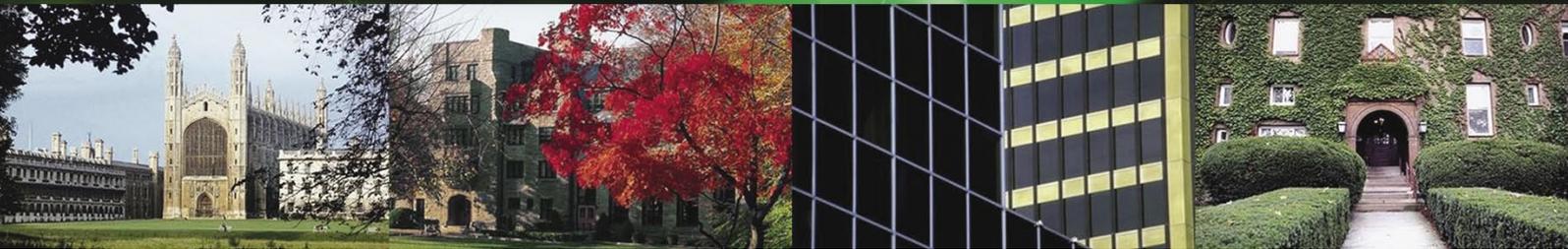


THE  
**GREEN GOWN**  
*Awards*  
2004

transport  
technology  
**sustainable**  
environmental  
energy efficiency  
education



Recognising Progress Towards More Sustainable  
Further and Higher Education in the UK

*In association with:*



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# Foreword



*H Newby*

Chief Executive  
Higher Education Funding  
Council for England

Universities and colleges already contribute in many ways to sustainable development, but there is potential for us to do more. I believe we all, as individuals, have a responsibility to help protect the future of the societies we serve, but equally I recognise that implementing this can be problematic. Decisions have costs and benefits, and we have a responsibility to maintain high standards and to ensure a diversity of educational options.

HEFCE's consultation paper on sustainable development in higher education seeks to stimulate the debate about how we can increase our contribution to sustainability. And I am delighted to endorse these awards because they show just how much is achievable in our professional capacity, and at what cost and benefit.

The Green Gown Awards focus on one aspect of the sustainability agenda – the protection of natural resources. Greater understanding of the practical application of these issues is critical: our stakeholders are already demanding that we take more action in this area, and this is backed up by increased regulation. Making universities and colleges more sustainable can also make business sense, by protecting and enhancing our reputation, connecting us with the concerns of our future markets – tomorrow's societies and students – and, sometimes, by improving our operational efficiency. These factors are persuading many leading universities and colleges in other countries to increase the scale of their commitment. It is vital that the UK is not left behind.

Improving energy and water efficiency can result in considerable financial and non-financial benefits, as the entries from the University of Glasgow and the University of Sheffield demonstrate. This is even more likely to be true in an era of rising energy costs. Leeds Metropolitan University also shows that minimising waste and highlighting environmental issues in procurement can provide both financial and non-financial benefits.

However, environmental improvement is not just about, and will not always create, immediate financial reward. Reducing the transport impacts of our activities will not be profitable for the foreseeable future, but is important because it reduces carbon dioxide emissions. Furthermore, encouraging staff and students to use their cars less can enhance community relations and student lifestyles, as the University of Southampton has demonstrated.

In the medium to long term, perhaps the most tangible manifestation of an institution's commitment to environmental improvement is the quality of its buildings. The efforts made by the Universities of Newcastle and Hertfordshire indicate that functionality, good design and good environmental performance can be compatible. Higher education is one of the few sectors that can have confidence that it will still be using buildings commissioned today in 30-40 years' time. It therefore has a special obligation to take account of long-term issues such as rising energy prices and carbon management during their design and construction.

