schools

According to data from Head Teachers for Industry (HTI)'s environmental initiative Think Leadership²⁸, UK schools account for 25% of public sector energy costs and they spend nearly £400 million per year on energy. The 25% most inefficient schools use more than three times as much energy per pupil than the most efficient 25% and the average school could save up to £17.85 per pupil per year by implementing energy efficiency measures. This would result in a 23% reduction in carbon dioxide emissions in the school sector. Furthermore the government report which outlined

notes for table

all figures relate to annual cost and consumption this data is relevant to the 2002-2003 financial year and was collected from over 22,000 government maintained schools across England.

*CEUs = carbon equivalent units. Energy consumption was converted into CEUs using conversion factors published in Building Regulations 2000, part L2

the UK's climate change programme suggested a reduction of carbon emissions in schools of 10% of 2000 levels by 2010 was achievable²⁹. At present, however, schools do not have a statutory requirement to report on the energy and water they use and the subsequent carbon dioxide they produce.

According to the data collected during this project (figures 18 & 19), primary schools use less than half the amount of gas per pupil than secondary schools (633 compared to 1593 kWh/pupil) and

²⁷ DfES (2003) Energy and water benchmarks for maintained schools in England, 2002-2003, DfES, www.dfes.gov.uk/rsgateway/DB/SBU/b000477/index.shtml

²⁸ www.thinkleadership.org.uk

²⁹ Department of Environment, Transport and the Regions (DETR) (2000) Climate Change – The UK Programme, DETR

almost a third less electricity per pupil (330 against 488 kWh/pupil).

Although the school sector is not required to report on its energy use, the DfES produces regular reports on energy consumption in English government maintained schools. The data enables

benchmarking of utility consumption in schools and allows for a more accurate assessment of greenhouse gas emissions from the schools sector in England. The most recent results were published in early 2004 and the key findings from the report are shown in table 11.

There are some similarities between this and the data collected during this project. Both sets show a similar total energy use (gas and electricity) per pupil in primary schools. However, this project's results show that secondary schools use double

figure 18 average annual gas consumption per student based on participating establishments (not externally verified)

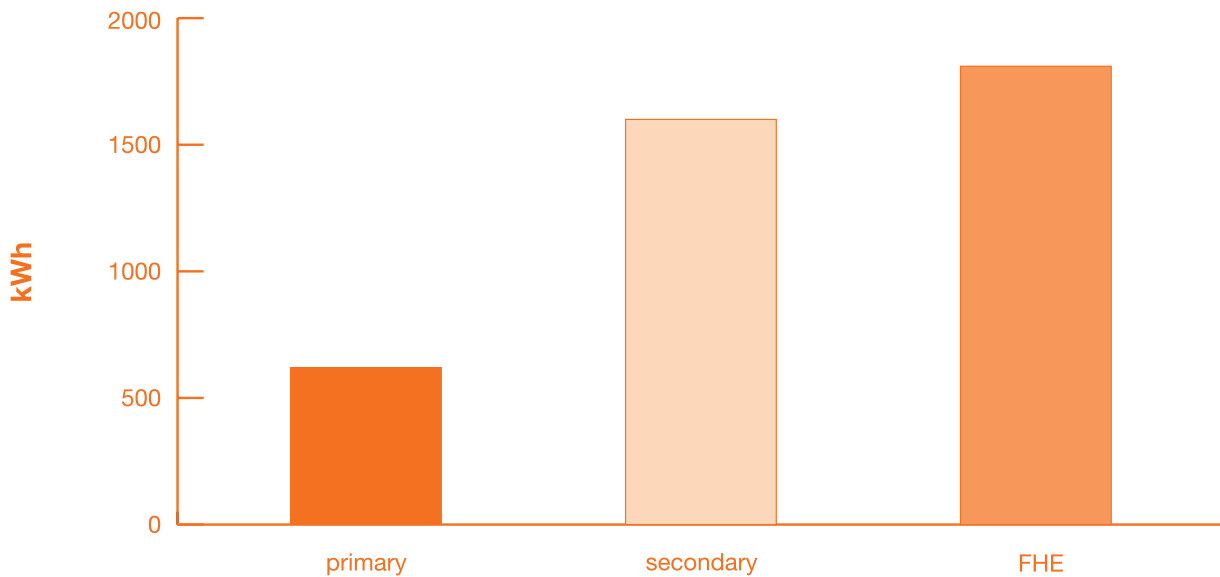
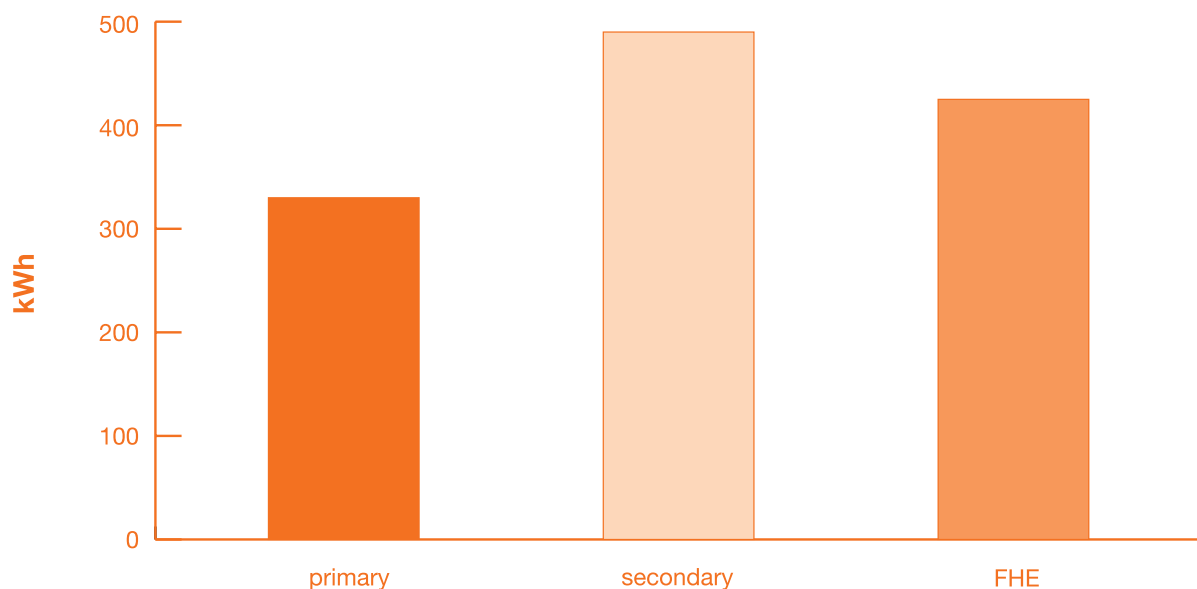


figure 19 average annual electricity consumption per student based on participating establishments (not externally verified)



the energy per pupil of primary schools whereas the DfES results show this figure as only 30% higher. This disparity may be due to the fact that the sample sizes for this project were much smaller than for the DfES data and this should be taken into account when considering the data. Additionally, the DfES data shows that although energy use per pupil is 30% higher for secondary schools, primary and secondary schools use the same amount of energy per m³.

4.5.1.2 energy use in FHEIs

Energy consumption in the FHE sector in the UK is vast. In England alone, annual energy costs for the sector total more than £200 million and at least 3 million tonnes of CO₂ is released into the atmosphere as a result³⁰. This is translated into annual energy costs per institution which range from under £200,000 to over £3 million and this generally accounts for over 25% of building-related revenue spend.

As already discussed, many of the participating FHEIs monitored energy consumption, although only 13% set targets for reduction. However, most of the establishments recognised that energy consumption needs to be tackled and there were some measures in place to address this. For example, energy efficient lighting and double glazing were relatively common. More advanced measures included energy policies, upgraded heating and the use of renewable-sourced electricity but our survey showed that these types of measures were more infrequently implemented.

Graphs 17 and 18 and table 10 show according to this study that FHEIs use an average of 1817kWh of gas and 424kWh of electricity per student. From these results FHEIs on average use less electricity per student than secondary schools. This is not the case for gas however.

4.5.2 water

Water consumption is not always considered an important environmental impact. However, it can represent a considerable cost to an organisation, there is energy associated with its transport and treatment and as it is a resource that is not in limitless supply it is therefore important to conserve water.

4.5.2.1 water use in schools

According to the DfES, schools spend a total of around £70 million a year on the provision of water and treatment of waste water; an average of over £2,500 per school. Few participating schools in this survey undertook water saving measures and fewer still identified water use as having a major environmental impact, which demonstrates the lack of awareness that people have around this issue.

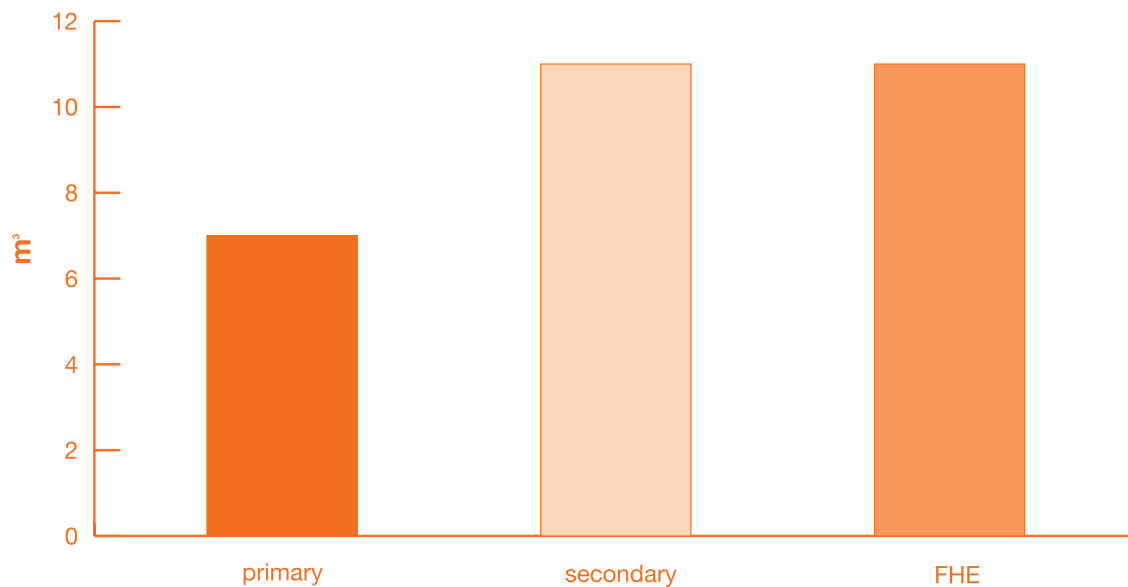
The results from this survey show that primary schools use an average of 7m³ of water per pupil per year with secondary schools using 11m³ per pupil per year (figure 20). The DfES estimates that, with careful water management in most schools, this figure could be reduced to just 4m³ per pupil per year which could save a school of 600 pupils around £5,000 every year³¹.

³⁰ Action Energy (2004) *Energy Efficiency in Further and Higher Education*, Action Energy

³¹ www.teachernet.gov.uk/wholeschool/sd/focuson/water/



figure 20 average annual water consumption per student based on participating establishments (not externally verified)



4.5.2.2 water use in FHEIs

Water use in colleges and universities is expensive both in terms of environmental and financial costs. UK universities and colleges spend over £50 million a year on water and sewerage³². This represents nearly half of the water consumption of the entire UK education sector, despite the small numbers of FHEIs across the UK compared to schools.

Currently the typical water consumption of a university or college in the UK stands at 0.62m³³³ per m² of floor area. A university or college which is performing particularly well in terms of water consumption will use 0.40m³³⁴ of water per m² of floor area.

The survey found that participating FHEIs had a higher level of awareness in terms of the importance of water conservation and consequently water saving measures were more common than in participating schools. These ranged from push taps and reduced cistern flows

to waterless urinals. According to the results, FHEIs consume approximately the same amount of water as secondary schools (11m³ per student per year). However, as with energy consumption, the small sample size should be taken into consideration.

4.6 waste

Due to the waste stream analysis that was conducted across many of the participating sites, the amount of data collected for waste was greater than for other areas, the following section on waste is therefore the most substantial results section in this study.

Based on the findings of this study, it is estimated that 691,091 tonnes of waste are produced each year by the education sector in the UK³⁵. A 95% confidence interval for this amount is quite wide, 169,857-1,212,325 tonnes, mainly because of the high variability between establishments and the low sample size for FHE sites.

³² www.heepi.org.uk

³³ www.watermark.gov.uk

³⁴ www.watermark.gov.uk

³⁵ in this study the education sector comprises primary and secondary schools plus FHEIs

As an overview of the sector, the study found that over 50% of the waste (by weight) from all sites was made up of recyclable paper and cardboard. The study found that 55% of the sites sampled recycled some of their waste. Recycling rates across all types of establishments surveyed which recycled waste ranged from 1–89% with their average recycling rate being 32%. Extrapolated from the survey findings, a breakdown of waste arisings and recycling rates for the education

sector in England, Wales and Scotland is shown in table 13.

As expected, student numbers was found to be the key factor in determining the amount of waste generated by the establishment regardless of their type, location or size. A greater number of students increases the amount of waste generated by the education sector. The study also found that the number of staff in an establishment also affects the amount of waste generated in schools (ie a greater number of staff will increase the amount of waste generated). Figure 21 shows how student numbers increased the amount of waste produced at the schools surveyed.

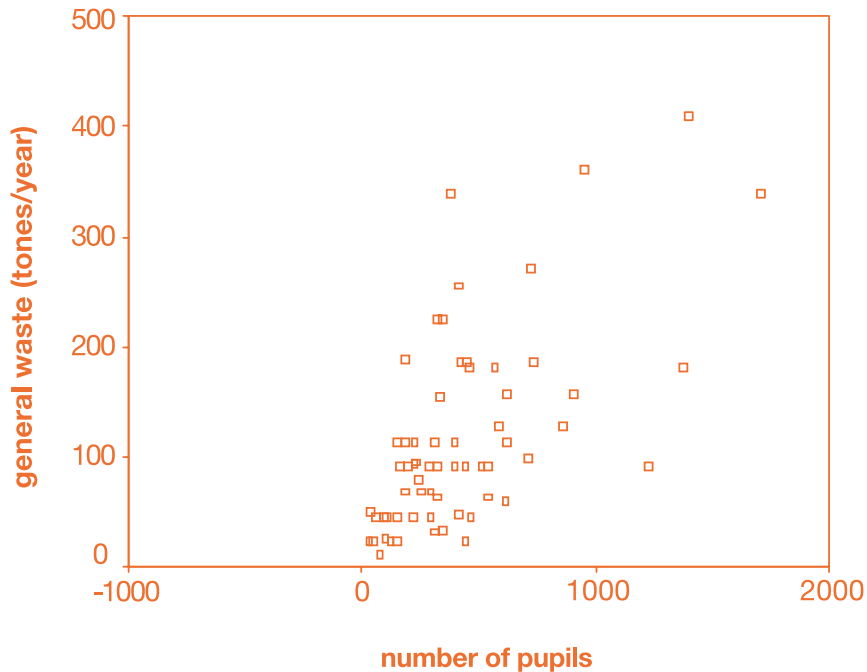
table 13 waste generated and recycling rate in the education sector in England, Scotland and Wales (confidence values are shown in parentheses at 95%)

category	amount of waste
total waste arisings for the education sector in England, Scotland and Wales (tonnes/year)	691,091 tonnes (169,857 – 1,212,325)
average waste produced per site per student/year in primary and secondary schools	22kg* (15 – 29kg)
average waste produced per site per student/year in further and higher education	96kg (36 – 261kg)
average recycling rate per site**	32%

* this is an average figure based on data from all sites, it should not be used as a benchmark figure

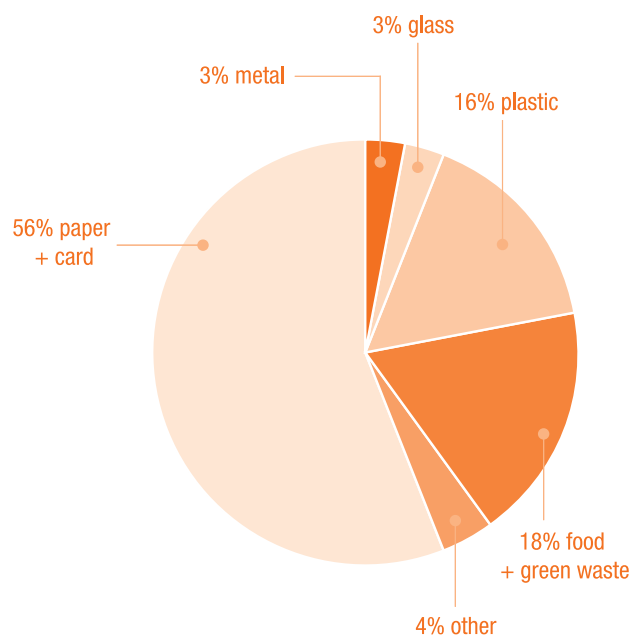
**data extrapolated from sites that recycled in the study

figure 21 the impact of student numbers on waste generated



When considering the types of waste produced by the sector, figure 22 shows that paper and card accounted for more than half of the waste analysed in detail. At 18% of the weight of waste, food and green waste makes up the second largest proportion of the waste stream. Plastic constitutes 16%, and metal/glass are 3% each.

figure 22 main types of waste generated (by weight) by the education sector in England, Scotland and Wales based on data from all sites surveyed



4.6.1 schools

Table 14 shows that while primary schools produce less than half the waste per site per year than secondary schools, the primary schools sector produces nearly double the amount of waste per year than the secondary school sector due to the

considerably larger numbers of establishments in the primary schools sector.

table 14 total waste arisings in the school sector along with the proportion of sampled schools that have implemented recycling schemes

	primary schools	secondary schools	all schools
total waste arisings for schools sector based on audit findings (tonnes/year)	139,939 (106,083 – 173,795)	62,521 (52,711 – 72,332)	202,460 (167,211 – 237,709)
average amount of waste produced per site* (tonnes/year)	6.1 (4.6 – 7.6)	14.3 (12.0 – 16.5)	n/a
proportion of schools sampled with recycling schemes	51%	42%	48%

* this is an average figure based on data from all sites, it should not be used as a benchmark figure

The findings from this study were extrapolated to represent the whole school sector. Table 15 gives a breakdown of waste produced by the school sector in England, Scotland and Wales. A significant finding is that on average primary schools produce more than 50% more waste per pupil per year than secondary schools with an average of 26.5 kg and 15.95 kg per pupil per year respectively. When looking at the breakdown of this waste, table 15 shows that for both primary and secondary

schools, paper and cardboard form the greatest waste stream but for primary schools it is almost double that of secondary schools with an average of 15.7kg per pupil per year compared 8.4 kg per pupil per year respectively. This is where the large disparity between primary and secondary schools seems to occur. Figures 23 and 24 show the proportions of waste in primary schools and secondary schools in terms of percentages.

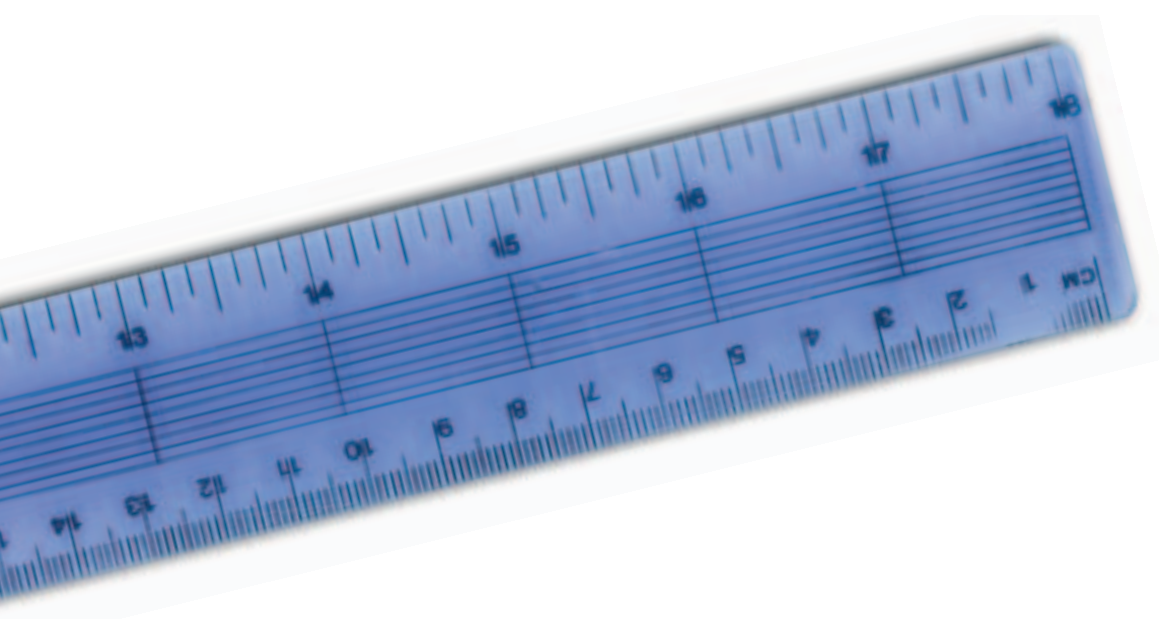


table 15 average annual waste arising in participating schools (confidence values are shown in parentheses at 95%)

type of material (kg/pupil/year)	primary schools	secondary schools
paper + cardboard	15.7 (9.5 – 22)	8.4 (6.1 – 10.7)
metal	0.8 (0.6 – 1.0)	0.6 (0.4 – 0.6)
glass	0.7 (0.5 – 0.9)	0.25 (0.2 – 0.3)
plastic	3.3 (2.5 – 4.0)	2.2 (1.9 – 2.4)
food + green waste	3.5 (2.3 – 4.6)	3.2 (3.0 – 3.3)
other	2.5 (1.9 – 3.4)	1.3 (1.0 – 1.5)
total	26.5	15.95

figure 23 main types of waste generated by primary schools

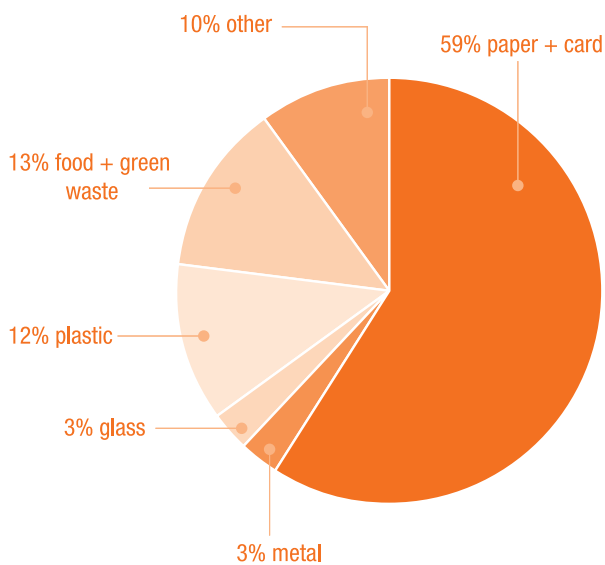
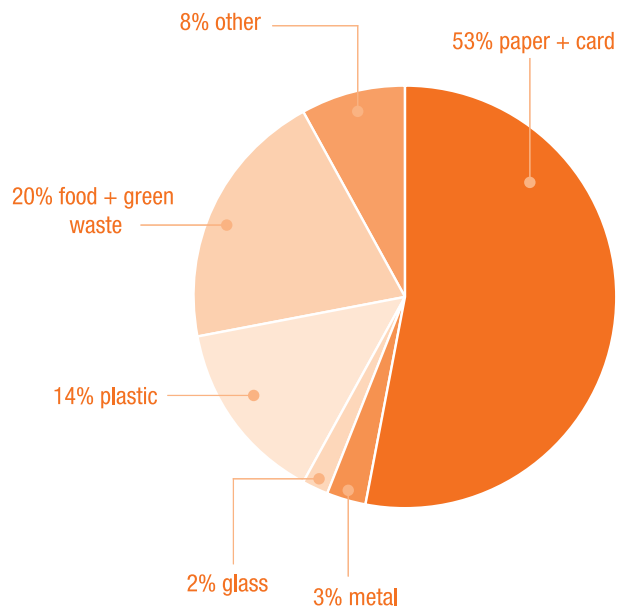


figure 24 main types of waste generated by secondary schools



Regionally schools produced varying amounts of waste. For instance, schools in the South East, East Anglia and the West Midlands produced more waste than other schools in the UK even when the number of children they taught was taken into account.

The study also found that, on average, urban schools produce more waste than rural ones, even when the number of pupils is taken into account.

However, schools which place more emphasis on waste related issues such as litter also generally have more success in reducing waste. From the study it seems that generally rural schools felt that litter was one of their more significant environmental impacts compared to urban schools (and therefore in taking actions to reduce their environmental impact are more likely to tackle litter [and waste] than urban schools).

table 16 the total waste arisings in the FHE sector and the proportion of sampled establishments that have implemented recycling schemes (confidence values are shown in parentheses at 95%)

	FHEIs
total waste arising for the FHE sector based on audit findings (tonnes/yr)	488,654 (180,429 – 1,323,416)
average amount of waste produced per site* (tonnes/yr)	929 (343 – 2516)
proportion of sites sampled with recycling schemes	78%

* this is an average figure based on data from all sites. It should not be used as a benchmark figure

4.6.2 FHEIs

As part of this study, 13 waste audits were carried out at FHEIs in England, Scotland and Wales. Similar to the findings in schools, these audits revealed that increasing the number of students also increased the amount of all types of waste produced in FHEIs. This finding was particularly pronounced for paper and cardboard, plastics and office equipment. Additionally, larger numbers of staff meant that a greater amount of compostable waste was generated.

Table 16 shows the total waste arisings produced by the FHE sector in England, Scotland and Wales, according to the findings of the study, along with

the proportion of establishments that have some sort of recycling schemes.

Figure 25 shows the average proportion of the main types of waste generated by the FHEIs surveyed (including students' unions, offices and buildings used for teaching). As with schools, it shows that by far the greatest proportion of waste is paper and card with compostable waste making up the second largest component. Table 17 represents these findings in terms of their actual amounts for the main categories of waste produced across the principal types of college and university building that were audited. 95% confidence intervals are shown in parentheses.

figure 25 main types of waste produced by FHEIs surveyed

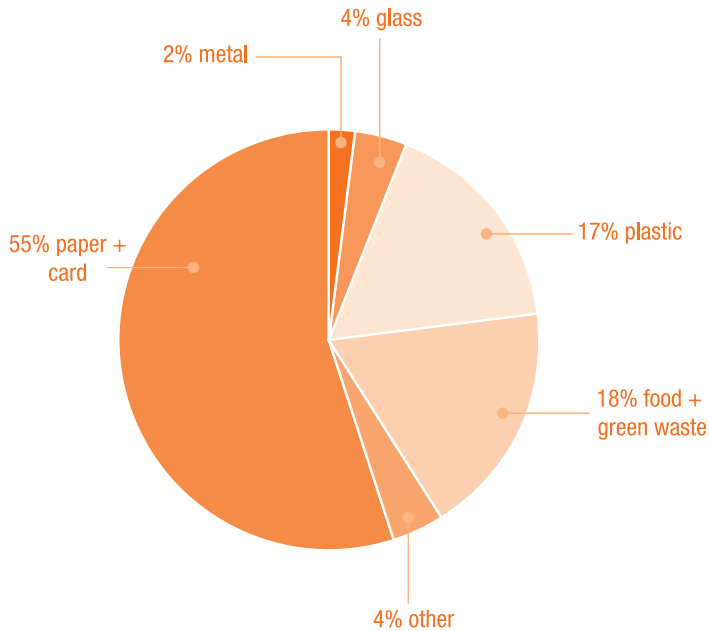


table 17 main types of waste generated (by weight) by principle types of buildings in FHEIs surveyed

type of material	average amount of each type of waste generated by each student across the sampled FHE sites (kg/student/year)
paper + cardboard	56 (21 – 152)
metal	2 (0.7 – 5.4)
glass	3.5 (1.3 – 9.5)
plastic	17 (6.3 – 46)
food + green waste	18 (6.6 – 48.7)
other	3 (1.1 – 8.1)
total	99.5

5 – analysis and discussion

This section analyses and puts the results from the study into context. Recommendations relevant to the findings and discussion are given in section 6.

5.1 environmental management

Good environmental practices are generally associated with some level of environmental management being in place which is well integrated and, most importantly, well communicated. Several areas from the audit highlighted environmental management practices and as shown, there were mixed results from the participating establishments from both sectors. The fact that so many sites monitored some impacts, such as energy and water use, could suggest that the education sector increasingly recognises its own environmental impact, both in terms of ‘invisible costs’ such as energy and transport (greenhouse gas emissions for instance) as well as ‘visible’ capital costs such as waste disposal.

However, only 24% of schools and 46% of FHEIs carried out any environmental training for their staff, which is an area that can have a large positive effect on attitudes and awareness of environmental issues. Training encourages staff to take action on the environment and ensure any initiatives are fully embraced thereby fostering a culture which students will adopt. As 87% of the schools surveyed carry out awareness work with their students, improved staff awareness and training would ensure that students increase their awareness of environmental issues further.

Participating establishments identified a number of barriers to improved environmental performance. Even though, as mentioned previously, a large proportion of schools carried out awareness work with their students, lack of awareness was the third most commonly cited barrier in schools and the second most common in FHEIs. This could be seen as a limiting factor in improving the sustainability of the education sector and, as already discussed, staff training may help address the awareness

barrier as well as bringing other benefits.

Participation in formal environmental initiatives was around 50% for both sectors. Initiatives such as Eco Schools and Waste Watch’s SWAC (for schools) and EAUC or HEEPI membership (for FHEIs), help establishments take action to improve their sustainability.

Staff time and funding were the top two cited barriers in schools whereas the latter was the key barrier for FHEIs

Ensuring responsibility is taken for the environment is an important factor when considering improving the sustainability of the sector. From the study it was concluded that the main determinant of whether any environmental action was undertaken was whether there was an environmental champion (official or otherwise) who took responsibility for organising environmental initiatives and maintaining initiatives. Similarly for FHEIs (especially universities), establishments that had the most advanced environmental policies, management and measures in place, had a full time environmental coordinator. This strongly suggests that if an establishment is to move forward in terms of its environmental policies and initiatives, a coordinator, even in just a voluntary capacity, should be assigned to take responsibility for this area.