# Introduction

The Green Gown Awards were established to raise awareness of the growing pressures for better environmental performance by UK universities and colleges, and to recognise positive responses to them. They have been sponsored by the Association of University Directors of Estates, British Universities Finance Directors Group (BUFDG), Carbon Trust, Energy Consortium, Environmental Association for Universities and Colleges (EAUC), Standing Conference of Principals (SCOP) and the Times Higher Education Supplement. Individual categories were also sponsored by the Association for Commuter Transport, BRE, Energy Consortium, Proc-HE and WARMNET.

## The Judging Panel

This was only finalised after entries were received to avoid conflicts of interest. The judging criteria were originality; potential replicability; scale of benefits, and cost-benefit ratio; and the quality of evidence provided. The panel comprised:

Margaret Bates, University of Northampton (representing WARMNET)

Simon Britton, University of Leicester (representing AUDE)

Simon Chiva, UK Centre for Economic and Environmental Development

Christopher Crookall-Fallon, ESD

Nick Cox, Earthcare

Tom Farnsworth, Association for Commuter Transport

James Fisher, BRE

Mark Gibson, Chartered Institution of Waste Management

Paul Goffin, University of Leicester (representing AUDE)

Peter Hayward, Consultant (representing EAUC)

Philip Harding, University of Westminster (representing BUFDG)

Andrew Johnston, Forum for the Future

Stephen Mahon, Centre for Sustainable Engineering

David Morton, NIFES

Nick Rijke, Environment Agency

Paul Russyvelt, ESD

David Thomas, The Energy Consortium

Andrew Thorne, BRE

Allan Waller, SULO

Jim Whelan, GVA Grimley

Alan Yates, BRE

# An International Example

Environmental concern remains high in many American states, communities and individuals – and is stimulating very proactive responses by universities, including Harvard. The University (whose schools have responsibility for Estates) established a central Harvard Green Campus initiative in 2000, supported by a \$3 million interest free loan facility to finance environmental improvement, and a commitment of \$150,000 a year for five years to fund core staff. This has resulted in:

- Loans to over 40 energy and water efficiency projects which, on average, have generated enough financial savings to repay the principal in just three years
- Conversion of Harvard's entire fleet of diesel vehicles, including student shuttle buses, to bio-diesel, a cleaner-burning fuel made from soybean oil
- Achieved or pending Leadership in Energy and Environmental Design (LEED – the US equivalent of the UK's BREEAM scheme) certification of eight new buildings and building renovations
- Reduced energy consumption of 10-12%, and increases of over 50% in recycling rates, in undergraduate student residences.

Two new dedicated funds have also been established – one to provide loans to finance any additional capital expenditure to achieve high environmental performance in new construction and renovations, the other to support research into medium-long term renewable energy options for the University.

The Initiative has also worked with students, faculty, and administrators to define the following Sustainability Principles:

- Demonstrating institutional practices that promote sustainability, including measures to increase efficiency and use of renewable resources and to decrease production of waste and hazardous materials, both in Harvard's own operations and those of its suppliers
- Promoting the health, productivity, and safety of the University community through design and maintenance of the built environment
- Enhancing the health of campus ecosystems and increasing the diversity of native species
- Developing planning tools to enable comparative analysis of sustainability implications and to support long-term economic, environmental, and socially responsible decision-making
- Encouraging environmental inquiry and institutional learning throughout the University community
- Establishing indicators for sustainability that will enable monitoring, reporting, and continuous improvement.

The Principles were adopted by Harvard in October 2004, when University President Larry Summers observed that “operating our campus in an environmentally sustainable way is not only the right thing to do as a citizen and neighbor, it is also an economically sound way to conduct our business. As we plan for the future, these principles will set a strong course that will benefit Harvard and promote responsible growth and environmental quality in our community.”

See [www.greencampus.harvard.edu](http://www.greencampus.harvard.edu) for more information.