5.2 procurement

Procurement is being increasingly recognised as an important area of sustainability in all sectors and the products and services an organisation buys are now being seen as an indicator of its commitment to sustainable development. The sheer scale of the education sector means that procurement in the sector has the potential to be an important tool for achieving sustainable development objectives in the UK. There are also reputational benefits to be gained through buying more environmentally friendly products as environmental issues come to the forefront. There are often financial benefits of

moving to more sustainable products too when taking the whole life cost of a product or service into consideration (see whole life costing section below). To this end a number of initiatives have been established in the sector to address green procurement issues. A number of organisations that are working in this area are listed in the further information and contacts section which can be found at the end of this report in appendix 5.

However, the study found that green procurement in the sector was not common place, for example, only 2% of schools and 8% of FHEIs had a formal policy to buy recycled products and barriers such as cost were commonly cited. It is clear that this is an important area to address in the future and it is necessary to look at green procurement in further detail.

5.2.1 what is green procurement?

The aims of sustainable/green procurement are to achieve the normal goals of procurement such as sourcing the most appropriate goods at the best value, but in ways which maximise environmental and social benefit. These aims can be summarised as sourcing products and services which

- reduce waste and improve resource efficiency
- secure the appropriate supply of goods and services
- ensure cost savings/value for money
- enhance the institution's image
- create/support green markets
- satisfy stakeholder expectations eg students³⁶

It is also important to take the supply chain into account, persuading suppliers to change their own production and procurement practices is another way of increasing the sector's environmental performance (this is discussed in further detail below).

5.2.2 barriers

In practice sustainable procurement is unlikely to

happen if it involves greater expense, or if it is very difficult to implement³⁷. Therefore in common with other sectors there are a number of potential barriers to green procurement in the education sector which include

- decentralised purchasing structures, particularly in the FHE sector, which may not facilitate information sharing, for example, about the performance of more sustainable products
- lack of information/knowledge/understanding
- lack of drivers to move to greener procurement practices
- perceived barriers – price, availability, performance
- real barriers – cost of change, knowledge gaps, risk aversion

Fortunately, experience shows that most establishments can overcome these constraints, especially when whole life costs are taken into consideration.

Whole life costing takes account of the total cost of the equipment or service from the determination of the general need for it, right through to its eventual disposal, termination or replacement. It includes the cost of acquisition and of maintaining and operating the equipment or receiving the service, as well as the purchase, rental or lease price and the price of consumables. In many cases the initial purchase price is well under half of the whole life cost. For example, energy efficient light bulbs are more expensive to buy than regular bulbs but use up to one-fifth of the power and last eight times longer. This means lower energy and waste disposal costs. A whole life costing tool is available at http://benchmarking.procureweb.ac.uk/wlc_index.html

In terms of perceived barriers it is important to note that low price does not guarantee performance, longevity or the ability to go beyond existing regulations or meet new ones when they are

³⁶ www.heepi.org.uk

³⁷ www.heepi.org.uk

enforced. In addition, advances in technology now mean that environmental products such as recycled paper are of a similar (or better) quality as their non-sustainable counterparts and are often a similar price. It is recommended that organisations negotiate with suppliers to get comparable quotes for environmentally preferable and less environmentally preferable products as this can result in similar prices for both types of product. Taking the whole life cost of a product or service generally reveals that the environmentally friendly alternatives are more cost effective in the long term.

There are also a number of organisations that can provide information and help in this area such as the Sustainable Supply Chain Forum (SSCF) www.greensupply.org.uk. The Chartered Institute of Purchasing and Supply (CIPS) has produced a guide on environmental purchasing in practice which is available to download from their website www.cips.org/BigPage.asp?PageID=647&CatID=205

5.2.3 catering purchasing

Improving the sustainability of catering practices begins with purchasing. Both where food and catering consumables have been procured from and the types of resources purchased are important factors when considering sustainable catering.

The Public Sector Sustainable Food Procurement Initiative was established by the Department for Environment, Food and Rural Affairs (Defra) in 2003 to help deliver the government's strategy for sustainable farming and food. Along with waste, energy and nutrition, one of the key focus areas of this initiative is to encourage a greater number of public sector organisations, including schools and colleges, to source locally produced, seasonal food. This has the dual benefit of reducing the environmental impact involved in long distance transport of food (reducing 'food miles') whilst stimulating the local economy. Many of the schools

(especially secondary schools) and the majority of FHEIs that took part in this project contracted their catering out to an external supplier, which may initially present barriers to improving the sustainability of catering practices. However, this can be overcome with careful and on-going communication with the contractor and suppliers.

The type of food purchased is important in influencing the sustainability of catering practices. The study found that primary schools bought more fresh produce than secondary or FHEIs. This might be due to the generally smaller size of primary schools and also due to initiatives such as healthy schools (whereby school children receive free fruit). Larger establishments appear to buy more packaged processed food as these are often easier to prepare and last for longer. However, such products may be of a lower nutritional value and are associated with larger volumes of packaging and waste compared with lower packaged and less processed alternatives. Additionally, it is suggested that poor diet resulting from the regular consumption of highly processed food might contribute to low energy levels and concentration amongst students. The nutritional value of food is a topical issue at present, with much concern about the growing incidence of obesity amongst young people. By moving away from processed convenience foods, which tend to have high salt, fat and sugar contents, towards including a greater proportion of fresh fruit and vegetables in their meals, establishments can make a positive contribution to addressing this issue. It is important to note that the healthy schools initiative has the potential to reduce packaging waste particularly if it is delivered in reusable packaging and can reduce the waste it produces further if the fruit waste is composted.

5.3 utility use

5.3.1 energy

Annually the UK school sector spends £400m on

energy with the FHE sector in England alone spending £200 million. Most energy production involves the combustion of fossil fuels which results in the production of greenhouse gases such as CO₂ and consequently it is a key factor in climate change. Under the Kyoto protocol, the UK is committed to reducing its domestic CO₂ emissions by 20% of 1990 levels by 2010³⁸. It is therefore imperative that the sector takes measures to achieve and exceed this as it will thus be in a good position to anticipate future, more challenging, targets.

With regards to the results of this study it was noted that primary schools use less than half the amount of gas per pupil per year than secondary schools and a third less electricity. This may be partly due to the fact that secondary schools often occupy a greater area per pupil than primary schools (therefore consuming a greater amount of energy), have larger areas such as gyms and drama studios and tend to have a greater amount of energy powered equipment such as kilns, design and technology equipment and PCs.

Efficiency is clearly of importance to the sector as it has the potential to reduce both environmental impact (as mentioned previously) and costs. Considering that energy use is potentially the most controllable aspect of an establishment's budget, energy efficiency can save educational establishments a considerable amount of money. Case studies have shown, for example, that for typical buildings in the sector, energy costs can be reduced by as much as 25% without major capital expenditure³⁹.

However, the results from the audits show that only 9.5% of participating schools and 13% of FHEIs had targets or active initiatives in place to reduce their energy use. Whilst many of the surveyed schools and FHEIs did monitor energy use, fewer than 10% of schools and 15% of FHEIs stated that they set targets or took active measures to reduce

their consumption. Addressing this and having achievable targets in place could help educational establishments attain real energy savings.

Understanding where energy is consumed and identifying excess consumption is vital to making reductions in energy use and fuel bills. Based on the findings of this study and others like it some practical sector-specific recommendations for assessing energy performance are discussed in more detail later in this report to help institutions achieve this aim.

By considering energy efficiency, establishments can anticipate future regulation and immediate action taken on energy will stand institutions in good stead if increased energy taxes are introduced. Fiscal measures seem increasingly likely if the government is to meet its ambitious targets of reducing CO₂ emissions to 20% below 1990 levels by 2010 and 60% below 1990 levels by 2050⁴⁰. Aside from reduced consumption costs, there are other cost benefits to reducing energy usage. Reducing the use of electrical equipment also potentially extends its lifespan. Setting targets and being seen to be taking positive action to reduce energy consumption potentially enhances the reputation of a school or FHEI with both parents, students and the wider community.

5.3.2 water

The findings from the audits show the environmental impact of water consumption is often underestimated, especially by schools, and consequently water saving measures are not commonplace, although they are more frequent in FHEIs.

Water consumption is often seen as a fixed overhead by many establishments. However, as already shown, it represents a considerable cost to the sector as a whole and the environmental impacts of water consumption are numerous. Each cubic metre of water used requires 0.4 kWh of electricity to treat and pump it to the user and a

³⁸ www.number-10.gov.uk/output/page3072.asp

³⁹ *Action Energy (2004) Energy Efficiency in Further and Higher Education, Action Energy*

⁴⁰ www.heepi.org.uk

similar amount is needed to pump and treat the resulting sewage or foul-water. A reduction in water use offers considerable environmental benefits in terms of reduced greenhouse gas emissions, as well as benefiting rivers and aquifers, together with the associated flora and fauna. There are also obvious cost benefits associated with water reduction for educational establishments. As with energy consumption, water use should be monitored in order to provide a baseline to monitor any progress against. This could also identify areas of excessive or unusual consumption.

The water consumption results from this survey show that primary schools consume almost two thirds less water than secondary schools (7m³ per pupil per year compared with 11m³). This could partly be explained by the fact that secondary schools have a greater range of water use activities such as science laboratories, DT and art studios and sports showers. The fact that secondary schools use as much water per student as FHEIs could be due to several reasons. One possible explanation is that students spend more time at secondary schools over the course of a day than FHEIs (a full day as opposed to a half day session). Due to their generally larger size, FHEIs may also be more conscious of the greater cost of water consumption and therefore implement more water saving measures and initiatives. However, the small sample size for this data set should be considered when analysing this data. Further study would need to be done in this area to make more solid conclusions.

5.4 waste

Along with increasing statutory requirements strong environmental, economic and social drivers have pushed waste management further up the agenda. The true costs of waste are being realised and as such many organisations are taking at least some measures to tackle their waste production. The results show that 78% of participating FHEIs and 48% of schools undertook some sort of recycling

which made it by far the largest environmental initiative to be implemented in all establishments. This could reflect the large focus that waste issues have been given in recent years, along with the fact that recycling is a relatively simple environmental measure to implement. In drawing these conclusions, it is important to consider that improvement may be unusually high because establishments selected themselves for this study; there is likely to be an element of positive bias in these results. Effectively, the sites that took part may be more predisposed to recycle than the norm.

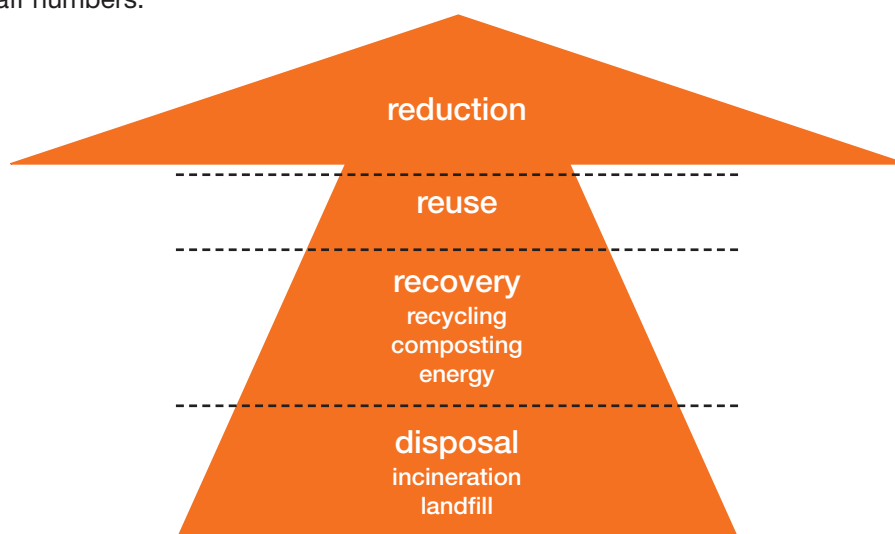
However, the fact that for all types of establishments recyclable paper and card made up over half of waste produced means there is greater potential than is being currently realised for waste to be recycled by the sector. Similarly, around a fifth of the waste from all establishments was compostable waste. When the other waste fractions are taken into account the sector has the potential to recycle or compost the majority of the waste it produces meaning that one of the main environmental impacts of the sector could be greatly reduced.

In order for recycling schemes and initiatives to be fully utilised they need to be effectively communicated so that staff and students are regularly reminded of them. Any establishment wishing to implement recycling should be aware of this along with having a clear idea of who has ownership and responsibility for the recycling scheme. This ties in with environmental management which was discussed earlier in this section.

However, when considering waste management it is the general consensus that while recycling is certainly better than waste disposal, organisations should aim to minimise their waste from the outset in line with the waste hierarchy (figure 26). Not producing any waste in the first place is the best

option environmentally and economically. This survey shows that, unsurprisingly, as staff and student numbers increase there is an increase in the total amount of waste produced. If educational establishments are committed to reducing the environmental impact of their waste production, waste minimisation should be the first consideration by decoupling waste production from student and staff numbers.

figure 26 the waste hierarchy



source Wastebusters Ltd (1996) Green Office Manual

The fact that primary schools produce 60% more waste per pupil per year than secondary schools is attributed to the fact that they produce almost double the amount of waste paper and cardboard per pupil than secondary schools. Whilst this may seem like a large disparity, there could be several reasons for this. Secondary schools carry out more PC and IT based work than primary schools which negates the need for paper. Primary schools do more activities that require large amounts of paper and card such as arts and crafts and big projects which involve paper displays. These results would appear to contradict the data that shows that participating primary and secondary schools annually purchased similar amounts of paper per pupil. However, it should be considered that this survey only monitored A4 white paper purchases and not other types of paper. It may be that

primary schools purchase more of other types of paper, such as A3 and coloured paper, which contributes to the greater amount of waste paper created from primary schools but is not registered under paper purchases in this survey. In addition, card is included in the 'paper' category in the waste stream analysis but card purchases were not recorded.

According to the results, the FHE sector produces significantly more waste annually per pupil than both primary and secondary schools (99.5 kg per student compared with 26.5 kg for primary and 15.95 kg for secondary schools). However, across all establishments the waste was of a similar composition. Initial explanations for the comparatively greater waste production per student in FHEIs with regard to paper could be that

students at these establishments print more documents than students in schools. FHE students generally work independently and require more photocopying and printing to carry out their work than school students. However, the major reason will be that the waste audits carried out at FHEIs during this project included living areas such as halls of residence and social areas such as student unions and bars. These establishments will clearly produce more waste than those that are only occupied for a certain number of hours per day. In this respect schools and FHEIs are not comparable.

5.4.1 catering waste

If educational establishments are attracted by the convenience associated with packaged alternatives, resource use and waste production involved with the manufacture and use of these products will increase. The amount of food packaging is generally increasing, which means an increase in resource use and waste production. When considering waste minimisation, catering practices as well as catering procurement are important. To reduce the amount of waste associated with catering, the use of disposable items should be minimised.



6 – recommendations and case studies

The following section draws on the audits from this study to give examples of good practice within schools and FHE sectors. Based on these, recommendations are made of how establishments can reduce their environmental impact. Case studies are given from participating establishments, Waste Watch's wider work with schools and also from documented cases of best practice.

6.1 good environmental practice in schools

environmental policy and management

- engaging in national and local environmental initiatives such as the Waste Watch SWAC programme and Eco Schools
- pupils are involved in environmental clubs or societies
- staff are encouraged to take action on environmental impacts, such as paper use

purchasing

- environmental criteria are included in purchasing decisions
- suppliers are sought locally
- there is regular communications with suppliers
- secondhand, reused or reusable resources are purchased on a regular basis
- where available and cost effective, products with recycled content are bought as standard
- recycled products are trialled
- accurate and comprehensive records of purchasing data are maintained
- catering supplies are locally sourced
- fresh food is purchased as much as possible as opposed to over packaged, processed foods

energy and water management

- energy and water consumption is monitored continuously and thoroughly
- initiatives are in place to reduce energy and water use, such as 'switch off' campaigns
- changes to infrastructure are made to improve efficiency such as energy saving lighting and heating insulation

- electricity supply is switched to renewable sources

waste management

- redundant IT equipment is donated to reuse organisations
- items of furniture are reupholstered to prolong their life
- doublesided printing and photocopying is routine
- staff are encouraged to save documents electronically rather than printing out in hard copy
- use of scrap paper pads is commonplace
- paper recycling facilities are used regularly
- commonly used resources such as print cartridges are reused or recycled
- waste and recycling initiatives are communicated regularly to staff, children and parents
- use of disposable catering items such as plastic cutlery and lunch trays is avoided
- catering supplies are delivered in plastic crates which are returned to the supplier for reuse
- composting of waste fruit and peelings. Composting activities are incorporated into science lessons or eco/gardening clubs

6.2 practical recommendations for schools

environmental policy and management

- develop your own environmental initiatives
- communicate messages clearly to let all staff and pupils know about current initiatives. Publish a plan of action around the school with some targets and some posters showing your progress against these
- set up an environmental club to take responsibility for initiatives and increasing communication
- communicate your environmental work and initiatives to parents and the wider community, for example through newsletters and community notice boards

- engage the student council in making decisions on environmental improvements
- where possible link curriculum based activities and lessons with practical action in school to work environmental issues deeper into the curriculum and to reinforce the messages for pupils

purchasing

- include environmental criteria in purchasing contracts and work closely with suppliers to overcome any barriers
- include recycled products on core stationery lists
- strive to achieve best value in your purchases – remember that the lowest price does not necessarily mean the lowest costs in the long term or in terms of efficiency, lifespan or environmental performance. An example of a best value purchase is an energy efficient light bulb; the bulb’s performance outweighs its initially higher cost by using less energy and lasting longer than a standard bulb⁴¹
- ask suppliers to give quotes for recycled products and compare them to those for non-recycled ones
- provide purchasing staff and budget heads with guidance about environmentally preferable purchasing

catering purchasing

- work closely with your catering suppliers in trying to source local produce
- try to purchase in bulk wherever possible. Items such as non-perishable foods and sauces are ideal for bulk purchase and are a good way of reducing packaging
- avoid purchasing individually packaged or over-packaged items such as sauce sachets and pre-made cakes. Highly packaged and processed foods tend to be associated with higher fat, sugar and salt contents
- reduce the purchasing of paper plates and plastic cutlery and cups; reusable items are a

much more environmentally beneficial option

waste

- take steps to reduce and reuse the materials your school uses⁴²
- improve methods of recording how your waste is managed. Ask your contractor to provide you with a breakdown of the total weight of materials which are disposed of and/or recycled each month. This will allow for comparisons to be made over time
- look into extending paper recycling schemes to include all paper types
- work with your local authority to introduce recycling schemes for cardboard, cans and plastic bottles
- generate enthusiasm for the recycling schemes by communicating how everyone can play their part and how they can benefit their environment by doing so
- provide incentives to recycle, for example using league tables for class recycling
- switch to using mugs and glasses in the staff room instead of disposable vending cups
- start composting any uncooked fruit, tea bags and coffee grounds, which have not come out of the kitchen and use them to fertilise the school grounds. This is a great way to get the pupils involved with the environment and is also a valuable educational tool. If a school is participating in the National School Fruit Scheme, composting is an ideal way of minimising waste.
- start a collection scheme in the office for used printer and photocopier cartridges. These schemes are often run by charities so implementing such a recycling programme will not only benefit the environment, but the charity as well

catering waste

- work with your supplier to have deliveries made in reusable crates and pallets which can be returned, rather than using cardboard boxes

⁴¹ for more information about best value in schools refer to www.dres.gov.uk/valueformoney/index.cfm?action=GoodPractice.Default&ContentID=49

⁴² for practical tips on how to do this, refer to Waste Watch’s Recyclezone website www.recyclezone.org.uk

- wrap sandwiches and rolls in greaseproof paper, or less preferably clingfilm, rather than in disposable plastic containers
- packaging should be crushed or flat packed prior to disposal as this means that more material will fit into a refuse or recycling container, potentially reducing the number of collections required and therefore transport (and cost) impacts
- much food packaging and waste can be recycled including aluminium and steel cans and containers, glass bottles and jars, plastic bottles and cardboard boxes
- waste cooking oils can be collected for purification and recycling

energy and water

- appoint pupils as light monitors to switch off lights in unoccupied areas. Ask cleaning staff to switch off lights as they move from room to room
- don't overheat rooms. An extra 10°C in a room's temperature will increase a heating bill by 6-10%⁴³
- add a reminder message about energy saving to log on screens for PCs – computer monitors use two thirds of a computer's energy
- motivate your pupils and staff about reducing their use of energy and water by communicating with them regularly
- consider implementing an energy policy. The energy certification for schools scheme offers advice on how to create such a policy
- set targets for energy and water savings and monitor progress against them
- contact your water company and your energy manager at your local authority for more detailed advice about efficient infrastructure
- look into ways of reducing the amount of travel to and from the school – car sharing schemes are a great starting point

6.3 case studies

This section outlines some examples of best practice from participating schools and from Waste Watch's wider work with schools such as through the SWAC programme.

Sandfields Primary School – waste reduction success

The audit at Sandfields Primary School in Port Talbot found that the school has reduced the amount of waste going to landfill in a number of ways. Paper and many other items, including mobile phones and toner cartridges, are recycled and an innovative scheme to compost organic waste from the staff room has been introduced. The staff put their fruit and vegetable peelings, tea bags and coffee grounds into a separate bin which is then emptied into the school's compost bin on site. The school is currently developing a nature garden where this compost will be used. To complement this initiative the school also runs a gardening club so that pupils can experience first hand the pleasure of growing plants and making and using the compost.

Willows High School – green purchasing

Although Willows High School in Cardiff does not have a formal green procurement policy the audit found that it does take environmental issues into consideration when purchasing products and services. The school belongs to Cardiff County Council Purchasing Consortium which highlights the environmental credentials of its products and the school favours these products if they are found to be cost effective. The school also tries to use natural materials where possible, for example, it is looking into making benches for the playing fields from locally sourced logs. The school has also purchased motion sensors and 90% of its lighting is now motion sensitive which means when classrooms are not being used the lights switch off automatically; this is another example of best practice, reducing financial costs and improving the school's energy efficiency.

⁴³ www.teachernet.gov.uk/wholeschool/sd/focuson/energy/

St Leonard's School – reducing rubbish by 70%

Working with Recycle at School*, St Leonard's School in London started recycling paper and cut the school's rubbish by 25%. The school also signed the London Mayor's Green Procurement Code and started to 'close the loop' by purchasing recycled paper. After joining the free fruit programme the school started a composting scheme, obtaining two composting bins and small collection bins for organic waste and began trialling a large custom-built wormery. In the first 10 weeks, it took 50.5kg of fresh food waste, exceeding expected performance and creating excellent quality soil conditioner for the school's wildlife garden. By recycling paper and composting fruit waste the school has made a staggering 70% reduction in their rubbish to disposal. Please note that St Leonard's did not participate in this project.

* a programme for schools which provides fun, hands-on curriculum-linked class activities as well as practical advice and support to assist waste reduction and recycling initiatives within schools in five west London boroughs

Southdown Community Nursery and Infant School – sustainable purchasing

This Somerset school has chosen to provide its own catering services to its pupils, which has given it more flexibility in its purchasing decisions. The school has taken the opportunity to use only local shops and suppliers and sources locally grown fruit and vegetables. Through deciding its own menus, Southdown is able to offer more varied and healthy meals. The decision has been a success with over 60% of pupils opting for school meals. Please note that Southdown School did not participate in this project⁴⁴.

6.4 good environmental practice in the FHE sector

environmental policy and management

- environmental policy and corresponding action plan established and monitored for progress
- endorsement of policy by senior staff

- specific posts for environmental staff established to help implement policy-based actions
- students engaged in making decisions on environmental issues
- strong communication of policy action points to staff and students through regularly used forums (eg websites and intranets)
- active environment club or society in place

purchasing practice

- a green procurement policy in place
- sustainability criteria built into the tendering process for new suppliers
- recycled products routinely purchased instead of those derived from virgin products
- good communication with current suppliers to ensure that the needs and wants of the establishment are fully understood
- procure from centralised sources which have already established green procurement policies (such as the SUPC, see appendix 5 for more details)
- whole-life costing taken into consideration when purchasing decisions are made
- fairtrade goods sourced and sold at catering outlets throughout the university
- certain foods sourced from local suppliers
- purchasing of over-packaged and processed foods kept to a minimum

waste management

- regular measuring and monitoring of costs and quantities of waste
- pay-by-weight waste contracts in place
- strong working relationships established with waste contractors as well as local reuse and recycling companies
- forums established for the exchange of secondhand books, equipment and furniture amongst students and staff
- activities monitored to ensure that they comply with appropriate waste management procedures and environmental policies

⁴⁴ details obtained from www.defra.gov.uk

- paper reused for draft documents or scrap pads and printing credits in place to discourage excessive paper use
- catering facilities use reusable cutlery, dishes and cups
- catering waste recycled or composted as much as possible
- catering supplies delivered in crates which are returned to and reused by the supplier

energy and water management

- comprehensive energy and water policies and targets in place which are disseminated to staff
- routine monitoring and reporting of energy and water consumption
- training for employees with responsibility for energy and water
- specific budget allocated for energy and water efficiency investments
- investment in energy and water efficient infrastructure
- electricity supply switched to renewable sources
- transport policy and corresponding action plan in place to reduce energy use and resulting CO₂ emissions

6.5 practical recommendations for FHEIs

environmental policy and management

- develop an environmental policy to address direct and indirect environmental impacts across all areas of resource management. The policy should be accompanied by an annually reviewed environmental action plan which sets targets based on the policy
- ensure that all staff are aware of the policy and their responsibilities for putting it into practice
- join environmental initiatives such as EAUC. Schemes such as these provide useful information about environmental improvement and allow best practice to be shared
- communicate information on recycling services and energy and water saving measures
- incorporate environmental awareness into staff

induction and training programmes

- produce a green guide for students and publish concise environmental information in halls of residence
- use environmental policy as a unique selling point when advertising the university

purchasing

- develop an environmentally preferable procurement policy which includes a requirement to monitor performance
- communicate your green procurement policy to suppliers and work with them to identify opportunities for greening procurement. Ask suppliers for price comparisons between recycled and virgin products
- consult with key people involved in the procurement process, including any purchasing consortia associated with your establishment, about the possibility of outlining environmental criteria for suppliers in the tendering process
- communicate policy measures as widely as possible to staff and pupils
- identify product lines in which environmentally-friendly, cost-effective products are available. Provide and agree feasible but challenging deadlines for the introduction of environmentally preferable alternatives or improved environmental performance
- consider the whole life cost of products. This will allow you to identify which products represent better value in the longer term, and always consider when new equipment could be shared rather than used exclusively
- encourage purchasing staff to consider shared use of equipment at a local or regional level

catering purchasing

- extend the environmental purchasing policy to include catering
- work closely with your catering suppliers/outlets in trying to source local produce where possible
- introduce organic food options into catering outlets to capitalise on the growing popularity of

the organic market

- advertise and communicate to staff and students the benefits of eating fresh, as opposed to processed, foods
- reduce the purchasing of individually packaged or over-packaged items such as sauce sachets and pre-made cakes
- reduce the purchasing of paper plates and plastic cutlery and cups; reusable items are a much more environmentally beneficial option

waste

- measure and monitor the quantities of waste and recycling as well as the financial costs involved in their management. A pay-by-weight contract will facilitate this process. More information about measuring and monitoring waste can be found on the HEEPI website www.heepi.org.uk
- to further help measure and monitor your waste, conduct a waste audit through a student project – this can be repeated yearly to assess improved performance
- reduce the amount of potentially recyclable material being disposed to at landfill sites. Positioning recycling bins at the source point of waste generation will help achieve this. Develop a student project to identify areas that need recycling bins throughout the university
- encourage staff and students to save paper by printing and photocopying doublesided. This could be through the use of a printing credits scheme
- introduce cardboard cages to make cardboard recycling more manageable
- use old paper boxes as paper recycling bins
- work with all staff and students to ensure they take ownership of sustainable waste management policies, for example through the creation of an environmental forum

catering waste

- work with your supplier to have deliveries made in reusable crates and pallets which can be

returned, rather than using cardboard boxes

- packaging should be crushed or flat packed prior to disposal as this means that more material will fit into a refuse or recycling container
- much food packaging and waste can be recycled including aluminium and steel cans and containers, glass bottles and jars, plastic bottles and cardboard boxes
- waste cooking oils can be collected for purification and recycling
- replace vending cups with reusable ones
- investigate the possibilities of introducing composting on-site

energy and water

- assess water performance using the best practice figure for FHEIs of 0.40m³/m² given by Watermark as a guide
- assess energy performance using the Energy Efficiency in Further and Higher Education guide available from www.actionenergy.org.uk
- run energy and water saving campaigns throughout the site and maintain the momentum of the campaigns by providing regular feedback to staff and students
- train staff to save energy and water
- work with local public transport companies to make the use of buses and trains more appealing
- install energy efficient fluorescent tubes and water butts to conserve energy and water
- ask your energy and water companies to see what type of services they offer to allow better monitoring of consumption and to identify potential for practical changes to infrastructure

6.6 case studies

The following case studies are all showcasing best practice from FHEIs that took part in this study.

Craven College – developing and implementing an environmental action plan

Staff at Craven College in Skipton were very keen

to reduce their environmental impact and raise awareness of environmental issues. They began by appointing an environmental coordinator (an existing member of staff) and have recently started an environmental committee. The committee drafted an environmental policy and action plan, which is now an official document and has been published in the college handbook. One of the first actions was the introduction of recycling facilities at the main campus to tackle the college's growing amount of waste sent to landfill. There are now separate bins for paper, glass and cans and there are paper collection receptacles in nearly every room. Other measures are being taken to reduce the amount of general waste going to landfill across the college. The majority of toner cartridges are recycled, garden waste is composted and mobile phone recycling is being introduced. The recycling initiatives at Craven College have made a good start and now work is being done to encourage students and staff to use the new recycling facilities.