## Sustainability Influences A University's Reputation

Leith Sharp, the Director of Harvard's Green Campus Initiative, believes that *“multinational companies have learnt the hard way that their environmental and social performance - and the way in which this is embodied in activities and buildings - have a big influence on corporate and brand reputations. Universities - especially those who want to be global players - must learn the same lesson, for tomorrow's students, faculty and opinion-formers will pay great attention to this criteria when judging the institutions they will respect and support.”*



# Energy Efficiency

**Winner: University of Glasgow** - Lighting Control to Improve Comfort and Minimise Energy

## Key Points

- The lighting system has been shaped by user demands for natural lighting - and is delivering better comfort and reduced energy bills as a result
- Overall costs have been reduced by using one system to control lighting in three buildings
- The system has a payback period of 8-12 years on single building use, much less when all three are considered

The University of Glasgow's integrated control system currently manages lighting in the new 24/7 Wolfson Medical School and will do the same for the Cardiovascular and Biomedical Research Centres and the CRUK Beatson Cancer Research Facility buildings when they are completed in 2005 and 2006 respectively.

Initial consultation on the design for the Wolfson Medical School highlighted a strong user desire for natural lighting. This was achieved through a glass roofed triangular atrium at the centre of three accommodation blocks, and a sensitive control system to augment daylight with electric light when necessary. This is achieved through daylight controlled dimming, scene setting, blinds control or central time control. The system also controls the motorised solar blinds to regularly change their position during daylight hours. This reduces glare and unwanted solar gain, thereby reducing energy consumption for cooling.

Lighting use is also minimised through microwave presence detectors - initially installed in circulation corridors, stairs and toilets, and retrofitted in seminar rooms. They operate using a sensitive range, capable of responding to all movements no matter how small. On the detection of presence within the building by any of the microwave detectors a time delay of 20 minutes will start. If none of the detectors detect movement after this time within the area, the lighting will begin to dim and switch off.

Alterations and maintenance of the system is carried out via a site based PC, which allows University maintenance engineers to view the system on a room by room or floor by floor basis, with simple graphics informing of system condition. Manufacturers maintenance or system alterations are carried out via a dedicated high-speed modem link, therefore maintenance and re-programming alterations are carried out simultaneously and in a cost effective manner.

The University estimates that the system has reduced the annual School's electricity consumption by 166,093kWh, and electricity costs by £7,000, compared to a more conventional lighting scheme. The avoided carbon emissions of 18.8 tonnes per annum are also a potential credit in the EU Emissions Trading Scheme. In the future, the system should save 141,710kWh annually in the Cardiovascular and Biomedical Research Centres building, and 39,936kWh in the new CRUK Beatson Cancer Research Facility.

The total cost of design, installation and commissioning of the lighting control and management system was £85,000. This was higher than needed to control just the Wolfson school, but much less than the costs of three separate systems. Even so, the system has - just on its Wolfson use - a payback period of 12 years at the university's 2003 electricity prices, and 8 years or less at the prices it will be paying in future.

**Albert Young, Energy Conservation Officer, University of Glasgow**

*"We got user inputs at every stage - conception, design, construction and commissioning - so that we could deliver better functionality as well as reduced energy consumption."*



- UK higher education currently spends over £200 million pa on energy
- Electricity and gas prices rose by 40-70% on many contracts in 2004
- Universities and colleges will face new regulations such as the EU Energy Performance of Buildings Directive

## Highly Commended:

### University of Bradford

- Carbon Management Highlights Risks

The Carbon Trust and Yorkshire Forward have established a Carbon Management Club to help regional organisations reduce their CO2 emissions. The University became a founding member in 2003 and mapped its carbon 'footprint' from energy consumption, travel, refrigeration leakages and waste - which is around 23,000 tonnes of CO2 per annum. In response the University has set a target of reducing these emissions by 10% by 2009. The mapping and subsequent analysis - which included student projects - also identified cost-effective reduction opportunities. The exercise helped make the case for £156,000 of expenditure on boiler controls, swimming pool refurbishment and refrigeration servicing and maintenance. These will reduce energy consumption by £30-35,000 a year, and contributed to a 3% reduction in CO2 emissions during 2003-4. Further cost-effective savings will come from a new comfort heating policy, CHP and space rationalisation.