Oxford Brookes – an environmental university

When audited, it was found that Oxford Brookes University is implementing best practice in several areas of resource management across the university. There are a series of policy measures in place to ensure that their commitment to sustainability is formalised and adhered to. The environmental policy outlines the basic areas that the university focuses on to improve its environmental performance. There is a full time environmental coordinator who is responsible for the implementation of the policy along with a non-sabbatical environment officer at the student union. Some of the specific areas that have been addressed by Oxford Brookes are

- transport – there is a comprehensive and successful green commuter plan
- waste – there are recycling facilities for a large range of materials and products across the site as well as a 'swap shop' for unwanted items

- energy – although there is no specific energy policy in place as yet there is an on-going programme of energy efficiency improvement across the university
- communication at the university is very strong with an environmental forum held twice a term and an environmental awareness week held every two years

Plumpton College – reducing the impact of catering activities

Catering staff at Plumpton College near Lewes have made considerable efforts to reduce the environmental impact of their college's activities. There are a number of recycling schemes in place including facilities for recycling cardboard, cans, glass and plastic. The use of disposable catering items such as plastic, cutlery and paper plates is avoided wherever possible. Most deliveries are made in reusable plastic crates. Additionally, a pilot scheme is being trialled to source all fruit and vegetables from local organic suppliers. If successful, the college will move towards sourcing the majority of its food locally. Currently, a certain proportion of the meat and vegetables used by the catering department is the college's own produce. All of these measures highlight the college's drive to greatly reduce its overall 'food miles' associated with transporting catering supplies.

University of Hertfordshire – greening the supply chain

The University of Hertfordshire spends over £35,000 per year on goods and services such as computers, furniture, estates management, lab equipment, books and catering. Individually, and as part of the Southern Universities Purchasing Consortium (SUPC), the university has worked in partnership with suppliers to achieve best value. A number of initiatives have been implemented to work with suppliers, to raise awareness of the university's environmental criteria and to facilitate improved environmental performance. Some of the university's suppliers attended a seminar on

improving environmental performance. The university also contributes to the SUPC Environment Group. In addition within the university itself environmental issues are integrated into purchasing decisions, for example, any item over £2,000 is assessed for sustainability by the university's central purchasing department. The department ensures that environmental costing issues are 'considered prior to placing an order for goods and services'. These are as follows: packaging take back, recycled content, energy efficiency, water efficiency, long life, reduced transport, running costs including maintenance and disposal of spares, and end of life disposal costs.

University of Edinburgh – green purchasing structure

Equipment is an important component of HE spend on goods and services each year. Most equipment

remains in operation for long periods of time, so its lifetime operating costs, much of which are energy and water consumption, greatly outweigh initial purchase costs. In devolved purchasing structures, most equipment purchases are handled at departmental or faculty level, so it is very easy for buyers to focus on the capital costs (which come out of a grant or other academic budget) and ignore longer-term operating costs. The University of Edinburgh tackled this by training devolved purchasers in whole-life costing techniques and creating a post for a centralised capital equipment buyer. The university believes that these initiatives have already reduced the financial and environmental costs of equipment purchases and plans to extend whole-life costing to other areas⁴⁵. Please note that the University of Edinburgh did not participate in this project.



⁴⁵ www.heepi.org.uk

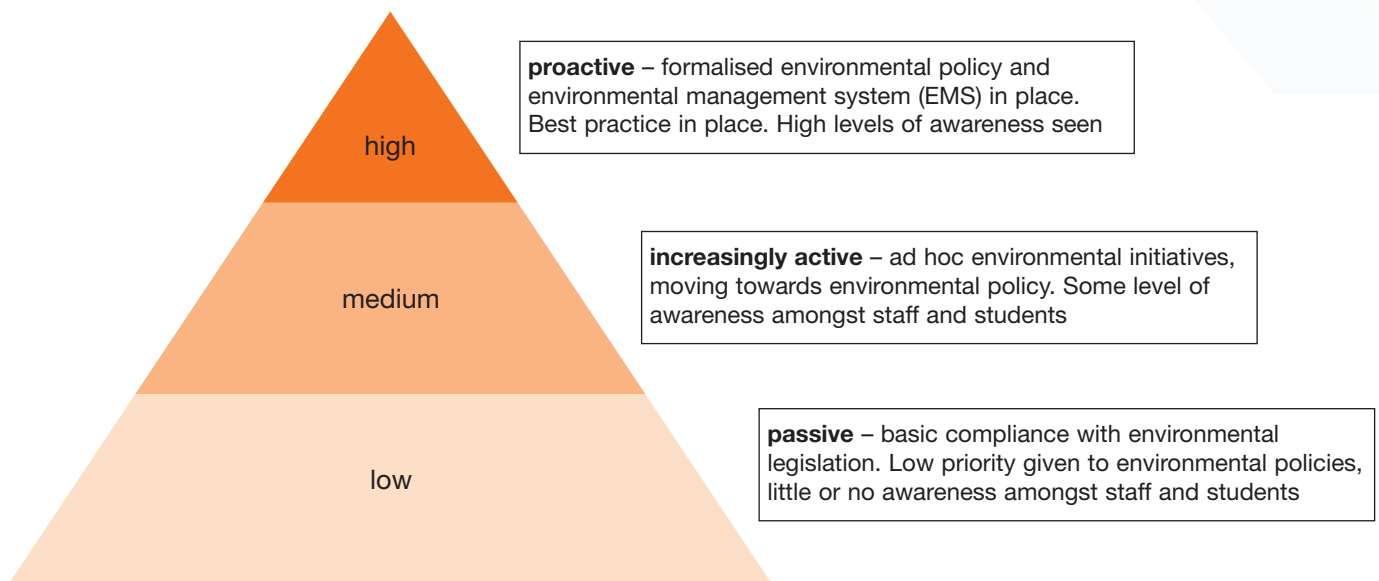
7 – putting the report in context

7.1 legislation and drivers

Along with increasing environmental and policy legislation, there are strong economic and social drivers to reduce the environmental impact of the education sector. Much of the philosophy behind sustainable development focuses on the concept of the ‘triple bottom line’. The triple bottom line encourages organisations to focus not just on economic considerations, but also on the environmental and social costs so as to minimise harm resulting from their activities.

The different levels of policy commitment to sustainability within the education sector can be visualised as a pyramid (figure 27). Many establishments, at the bottom of the pyramid, show nominal commitment whilst at the top, there are a few demonstrating best practice towards improving the sustainability of their policies (and hence their ways of working).

figure 27 the hierarchy of policy commitment to improved sustainability across the education sector



There are several benefits to being proactive in an organisation's approach to environmental management. Due to policies and practices already in place, an organisation may be able to pre-empt any future legislative requirements that may require a large cost and/or staff training input in order to improve environmental performance. By being more efficient, there will be cost savings in terms of energy and waste disposal. In an increasingly competitive market, a 'green' organisation may be more attractive to potential students and investors. The following section outlines how the triple bottom line drivers can affect the way that educational establishments operate, as well as looking at policy areas associated with education management.

7.1.1 policy and environmental management drivers

There are several policy areas which encourage sustainable practices in education.

a) sustainable development action plan

Most recent and directly applicable to the education sector is the DfES's Sustainable Development Action Plan for Education and Skills. Launched in 2003, it aims to provide guidance on how the education sector can operate more sustainably and identifies ways of improving the teaching of sustainable development. This is in recognition of the fact that the education sector as a whole

- has a potentially large environmental footprint that needs to be reduced if the UK is to meet its environmental targets and commitments
- the education sector has an inherently vital role to play in the promotion of sustainable development

The plan outlines four distinct areas: education for sustainable development, the environmental impact of the DfES and its partner bodies; the environmental impact of the education estate, and

local and global partnership activity. There are a set of objectives within each area and actions that need to be taken in order to address these. CEE is currently monitoring the progress of actions needed to achieve the aims of the plan.

b) environmental initiatives

As discussed in other sections, there are many environmental initiatives available to schools and FHEIs. Such initiatives provide useful and relevant information about environmental improvement and education and allow knowledge sharing about pertinent environmental issues. Initiatives such as the Energy Certification for Schools Scheme can also offer real cost savings for schools.

c) environmental policies

An environmental policy is a written statement outlining an organisation's main environmental impacts and its intentions to manage and reduce these impacts. Some educational institutions now have some sort of environmental policy in place, or policies relating to elements of environmental management such as waste. In the school sector, there is much attention focused on encouraging the development of travel plans to tackle the unsustainable levels of traffic congestion and air pollution seen in the UK today. Organisations for FHEIs such as EAUC can provide advice and guidance on how to formulate environmental policies and how to start to become a more sustainable organisation.

d) environmental management systems (EMS)

An EMS provides a systematic process for the identification and management of environmental impacts of an organisation and ensures the integration of environmental protection into everyday working practices. The adoption of an EMS can have many advantages such as ensuring compliance with regulatory regimes, improved image and cost savings through resource use efficiency. The EMS is a natural progression following the adoption of an environmental policy

and is more relevant to universities than schools, due to the greater amount of activity involved. Although not yet common, several universities have developed or are developing an EMS, including the internationally recognised ISO 14001. At present, there is no obligation for an organisation to produce an EMS or even an environmental policy, but there is increasing pressure to do so.

7.1.2 social drivers

Public attitudes and opinions can have significant influence on the behaviour of an organisation, and those within the education sector are no exception. At a time when there is increasing emphasis on choice, particularly with regard to higher education, taking part in environmental initiatives or the implementation of an environmental policy can distinguish one educational establishment from another and can be a more preferable choice to students or parents.

As well as the educational benefits, participation in environmental activities and initiatives can help to foster a community spirit and increase social cohesion within the wider community associated with an institution. Taking part in environmental clubs can encourage social awareness and citizenship in pupils and students alike.

On a larger scale, there are obvious social benefits to taking a proactive approach to reducing the environmental impact of your establishment. The impacts on society of unsustainable activities such as increased waste production and air pollution are well documented. Such activities can detrimentally affect the quality of life for communities. Giving waste as an example, landfill space is rapidly running out in some areas and placing landfill sites and other waste disposal alternatives such as incineration near to residential areas is unpopular. Consequently there are social pressures to reduce environmental impacts from the outset of the waste process.

7.1.3 legislative drivers

Currently, there is a comprehensive amount of environmental legislation at both national and EU levels, much of which is applicable to the education sector. Some of the most recent and prominent measures are shown in table 18.

7.1.4 economic drivers

As cost and value for money is a pressing issue in all educational establishments, the importance of economic drivers in reducing the environmental impact of the sector cannot be overlooked. There are several fiscal measures directly relevant to the education sector which are designed to promote improved practices. These work on the principle that it makes good business sense to increase resource efficiency and reduce waste production. The main areas applicable to the education sector are listed below.

a) landfill tax

First introduced in 1996, landfill tax is levied on most waste which is sent to landfill in order to encourage more waste minimisation, recycling and reuse of materials. The standard rate of landfill tax is increasing every year and in 2005 it reached £18 per tonne and is set to increase at £3 per tonne per annum after this time with a medium term rate of £35 per tonne being reached by 2012⁴⁶. The cost of the landfill tax falls directly on landfill operators but is indirectly translated to the waste producers ie the general public and businesses. Therefore waste minimisation and recycling can bring savings for an organisation.

b) climate change levy

The climate change levy (CCL) is a tax applied specifically to the energy used by industry and businesses and is designed to encourage greater energy efficiency and therefore reduce emissions. Like VAT, the tax is levied through the energy bill and can mean an increase of up to 12% in energy expenditure. Educational establishments, including schools, are not exempt from the tax and have

⁴⁶ Strategy Unit (2002) *Waste Not. Want Not – a strategy for tackling the problem of waste in England*, Strategy Unit

therefore seen an increase in energy bills since its introduction. However, there is no CCL associated with energy purchased via renewable energy suppliers so it is increasingly making both environmental and financial sense to choose a more sustainable approach.

c) other initiatives

There are several initiatives in place to promote increased efficiency across the education sector. The Energy Certification for Schools Scheme is one such scheme that offers cost savings through sustainable energy management and rewards good performance. Similarly, organisations such as the government-run Action Energy or Envirowise (applicable to both schools and universities) can give energy and waste minimisation cost saving advice which can be of real benefit to educational establishments where budgets may be tight.

7.2 the global context

There are a number of global environmental programmes taking place at school and FHE level, including the following

a) Eco Schools – worldwide

Eco Schools is an environmental management and certification programme for schools. There are about 12,000 Eco Schools in 30 countries in Europe, Africa and South America at present. The Eco Schools programme may be known by different names in different countries though they share the same methodology and concept and are identified by the Eco Schools logo and green flag. Schools are registered to Eco Schools in the following countries: Belgium, Bulgaria, Croatia, Chile, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Kenya, Latvia, Lithuania, Malta, Netherlands, Norway, Portugal, Romania, Russia, Scotland, Slovenia, South Africa, Spain, Sweden, Turkey and UK.

b) Global Higher Education for Sustainability Partnership (GHESP)

Four international organisations that are committed to making sustainability a major focus of higher education have formed a GHESP. The four founding partners of the initiative – the International Association of Universities (IAU), the University Leaders for a Sustainable Future (ULSF), COPERNICUS-CAMPUS and UNESCO – aim to mobilise universities and higher education institutions to support sustainable development in response to Chapter 36 of Agenda 21.

A memorandum of understanding has been signed to undertake joint actions in the area of higher education and sustainable development. The rationale for the partnership is the consensus that higher education must play a central role within the overall process of achieving sustainable development. The partners are convinced that the leaders of higher education institutions and their academic colleagues in all disciplines must make sustainable development a central academic and organisational focus in order to create a just, equitable and ecologically sound future. This requires the generation and dissemination of knowledge through interdisciplinary research and teaching, policy-making, capacity-building, and technology transfer. It is critical that higher education institutions understand and accept their responsibility within the broader context of social and economic development, and the building of democratic, equitable and ecologically-minded societies.

c) environmental management at Swedish universities

In 1996 the Swedish government decided that public authorities should act as role models in contributing to the long-term sustainable development of society. It was felt that the public authorities should use EMS to work towards this goal although no certification is required. Since almost all Swedish universities are publicly owned they are also a part of the project and thus were

required to produce an environmental report every year. These reports are sent to the Swedish Environmental Protection Agency and to the National Agency for Higher Education. In 2001 all educational institutions in Sweden were required to implement an EMS.

www.ingenta.com/isis/searching/Expand/ingenta?pub=infobike://mcb/249/2004/00000005/00000001/art00008

d) COPERNICUS

The Cooperation Programme in Europe for Research on Nature and Industry through Coordinated University Studies (COPERNICUS) was launched by CRE, the predecessor of the European Universities Association (EUA), in 1988. Today COPERNICUS is an independent organisation with a close link to EUA. The target is to involve committed European universities into this European network to share the knowledge and expertise in the field of sustainable development. Furthermore, COPERNICUS encourages partnerships of universities with industry and management. The main instrument for furthering this commitment on the part of universities is the COPERNICUS University Charter for Sustainable Development, drawn up in 1993 as a follow-up to CRE's urgent appeal presented at the 1992 Earth Summit in Rio. The charter has been signed by more than 300 universities in Europe to date. The constantly growing number of COPERNICUS universities constitutes an excellent perspective for the future development of the network.

www.copernicus-campus.org

e) The GLOBE Programme

The GLOBE Programme is an international environmental education project that encourages children in schools to explore, measure and collect data about their local areas and report their findings over the internet. The programme links students and scientists in 104 countries as they collect data about their environment and enter it onto the GLOBE database. The data contributes to

their understanding of the environment and their impact upon it. The programme covers several distinct areas; weather and climate, hydrology, land cover and biology, soils, and sustainable development. Once entered, GLOBE uses their data to provide free images, maps and graphs on the state of the planet. All raw data can also be downloaded to compare and contrast local and global environments. GLOBE schools can also communicate with each other around the world using the in-built 'GLOBE mail' encouraging international links and joint projects. GLOBE has three main objectives

- to enhance the environmental awareness of individuals worldwide
- to increase scientific understanding of the earth
- to provide opportunities for pupils to achieve greater standards in science, numeracy and ICT

www.globe.org.uk

7.2.1 other studies

A number of studies and initiatives have been conducted on resource use in, and the environmental performance of, the education sector. It is hoped that the findings of this report will complement past and existing initiatives, some of which are outlined below.

a) SWAC

SWAC is a structured education programme for primary and secondary schools, linked directly to national curriculum requirements. SWAC schools achieve an average rate of waste reduction of 47%, some as high as 90%. Developed with input from teachers, local education authorities and waste departments it is continually reviewed and improved. Since 1998 SWAC has worked in over 1000 schools through nine projects in Stockport, York, Essex, Bexley, North Yorkshire, Cheshire, Lincolnshire, Nottinghamshire and Rotherham.

www.wastewatch.org.uk/education

b) Global Action Plan – Action at School

Since its creation, Action at School has been run in

145 schools and 143,360 students have participated. Action at School helps participating schools to achieve environmental and financial savings through reductions in waste, energy and water as well as increasing the use of public transport. The programme is split into four modules and participating schools select the module they want to address. Each module lasts between two to three terms and all contain a number of elements including direct and on-going support from the programme manager. Measurement is an integral part of the process and results are used to motivate participants, highlight value for money, celebrate achievements and establish a baseline for continuing improvement. The programme is linked to the national curriculum and students design and implement their own plan of action with the support to enable them to take this role effectively. Schools receive teacher supply costs to ensure that teachers have the time to participate in Action at School.

www.globalactionplan.org.uk/index.cfm?TERTIARY_ID=0&PRIMARY_ID=33&SECONDARY_ID=41

c) SEAM Project

Schools Environmental Assessment Method (SEAM) was first published in 1996 as a method of assessing how 'green' school buildings are in operation. It has recently been updated as an on-line self-assessment tool in line with the sustainability action plan with the new updated version piloted in September 2004. SEAM is readily usable by school personnel to assess the broad sustainability credentials of their current school buildings, and highlights how to improve environmental management within schools. For new build schools, and for major retrofits and refurbishments, SEAM is developing a special school focused version of the established Building Research Establishment Environmental Assessment Method (BREEAM) which is widely used in other types of building.

www.teachernet.gov.uk/wholeschool/sd/focuson/sdevironment/seam/

d) HTI Think Leadership study

Formed as a national charity in 1986, HTI (Heads, Teachers and Industry) is dedicated to raising standards of leadership and management in education. HTI is committed to providing school leaders with up-to-date information and training to ensure that UK schools will be at the leading edge of sustainable development. HTI Think Leadership provides educationalists with a range of information including case studies, information booklets and ways to evaluate a school's performance.

www.thinkleadership.org.uk/home.cfm

e) the Carbon Trust

The Carbon Trust, a government-funded programme, helps businesses and public sector organisations save money through energy saving, from simple tips to in-depth advice and on-site support. UK schools spend around £350 million a year on energy, which is used mainly in heating, lighting, hot water, catering, and, increasingly, for IT. Improving energy efficiency in schools can reduce energy bills and improve a school's environmental performance. There are opportunities to include energy efficiency within the curriculum and to use pupils as energy monitors, ensuring that good housekeeping practices are implemented. Energy features in a number of subjects and can act as a cross-curricular theme for many school projects and the existing energy systems can be used as real life examples for classroom activities.

www.carbontrust.co.uk

f) Higher Education Partnership for Sustainability (HEPS)

Through HEPS, Forum for the Future have been working with 18 universities and colleges to deliver excellent education in a way that boosts sustainable development. Universities can make a significant contribution towards sustainable development and Forum for the Future's partners

have been developing green buildings, cutting emissions and improving the curriculum.

www.heps.org.uk

www.forumforthefuture.org.uk/aboutus/HEPS_page1509.aspx

g) Greening Britain's Schools

With partners Maverick Power, SIEnA conducted a study into the environmental impacts of schools in the UK and the opportunities for the sector to help move the UK towards sustainable development.

The project was funded through landfill tax contributions from Biffaward. The resultant report – Greening Britain's Schools – highlights the scope

for schools to improve their resource efficiency, with important benefits for their own performance, as well as national environmental, social and economic gains. Many drivers and barriers to effective implementation are the same as in the private sector, but there are also specific policy considerations for schools; the report explores many of these issues. Nationally, all sectors of society – households, businesses and the public sector – are being asked to play their part in building a more sustainable future with economic, social and environmental well-being for all. The report forms an important part of this process.

table 18 waste and energy legislation which applies to the education sector

waste legislation which impacts on the education sector

EC Landfill Directive 1999

Implemented through the Pollution and Prevention Control Act 1999 and the Landfill (England and Wales) Regulations 2002, the Landfill Directive imposes limits on the types of waste that can be landfilled. The main features are

- targets placed on the amount of biodegradable waste that can be landfilled. For the UK this is a 25% reduction by 2010
- restrictions on co-disposal of hazardous and non-hazardous wastes
- greater sorting and pre-treatment of waste prior to landfill

This directive is tied in with landfill tax (see section on economic drivers).

Environmental Protection Act 1990

Part 2 of this act states that whilst on site, waste must be stored in a way that prevents it from causing damage to the environment or human health. It therefore must be stored in a suitable container. A further section of the act lays out requirements for the management of litter with which education establishments must comply⁴⁷.

Duty of Care Regulations 1991

These regulations supplemented the requirements laid out in the Environmental Protection Act 1990 on the duty of care that all those who import, treat, produce and dispose of waste must adhere to. Transfer of waste must only be carried out by authorised people and a transfer note for the waste must be obtained. This is applicable to all educational establishments.

⁴⁷ EAUC (2001) *A Practical Guide to Waste Management for Universities and Colleges*, EAUC

Waste Electrical and Electronic Equipment (WEEE) Directive 2003

The directive, which was translated into UK legislation in 2005, is one of a number of pieces of producer responsibility legislation which continue to tackle products which are causing increasing waste problems. The WEEE directive was prompted by concern about the growing amount of waste electrical equipment. It aims to reduce the amount of waste electrical equipment sent to landfill by requiring that separately collected equipment be treated and recycled or recovered.

Animal By-Products Regulations (ABPR) 2003

The ABPR came into force on 1 May 2003. The main aim of the ABPR is to reduce the risk of the transmission of disease to humans and animals. The waste disposal industry, food manufacturing premises and catering outlets are amongst those affected by the regulations.

Hazardous Waste Directive 91/689/EEC

This directive provides a framework for the controlled management of hazardous (special) waste arising from member states. The Hazardous Waste Directive was implemented in the UK through the Special Waste Regulations 1996 (as amended). The regulations specify procedures to be followed when disposing of, carrying and receiving hazardous waste. Hazardous wastes are classified by the European Waste Catalogue which is expected to be fully implemented in the UK through the revised special waste regulations. This will bring many items not previously categorised as hazardous within the regulations including fridges, computer monitors and fluorescent tubes.

energy legislation which impacts on the education sector

targets

A target referred to in the 2003 Higher Education Funding Council for England (HEFCE) Energy Management in Higher Education report for schools indicated that carbon emissions in schools will aim to be reduced by 10% of 2000 levels by 2010⁴⁸. No specific target has been set for the HE sector, although indications made in the same report suggest that the DfES is likely to encourage the HE and FE sectors to set measurable indicators for energy use, such as reductions in carbon emissions.

Energy Performance of Buildings Directive 2003

This directive is due to be implemented in the UK by 2006 and specifies that all buildings will be assessed as to their energy performance and regular inspections of boilers and air conditioning systems must be carried out. Buildings will be issued with an energy certificate which will allow a comparison of building energy efficiency. For large public service buildings the certificate will have to be on public view⁴⁹.

⁴⁸ Higher Education Funding Council for England (HEFCE) (2003) *Energy management in higher education*, HEFCE

⁴⁹ UK Value for Money Steering Group (2003) *Energy Management in the Higher Education Sector*, UK Value for Money Steering Group

8 – conclusion

This study has shown that whilst efficient resource management in the education sector and general awareness of environmental issues are becoming more prevalent, there is still a considerable amount of work to be done in this domain. The scope for raising awareness amongst students is also huge. The study found that there are a variety of ways to improve resource management and raise awareness. For example, having an environmental champion(s) generally increases the amount of environmental activity in an establishment. Regular monitoring of utility use also allows establishments to better manage their resources, especially when combined with energy/water saving initiatives.

Whilst the data on waste was limited in some areas, it is clear that the sector produces a significant amount of waste, particularly recyclable items such as paper. There is considerable potential to both

reduce and recycle this waste, particularly as the sector currently recycles less than half. The purchasing habits of the sector also have an important role to play and it is vital that whole life costs and environmental impacts, including packaging and disposal method, are taken into consideration during the purchasing process.

It is important to note that the findings of this study have been limited by the amount of data that was available at the participating establishments. In order to gain a more in-depth insight it is necessary for schools, colleges and universities to keep accessible information on their purchasing including utilities and waste production. This would not only allow for a better picture to be gained of resource management in the sector as a whole but would also facilitate better resource management in individual establishments.



appendix 1 – resource flows per sector

average annual resource use per student in primary schools surveyed

resource		average inputs	average in use	average outputs
water		6.56m ³	n/a	6.65m ³
energy	electricity	330kWh	n/a	142.03kg CO ₂
	gas	633kWh	n/a	120.22kg CO ₂
	renewable	n/a	n/a	n/a
products	paper	13.7kg	n/a	15.7kg
	recycled paper	0.01kg	n/a	n/a
	computers	n/a	5.72kg	1.59kg
	printers	0.53kg	1.17kg	0.37kg
	toner cartridges	0.02kg	0.01kg	n/a
	remanufactured cartridges	n/a	n/a	n/a
	desks	4.03	8.32kg	1.04kg
	chairs	0.81	8.26kg	0.74kg
waste	general	n/a	n/a	26.5kg

average annual resource use per student in secondary schools surveyed

resource		inputs	in use	outputs
water		11m ³	n/a	10.90m ³
energy	electricity	488kWh	n/a	209.86kg CO ₂
	gas	1593.04	n/a	302.68kg CO ₂
	renewable	n/a	n/a	n/a
products	paper	13.80kg	n/a	8.40kg
	recycled paper	0.21kg		0.00kg
	computers	2.46kg	9.10kg	3.77kg
	printers	0.17kg	0.64kg	0.62kg
	toner cartridges	0.02kg	0.00kg	0.00kg
	remanufactured cartridges	0.00kg	0.00kg	0.00kg
	desks	0.80kg	12.87kg	0.60kg
	chairs	5.51kg	7.19kg	0.56kg
waste	general	n/a	n/a	15.95kg

average annual resource use per student in FHEIs surveyed

resource		inputs	in use	outputs
water		11.45m ³	n/a	11.11m ³
energy	electricity	423.64kWh	n/a	0.18kg CO ₂
	gas	1816.65kWh	n/a	0.34kg CO ₂
	renewable	106.05kWh	n/a	–
products	paper	8.63kg	n/a	56kg
	recycled paper	0.16kg	n/a	–
	computers	0.44kg	438.86kg	–
	printers	0.13kg	130.52kg	–
	toner cartridges	0.02kg	21.36kg	–
	remanufactured cartridges	0.02kg	17.85kg	–
	desks	0.06kg	–	–
	chairs	0.04kg	–	–
waste	general	n/a	n/a	99.5kg

appendix 2 – general waste calculation

The factor used to convert volume of general waste to weight across all establishments was an industry standard of 40 kg/m³.

Volume to weight conversion factors for other materials were based on those published by the then Department for Environment Transport and Regions (DETR) now Defra.

Commonly used factors included

- paper/card: 0.6 kg
- glass: 0.75 kg
- construction: 1.2 kg



appendix 3 – glossary of acronyms

BESA	British Educational Suppliers Association
BREEAM	Building Research Establishment Environmental Assessment Method
CCL	climate change levy
CEE	Council for Environmental Education
CEU	carbon equivalence unit
COPERNICUS	Cooperation Programme in Europe for Research on Nature and Industry through Coordinated University Studies
Defra	Department for Environment, Food and Rural Affairs
DfES	Department for Education and Skills
DoH	Department of Health
EAU	European Association of Universities
EAUC	Environmental Association of Universities and Colleges
EMS	environmental management system
EU	European Union
FE	further education
FHEI	further and higher education institution
GAP	Global Action Plan
GHESP	Global Higher Education for Sustainability Partnership
HE	higher education
HEeP	higher education e-procurement
HEEPI	Higher Education – Environmental Performance Improvement
HEPPI	Higher Education Pay and Prices Index
HEPS	Higher Education Partnership for Sustainability

HTI	Heads, Teachers and Industry
IAU	International Association of Universities
kWh	kilowatt hour
NVQ	National Vocational Qualification
RSNC	Royal Society for Nature Conservation (now called the Royal Society for Wildlife trusts (RSWT))
SCOP	Standing Conference of Principals
SEAM	Schools Environmental Assessment Method
SUPC	Southern Universities Purchasing Consortium
SWAC	Schools Waste Action Club
ULSF	University Leaders for a Sustainable Future
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WESP	Waste Education Support Programme
WWF	World Wildlife Fund

waste stream analysis

Waste stream analysis involves analysing the different types of waste produced by an organisation.

government maintained schools

Government maintained (or state) schools represent the largest single aspect of school education in the UK. Government maintained schools are funded by local or central government. There are a variety of government maintained schools in the UK which all fall under either the primary or secondary education umbrellas.

independent schools

Independent schools coexist alongside those that are government maintained. These schools are independent of local or central government control. They are sometimes called fee-paying schools because they charge parents fees. They are also called private schools, but most schools in the independent sector are not privately owned in reality⁵⁰.

triple bottom line

The triple bottom line encourages organisations to focus not just on the economic value but also on the environmental and social value of its activities.

⁵⁰ www.iscis.uk.net

The term is used to capture the whole set of values, issues and processes that companies must address in order to minimise any harm resulting

from their activities and to create economic, social and environmental value.

appendix 4 – example of an audit report for a primary school

1 introduction

Thank you for participating in the education mass balance project. It is an important project because the environmental footprint of the whole education sector has never been fully examined and due to the size and resource use of the sector it is felt to be potentially significant. If properly researched, actions can then be implemented to substantially reduce its environmental impact. In addition, it is widely recognised that schools have a vital role to play in indoctrinating sustainable practices in children. Students can make a huge difference to sustainable development and it is hoped that through this work the message will be passed on in the home and will help to improve awareness of environmental issues.

Education for sustainable development is also a growing field and this work will be valuable in promoting sustainable development in schools. In 2003 the government's Action Plan for Sustainable Development in Education and Skills was published which outlines a number of objectives and actions to help the education sector operate in a more environmentally sustainable way. By taking part in this study, your establishment has helped promote the action plan objectives, which include

- the promotion of sustainable development through extensive communication and specific initiatives
- raise awareness of good practice in travel and energy efficiency policies
- integrate sustainable procurement within educational establishments (DfES, 2003)

1.1 project aims

The aims of the education mass balance project are to

- identify the resource consumption, use and disposal of the education sector
- increase awareness of resource management issues in the education sector
- improve the sector's environmental performance
- promote cultural change through the increased awareness of staff, students and subsequently parents

This report shows your school's current activities in relation to environmental performance and outlines guidance of ways in which more sustainable practices can be introduced.