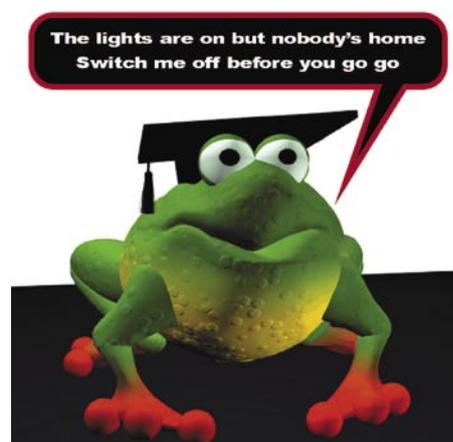
The Carbon Management initiative also involved calculation of the business risks from rising energy prices, and current and projected carbon regulation. It found that by 2009 the university could expect a best case scenario of a £50,000 per annum increase in costs, and a worst case of over £480,000. Jamie Sullivan, the University's Environmental Manager, believes that the initiative "has demonstrated to senior management that carbon emissions cost money. For example, uncontrolled car use has led to more car users, a greater number of car park spaces and ultimately a higher car park maintenance budget."

### Bournemouth University

- The 'Green Frog' Raises Awareness

In 2001, a University working group launched an awareness campaign about energy and water efficiency. The group wanted to give the campaign 'personality' and devised the 'Green Frog' - a computer-generated character that would appear on posters, emails, and stickers reminding staff to 'Switch Me Off Before You Go'.

The Frog generated great - and mainly positive - debate amongst staff and students, and contributed to a 4% reduction in the University's expected energy consumption during 2002-03, with further reductions in 2003-4. It also launched a new web site to communicate about all environmental issues ([www.bournemouth.ac.uk/save\\_earth](http://www.bournemouth.ac.uk/save_earth)). This includes waste, where a co-ordinated campaign doubled paper recycling during 2004. 'Spike', a student frog, was also spawned to front a campaign amongst students in University-managed residences.



Charles Elder, the University's PR Manager, comments that environmental campaigns don't have to be serious to be effective - humour is a vital part of marketing."

### Judges' Comments on Energy Efficiency

*"Energy costs are rising and universities and colleges must plan for more of the same. The University of Glasgow has done this through an admirably planned and executed lighting control scheme in the Wolfson Medical School, which will also improve energy efficiency in subsequent buildings. The scheme shows that energy efficiency can be 'win-win', because users benefit from greater use of natural lighting."*

*"There will also be greater regulatory and stakeholder pressures to minimise carbon dioxide emissions in future. The University of Bradford's comprehensive Carbon Management programme demonstrates that systematic mapping of emissions can reveal many cost-effective opportunities for reduction."*

*"Minimising energy costs and carbon emissions can only be achieved if people are aware of its importance, and help to achieve it in practice. The University of Bournemouth has stimulated this admirably through its simple and humorous 'Green Frog' campaign, which was devised by staff and students."*

# Sustainable Construction

## Winner: University of Newcastle upon Tyne - The Devonshire Building Makes A Statement

### Key Points

- BREEAM 'Excellent' rating
- An internal design which maximises flexibility and space utilisation
- 30% less energy consumption than current 'best practice'

In 2004 the University commissioned the Devonshire Building to house its new Institute for Research on Environment and Sustainability, the Informatics Research Institute and the North East Regional e-Science Centre. Two key aims were to have a striking design which symbolised the University's general and environmental-specific research ambitions, and to encourage greater interdisciplinary collaboration.

The building has a number of sustainable features and systems to utilise local climate conditions and natural resources. To maximize natural lighting, the south facade is 70% glazed. Solar gain and glare is reduced by the use of computerised Brise Soleil, which tracks the sun's path. This is supplemented by low 'E' solar reflective glass. Photovoltaic panels on the roof generate 25kW (peak) of electricity.