2. audit findings

Following the audit conducted with school 1⁵¹, from the information supplied by pupils and staff we have drawn together the main findings and identified the establishment's main environmental impacts. From this we have developed key recommendations to allow you to increase resource efficiency, reduce costs and move forward towards a more sustainable future (section 3). The audit is split into the following areas: initiatives, awareness & communication; purchasing; paper use; catering; cleaning; energy; water; waste & recycling.

2.1 initiatives, awareness & communication

Communication and awareness of environmental issues are vital for the success of any environmental initiative and so that both pupils and

⁵¹ to protect the identity of the school it is referred to as 'school 1'



staff gain ownership and understanding of their role. Effective communication ensures greater awareness and is easily achievable within the school environment where communication channels are already strong.

findings

School 1 has not signed up to any of the following national or local environmental initiatives. However, it is a ‘healthy school’ which does cover some areas applicable to environmental issues, such as a green travel plan.

national	local
Greening Britain’s Schools <input type="checkbox"/>	Schools Waste Action Club <input type="checkbox"/>
Eco Schools <input type="checkbox"/>	Waste Watch’s Cyclor <input type="checkbox"/>
Safer Routes to School <input type="checkbox"/>	Western Riverside Education Programme <input type="checkbox"/>
Energy Certification for Schools <input type="checkbox"/>	Other: <input type="checkbox"/>
Think Sustainability <input type="checkbox"/>	

To establish the level of knowledge about the establishment’s environmental footprint a senior member of staff was asked to list what they perceived to be the major environmental impacts of the establishment. These were

- 1 paper use and wastage
- 2 heating
- 3 lighting

The audit also found the following about environmental awareness and communication at the school

- environmental issues are taught in science and PHSE
- there is no environmental/eco club but there is a school council which could be used as a forum to discuss environmental issues at the school
- in addition to curricular teaching, environmental awareness work has been done with the pupils
- transport – there is no car share or walking bus scheme. However, every year there is a ‘walk to

school’ week in which many children do take part

2.2 purchasing

Procurement and the supply chain are an important part of any organisation’s activities and can have a significant impact on the environment. Choosing the right products or suppliers at the outset can reduce an organisation’s environmental footprint significantly. The types of products that schools purchase are highly variable in quality and in their environmental and sustainability credentials. Paper is a particularly important product due to the sheer quantities purchased.

findings

- within the education sector procurement is primarily driven by best value. Cost and a lack of awareness about environmental alternatives were identified during the audit as being barriers to sustainable procurement
- at present, there are no environmentally friendly

or recycled products routinely purchased, although some recycled paper products are occasionally bought

- the A4 paper currently purchased is derived from sustainable forests

2.3 paper use

Paper use is one of the main impacts of an educational establishment. The way we use paper is very important and there are a number of things you can do in the office and classroom to minimise paper use. This will have the dual benefit of reducing the costs of paper purchasing and reducing disposal costs, considering that paper can make up 60% of the waste produced in schools. If your school is operating a paper recycling scheme then to 'close the loop' and fully recycle, recycled paper should be purchased as well.

findings

Paper use and wastage has already been identified by staff as being one of the main environmental impacts at the school. To try to address this, scrap pads are made from unwanted paper.

2.4 catering

Catering is a major part of the school's daily activities and therefore has a significant impact on the environment due to quantities of food purchased, deliveries and waste production. A number of steps can be taken to reduce this impact.

findings

- compared to some schools, the catering department has less of an environmental impact
- disposable catering items are not used and the use of cooking oil is avoided
- as they are a 'healthy school', fruit is encouraged as a snack, rather than so-called junk food items
- all deliveries are made in cardboard boxes which are disposed of in general waste

- the school reuses its cutlery and lunch trays
- there are no plastic cups used

2.5 cleaning

Cleaning has environmental impacts through the use of chemicals and cleaning products. In addition, the cleaning department can have an impact on any environmental activities through staff involvement in initiatives. This can sometimes be impeded if cleaning is provided by an external company.

findings

- as expected the school uses a wide range of cleaning chemicals
- all cleaning is done in-house and no external company is used
- the cleaning staff do not have any involvement in the paper recycling
- cleaning products are not diluted and are used neat

2.6 energy

Energy costs are often seen as a fixed overhead by many organisations. However, reducing energy consumption also makes good business sense because it

- saves money
- improves your reputation
- contributes to government targets to reduce atmospheric emissions
- helps the environment by reducing CO₂ production from the burning of fossil fuels

The government's Action Energy programme estimates that most organisations can reduce their energy consumption by 23% a year. This can equate to a saving of as much as £17.85 per pupil per year (Think Leadership data).

Education buildings are responsible for more than 5% of CO₂ emissions from non-domestic buildings (DfES, 2003) and the sector spends £350 million

per annum on energy. Improving energy efficiency in schools can reduce energy bills and improve a school's environmental performance. Section 4 contains a list of contacts that are able to give advice about energy matters.

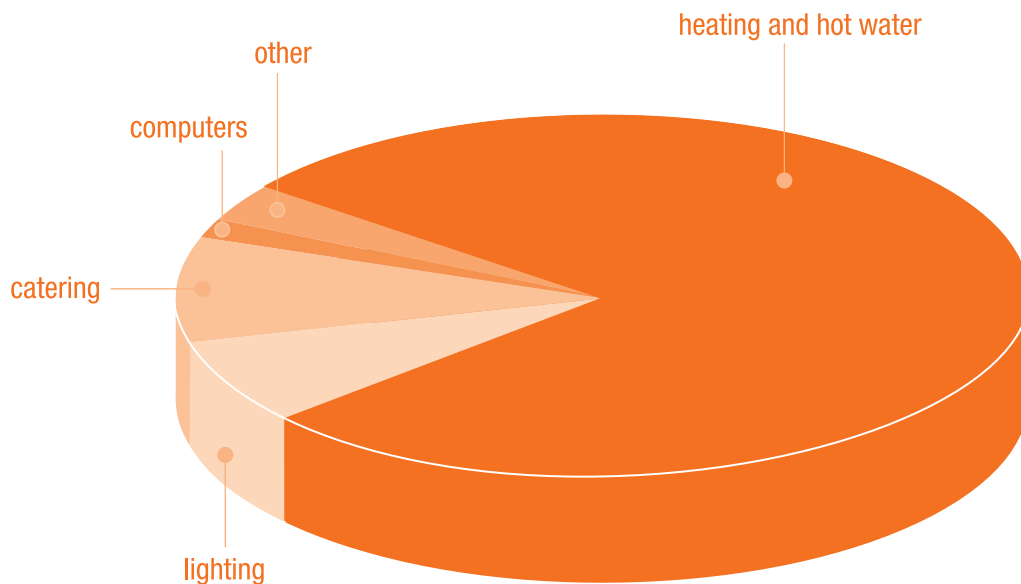
findings

Table 1 shows the energy consumption for school 1 during 2003 and the associated CO₂ production during this time. Energy consumption is associated with CO₂ and for every kWh of electricity consumed 0.43kg of CO₂ is produced and 0.194kg per kWh for natural gas. Figure 1 shows the breakdown of CO₂ emissions in the average school.

table 1 energy consumption at the school during 2003

energy type	amount consumed 2003 (kWh)	associated CO ₂ production (tonnes)
gas	449,291	87
electricity	73,627	31
total	522,918	118

figure 1 tonnes of CO₂ produced based on average school energy consumption



(energy consumption figures taken from BRE and DFES data 2002)

- the amount of CO₂ produced at the school is equivalent to the weight of nearly 24 adult male elephants!
- lighting plays a significant part in the consumption patterns and it was noticed during the audit that lights were often left on in unused rooms
- computers and monitors are not switched off when not in use during meetings and lunch breaks
- individual radiators were used to heat the building and there is one thermostat for the whole school
- energy usage is monitored via meter readings. Regular assessment of energy consumption will allow the school to identify any major increases or decreases in consumption levels
- as the school building is relatively new, all the light fittings are of the more energy efficient variety

2.7 water

Water consumption is not always considered as an important environmental impact. However, it can represent a considerable cost to an organisation and, as a resource that is not in limitless supply, it is important to conserve water.

Schools spend a total of around £70 million a year on water, an average of over £2,500 per school. It has been shown that careful water management, coupled with an effective education programme, can significantly reduce water use from 12 cubic metres (12 tonnes!) per pupil per year to 4 cubic metres a year. This could save a school of 600 pupils around £5,000 every year (DfES, 2003).

findings

- in 2003 the school used approximately 966m³ of water at a cost of around £2011 (including sewerage charge). The majority of this water consumption will have been from the kitchens and toilet facilities
- there are no water saving devices in the toilet cisterns

- there are no urinals at the school
- there are some push taps, but not all taps are

2.8 waste & recycling

Waste production is one of the largest environmental impacts in most schools as most waste is sent to landfill sites rather than reused or recycled. The impacts of this are two-fold as this represents an enormous waste of energy and resources that could easily be avoided and landfill space is rapidly running out in the UK.

Waste management is an area of internal environmental management where through simple measures significant cost savings can be gained. According to Envirowise, when taking into consideration the wasted cost of unused raw materials, packaging, repair and disposal costs, waste accounts for as much as 4% of an organisation's turnover. A good waste minimisation plan can save as much as 1% of turnover by ensuring packaging is minimised and/or recycled and waste is minimised. Waste management should follow the waste hierarchy and reducing consumption should be the first stage in any plan, rather than recycling. Figure 2 identifies the different stages of the hierarchy.

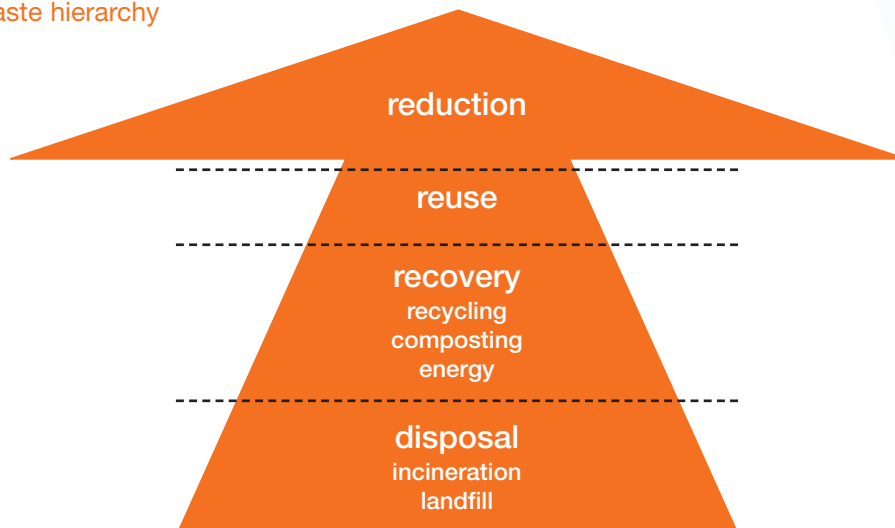
findings

- it is estimated that school 1 produces approximately 90 tonnes of waste every year that is sent to landfill. This is equivalent to the weight of 18 adult male elephants
- school 1 has a paper recycling scheme in place. There is one bin for the whole school
- once the garden area has been completed, they are keen to start composting their organic waste

As already identified, waste production is one of the main environmental impacts in a school. Table 2 and figure 3 shows the percentage of waste according to category in the average school. The list is not exhaustive and if the school already has some initiatives in place, the percentage for some categories, especially paper, will be reduced.

However, experience has shown that even with the best will in the world, recycling facilities are not always fully utilised.

figure 2 the waste hierarchy

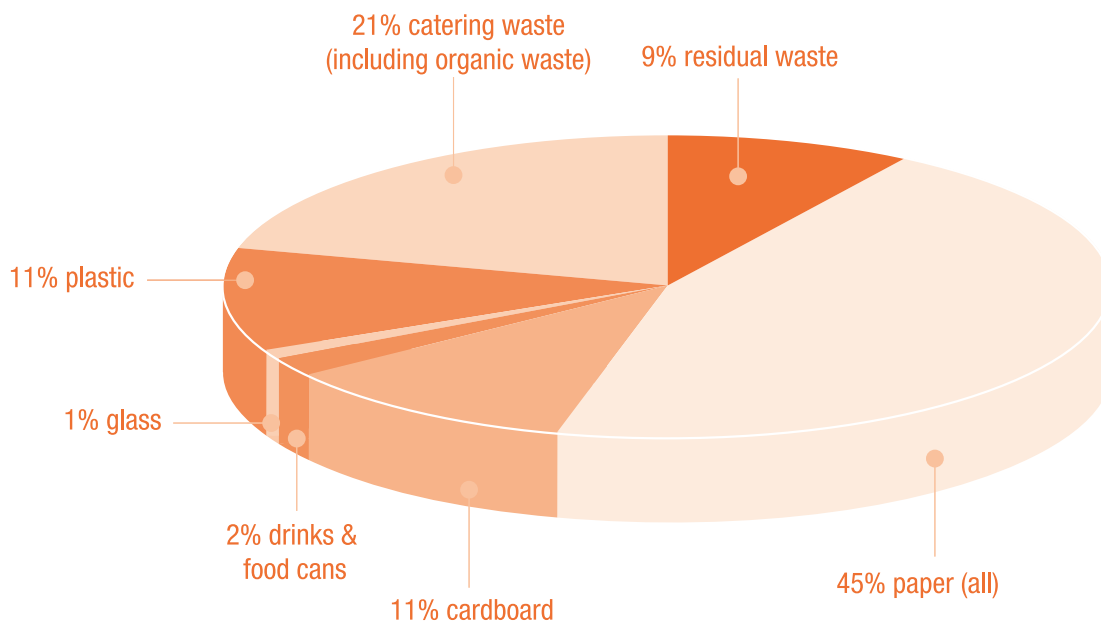


source Wastebusters Ltd (1996) Green Office Manual

table 2 landfilled waste according to category

waste type	% waste in average school	recyclable
residual waste	8.5	no
paper (all)	45.3	yes
cardboard	11.3	yes
drinks & food cans	2.0	yes
glass	0.5	yes
plastic	10.5	partly
catering waste (including organic waste)	21.1	partly – organic waste is compostable

figure 3 percentage waste in an average school (Waste Watch data)



As is clear from the above facts and figures, there is still room for improvement in most schools, particularly in reducing general waste and ensuring recyclable waste is recycled. The recommendations in section 3 identify actions that can be taken to minimise waste.

3 audit recommendations

3.1 initiatives, awareness & communication – recommendations

There are a number of simple measures that can be taken within the establishment to raise awareness across the board

- consider creating an official environmental policy for the school. Other policies are already in place so it may be easy to add environmental issues. This should cover areas such as resource use, procurement, waste and recycling, energy, and waste. If possible, the policy should set targets for environmental improvement and outline ways in which environmental performance can be monitored against these targets
- consider enhancing the school’s reputation by

joining an environmental initiative (examples are listed section 2.1). These schemes provide useful information about environmental improvement. Raise prominent issues during assembly and staff meetings

- set up a specific environmental notice board that pupils and teachers see regularly to promote actions and draw attention to relevant issues. Notice boards are an effective way of communicating environmental initiatives. They should be updated regularly and have varied themes and display achievements
- run school-wide environmental campaigns, such as an energy-saving ‘switch off’ campaign. Engage pupils by getting them to design stickers and posters. The creation of an identity for an environmental programme such as a cartoon character see figure 4 for an example) or a coloured logo can be a useful way of promoting involvement and enthusiasm
- set up an environmental club and/or engage the student council in making decisions on environmental improvements. Students and staff members must feel they have ownership of any

new environmental initiatives. If they feel they have been properly consulted and listened to they are more likely to embrace change

- students can be easily involved through year or form league tables for improved environmental performance. Planning should also take into account incentives to maintain the momentum of the scheme
- where possible work environmental issues deeper into the curriculum. This will make communication and awareness initiatives easier if there are links to the national curriculum. In section 4 of this report, there is a list of useful contacts and organisations that can provide information, guidelines and resources as to how to integrate environmental issues into the national curriculum. Many of these also offer free teaching packs
- communicate your school's stance on the environment externally to parents and the wider community. This can be done through

newsletters, website and/or producing a simple display area for your reception. Often the best way to disseminate your environmental policy and performance is to use existing communication routes rather than inventing new ones. If the school is running a large campaign, try to get the local newspaper to run an article on the initiative to really raise the school's profile

- transport – in urban areas in term time the school run accounts for nearly one in five cars on the road at 8.50am (DfES, 2003)! The government has recently published Travelling to school: An Action Plan and a capital grant is available to schools who have completed travel plans. For more information visit the teachernet website (see section 4). Also consider whether it would be possible to circulate parents' contact details (with their consent) so that pupils who live near each other can share lifts to and from school if necessary

figure 4 create an identity for any environmental initiatives (cartoon from www.recyclesomerset.info)



3.2 purchasing – recommendations

- identify product lines in which environmentally-friendly, cost-effective products are available, such as recycled paper or cleaning chemicals (see contacts in section 4 and information is also easily available on the internet)
- it is a common misconception that recycled paper is inferior and cannot be used in certain printers. Many recycled papers are now at least as good as virgin brands. If the organisation does not wish to buy recycled paper, a Forest Stewardship Council (FSC) certified paper is the

next best alternative. Figure 5 shows some of the symbols that represent the different environmental categories of paper

- consider the whole life cost of a product and also assess which products represent better value in the longer term eg energy efficient products may be more expensive at the outset but cost savings are soon realised over the product's life span
- when researching the possibility of buying recycled products, ask suppliers for quotes for recycled and virgin products. If suppliers are

asked to give comparisons they have to be more careful as they will be keen to keep your business and will not want to price themselves out of the market. Consequently you may be able to negotiate a lower price. Consumables can be trialled before moving forward into a more comprehensive green procurement policy.

paper symbols

Currently, a number of labelling schemes exist to inform consumers of the composition of recycled paper and the source of the recycled content.



The Blue Angel is Europe's tightest specification for recycled paper and means the paper was made from 100% scrap paper. This symbol covers not only papers, but a wide range of products.

The **NAPM** recycled mark is awarded to paper which contains a minimum of 75% genuine recycled paper.

Mobius Loop if there is a percentage in the centre this indicates how much recycled fibre was used. If the centre is blank this means the product is recyclable, **not** that it was made from recycled materials

FSC paper comes from sustainably managed forests

The following symbols are also shown which do not necessarily mean that the paper has a recycled sustainable managed content



Many 'green' symbols such as the EU ecolabel and Nordic Swan often only indicate 'environmental friendliness', and may not necessarily mean that the product contains recycled material. Other accreditation such as ISO 14001 indicated that the production process conforms to strict parameters set by ISO.



Other symbols like the German green dot have no environmental significance, meaning only that the manufacturer has paid a fee towards the packaging recovery system in Germany.

3.3 paper use – recommendations

Reducing the need to use paper at all should be the first priority and can significantly reduce purchasing and disposal costs. This can be done by

- doublesided printing: paper is a valuable resource and should be viewed as a two-sided product. Staff should be encouraged to print double sided wherever possible. This can easily be achieved through a poster campaign near printing facilities. Most modern printers and photocopiers will be fitted with a duplex facility for doublesided printing. If appropriate this can be set to be the default setting, staff are then forced to consciously change the setting back to single-sided if required rather than the other way around
- making use of unwanted one sided print outs for draft printing within the school office
- communicate to pupils the value in reusing paper and not wasting it

- improving use of electronic systems for archiving and storage

3.4 catering – recommendations

- fresh food should be bought in regularly during the week. Minimal frozen and packaged food should be purchased and used
- fruit and vegetable peelings could be composted on site and this is something that is already being considered by the school
- for those children who bring packed lunches, try to educate them about the possibility of having as ‘waste-free’ a packed lunch as possible. If possible, a school project could be run in this area as part of the healthy schools initiative
- where cardboard boxes are used for deliveries enter into dialogue with the supplier to find out whether it is possible to receive goods in returnable crates. If cardboard boxes have to be used then make sure all boxes are flat-packed prior to disposal

3.5 cleaning – recommendations

- engage your external contractors at all times to ensure that there is effective communication. Make them aware of what you are trying to do and why school and how they can take part
- involve cleaning staff in environmental initiatives and ask them to help with recycling. This also means they can be involved in monitoring the system and could ensure recyclables are not being disposed of in the normal waste bins
- ensure staff receive feedback about the most efficient use of cleaning chemicals
- investigate environmentally friendly cleaning detergents and look at the possibility of trialling their use, involving cleaning staff at all stages
- spray bottle chemicals are bought in spray containers as a one off purchase. The cleaning product can then be bought in large commercial containers and decanted into the reused spray bottles

3.6 energy – recommendations

- encourage people to switch off. Run a ‘switch off’ campaign involving pupils and staff using notice boards, switch off posters and stickers. Motivate your pupils and staff by providing regular feedback, running competitions and rewarding good performers. Savings of around 15% are possible from switching off unnecessary lights. Appoint children as light monitors to switch off lights in unoccupied areas. Ask cleaning staff to switch off lights as they move from room to room
- add a reminder message about energy saving to log on screens for networked PCs. Computer monitors use two thirds of a computer’s energy! A PC left permanently switched on can cost a school £60 per year. This figure can be reduced to well over half if the monitor is turned off when not in use and the PC is switched off overnight (HTI data)
- consider implementing an energy policy (if not covered by an environmental policy). The Energy Certification for Schools scheme offers advice on how to create such a policy
- consider changing electricity suppliers to a renewable source. This will help reduce electricity bills as there is no climate change levy charge associated with renewable energy supplies
- monitor energy consumption by doing spot checks or checking offices at end of day to see what equipment has been left on. Take weekly/monthly meter readings and cross check with bills. Set targets for energy savings and monitor progress against them
- contact your energy manager. Leeds City Council has an energy manager who can advise on efficient use of energy in local authority buildings, including schools
- make sure all hot water and heating pipes are lagged
- check thermostats are set correctly. Incorrect thermostat settings can have a significant effect on consumption. Reducing the temperature by

just 1°C can reduce overall heating costs by up to 10%. Fitting thermostatic valves on radiators can help to control temperatures and are a relatively low cost option. Classroom heating should be set to 18°C. According to the DfES, heating contributes to 78% of all CO₂ emissions in schools

- ensure light fittings are cleaned once a year. Dirty diffusers or shades can reduce light output, meaning more lights need to be on

3.7 water – recommendations

- carry out a water audit, identifying taps that can be changed to push taps, toilet cisterns that could be replaced with reduced flush cisterns and monitoring water consumption out of hours. Yorkshire Water should be able to offer you a free water audit. They also have guidance on how to integrate water conservation into the national curriculum on their website and offer free education packs
 - put water hogs/hippos in toilets to reduce water use (available from Yorkshire Water) which can save 1 litre of water with each flush
 - underground leaking pipes can mean a huge loss of water, which will cost your school money. Ask your water company about their free leak detection service. By monitoring water consumption it is possible to identify leaks before they become problematic
 - consider purchasing water butts to collect rainwater from downpipes such as building guttering. In any one year, 3.6 million litres of rain falls on to a typical primary school roof (4,000 square metres) (DfES, 2003)
 - communicate success of water saving measures to staff and pupils and show how much water has been saved using examples that children can visualise eg in terms of a swimming pool
- authority/waste contractor such as for cardboard. It was mentioned during the audit that the school would consider cardboard recycling. The possibility of composting to minimise waste has already been discussed
 - last year, 350 million ink cartridges were landfilled which could have been reused. Inkcycle collect ink cartridges and pay £5 for each cartridge sent to them (details in section 4). Try starting a collection scheme to encourage staff and pupils to bring used cartridges from home
 - instead of disposing of it, donate unwanted IT equipment and furniture to local organisations in your area that will be able to make use of them. Tools for Schools is able to receive unwanted IT equipment and donate reconditioned computers to school. The Furniture Re-use Network and your local council will be able to advise you on groups in your area which accept unwanted furniture
 - make sure all special waste, including old fridges and fluorescent light tubes are disposed of correctly. Contact your local authority for further information
 - implement the waste hierarchy by focusing more on waste minimisation, particularly with regard to paper
 - procedures for recycling need to be formalised and communicated so everyone knows what is expected of them and how to dispose of things correctly
 - remind people to use the existing paper recycling bins
 - communicate the success of any recycling or waste minimisation initiatives eg if there has been a reduction in the number of general waste bins at the school as a result of recycling

3.8 waste & recycling – recommendations

- investigate the possibility of installing further recycling facilities from your local

appendix 5 – contacts and further information

general useful contacts

Council for Environmental Education

94 London Street
Reading RG1 4SJ
0118 950 2550
info@cee.org.uk
www.cee.org.uk

Higher Education Funding Council for England

Northavon House
Coldharbour Lane
Bristol BS16 1QD
0117 931 7317
hefce@hefce.ac.uk
www.hefce.ac.uk

environmental initiatives and schemes schools

Eco-Schools

Elizabeth House
The Pier
Wigan WN3 4EX
01942 824620
eco-schools@encams.org
www.eco-schools.org.uk

Global Action Plan

8 Fulwood Place
London WC1V 6HG
020 7405 5633
www.globalactionplan.org.uk

Think Leadership Programme

HTI Leadership Centre
Herald Court
University of Warwick Science Park
Coventry CV4 7EZ
www.thinkleadership.org.uk

universities

Environmental Association of Universities and Colleges

Bank House Farm
Stanford Bridge

Worcestershire WR6 6R

info@eauc.org.uk
www.eauc.org.uk

Higher Education Environmental Performance Improvement

HEEPI, Department of Environmental Science
University of Bradford
West Yorkshire BD7 1DB
01274 235396
a.vanwinsum@bradford.ac.uk
www.heepi.org.uk

Higher Education Partnership for Sustainability

Education and Learning Programme
Forum for the Future
227a City Road
London EC1V 1JT
020 7477 7702
www.forumforthefuture.org.uk/aboutus/HEPS_page1509.aspx

travel

Safer Routes to School

0117 915 0100
schools@sustrans.org.uk
www.saferoutestoschools.org.uk

School Travel Plans

Liftshare.com
Butterfly Hall
Attleborough
Norfolk NR17 1AB
07944 401111
www.schooltravelplan.org

catering

Aramark Ltd

1 Coombe Square
Thatcham
Berkshire RG19 4JF
0165 586 0880
education@aramark.co.uk
www.aramark.co.uk

Local Food Works

Soil Association
Bristol House
40 – 56 Victoria Street
Bristol BS1 6BY
0117 914 2424
www.localfoodworks.org

National School Fruit Scheme

Department of Health
PO Box 777
London SE1 6XH
0800 555 777
schoolfruit@doh.gsi.gov.uk
www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/FiveADay/FiveADayGeneralInformation/fs/en

Sustain

94 White Lion Street
London N1 9PF
020 7837 1228
www.sustainweb.org

energy

The Carbon Trust (schools and universities)
0800 58 57 94
www.thecarbontrust.co.uk

Centre in Research, Education and Training

Kenley House
25 Bridgeman Terrace
Wigan WN1 1TD
01942 322271
info@create.org.uk
www.create.org.uk

Energy Certification for Schools

0870 1 282820
www.est.org.uk/schools

furniture**British Furniture Manufacturers**

30 Hardcourt Street
London W1H 2AA
020 77240851
www.bfm.org.uk

Furniture Re-use Network

48-54 West Street
St Philips
Bristol BS2 0BL
0117 954 3571
www.frn.org.uk

IT equipment

Inkcycle (also cartridge recycling)
Drinsey Nook
Gainsborough Road
Lincoln LN1 2BR
0800 652 7085
www.inkcycle.co.uk

Toner Flow

Montrose House
412-416 East Avenue
Ilford
Essex IG2 6NQ
0870 443 5353
sales@tonerflow.co.uk
www.tonerflow.co.uk

Tools for Schools

12-14 Berry Street
London EC1V 0AQ
020 7689 1990

**waste and recycling
general information****Lets Recycle**

154 Buckingham Palace Road
London SW1W 9TR
www.letsrecycle.com

Recycle More

Valpak Ltd
Stratford Business Park
Banbury Road
Stratford-Upon-Avon CV37 7GW
08450 682 572
recycle-more@valpak.co.uk
www.recycle-more.co.uk

Recycle Now

0845 331 3131
www.recyclenow.com

Recyclezone

www.recyclezone.org.uk

Waste Watch

56-64 Leonard Street
London EC2A 4JX
020 7549 0300
info@wastewatch.org.uk
www.wastewatch.org.uk

Waste Watch Wasteline

0870 243 0136
www.wasteonline.org.uk

materials recycling

Alupro (metal recycling information)

1 Brockhill Court
Brockhill Lane
Redditch B97 6RB
01527 597 757
info@alupro.org
www.alupro.org.uk

Recoup (plastics information)

9 Metro Centre
Welbeck Way
Woodston
Peterborough PE2 7WH
01733 390231
enquiry@recoup.org
www.recoup.org

The Composting Association

Avon House
Tithe Barn Road
Wellingborough
Northamptonshire NN8 1DH
01933 227 777
www.compost.org.uk

sustainable procurement links

- **Higher Education E-Procurement (HEeP)** – is an e-procurement marketplace solution for the UK higher education sector and its suppliers. The initiative is a collaborative development involving a number of universities and drawing on support from regional purchasing consortia and the Joint Procurement Policy and Strategy Group (JPPSG)
- **The Canny Buyer** – is funded by a Scottish Executive Sustainable Action grant and run under auspices of Aberdeen City Council. The initiative will take forward sustainable procurement in Scotland in both the private and the public sector
- **Sustainable Development in Government Part F Procurement** lists UK government policies, guidance documents and product specific information
- **Procureweb** is a procurement support service, for the UK FHE sector and research councils. It provides tools, information and support to anyone who participates in the procurement process. Procureweb also facilitates regional consortia, as below

HEPCW Higher Education Purchasing Consortium, Wales
JCACP Joint Consultative and Advisory Committee on Purchasing (Scotland and Northern Ireland)

LUPC London Universities Purchasing Consortium

MUPC Midlands Universities Purchasing Consortium

NEUPG North Eastern Universities Purchasing Group

NWUPC North Western Universities Purchasing Consortium

UPC Southern Universities Purchasing Consortium

- the **Association of University Purchasing Officers (AUPO)** aims to promote and implement best purchasing practice and

facilitate networking of purchasing expertise amongst membership nationally

- **International Purchasing and Supply Education and Research Association** is an active network of academics and practitioners dedicated to the development of understanding on matters concerning the future of purchasing

and supply management

- **HEPS Purchasing for Sustainability** is a guide produced under the HEPS programme focusing on helping institutions to understand what sustainable purchasing is and how it could be implemented in their own organisations

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