Inside there is intensive usage of floorspace through easily reconfigurable open plan offices, hot desking and large multi user labs. There are also distinct climate zones, ranging from closely controlled laboratories to a loosely controlled central atrium. The atrium acts as a 'climatic buffer', benefiting from passive solar heating and reducing heat loss and heat gain in adjacent spaces. This is one element in reducing energy consumption to 30% less than a current 'best practice' building. Overall, there is a high use of natural ventilation and heat exchange systems. Low velocity fume cupboards cut energy running consumption by 40%, reduce ductwork and plant sizes, and free up space within the building. Other energy efficiency elements are pre-heating of domestic hot water with heat recovered from office spaces and cold rooms; use of condensing boilers; sophisticated lighting control to maximize natural lighting and allow point control of consumption; and automatic opening windows to provide natural ventilation when the external conditions are correct, and also to facilitate night purge ventilation.

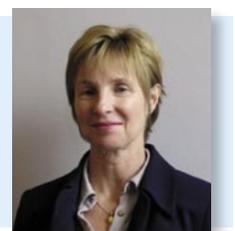


All materials used on the project were assessed for their recycling capability, life cycle cost and environmental impact, based on "The Green Guide". The large roof area of the building also collects rainwater for use in toilets and urinals. The rainwater is stored in a 20,000 litre primary, and a 40,000 litre overflow, underground tank which also provides a heat sink for the cooling water circuit.

These features enabled the University to achieve an 'excellent' BREEAM rating – the first of its kind for a building combining of-fice facilities and laboratories.

### Clare Rogers, Director of Estates, University of Newcastle upon Tyne

*"Good space management is environmentally, as well as economically, beneficial. More intensive utilisation of buildings can greatly reduce the need for new build to meet expansion, and therefore avoid the impacts of construction, and the production of building materials."*



- Research shows that green design features which add 0-2% to capex can save at least 10 times more on lifetime energy and other operating costs
- Tougher Building Regulations and other measures to drastically reduce CO2 emissions are inevitable
- Best practice 'green' buildings proclaim a university's ambition and future orientation

## Highly Commended:

### University of Hertfordshire - A Strategic Approach To A High Flying Campus

The £120 million de Havilland campus has consolidated the activities of two older campuses onto a single brown-field site (the former British Aerospace Aerodrome and factory) in Hatfield. This now hosts the Business School and Schools of Humanities and Education, a 460 seat conference and events centre, a sports village and 1600 residences. The academic buildings were a Private Finance Initiative project, whilst the sports village and residences were privately funded. The lead contractor, Carillion, was partly selected because of its willingness to support the University's environmental aims (as evidenced by recycling 65% of construction waste). Notable features of the campus include:

- Buildings with high thermal mass, natural ventilation, solar control and shading, and sustainably produced timber
- Residences which are 60% more energy efficient than typical examples
- 50% of electricity sourced from alternative energy
- Planting of 250 native trees and almost 30,000 other plants to maximise biodiversity
- Community involvement, e.g. through sports coaching for schools and student volunteer programmes.

The energy efficient design of the new campus will save approximately £3 million on energy bills over 25 years. This involved £109,000 of additional capital expenditure which should be paid back in under three years.

Nicola Corrigan, the University's Environmental Coordinator, believes that the outcomes are due to a strategic approach which "used the 'Natural Step' framework for general guidance, and a BREEAM 'excellent' target and whole life costing calculations for design details. To ensure operational as well as design sustainability, we have also set up a campus Environmental Management System."

#### Judges' Comments on Sustainable Construction

*"Sustainable buildings can reduce operating costs and anticipate tightening environmental regulation. They can also improve functionality – as with the well researched connection between natural cooling and ventilation and better staff morale and performance – and enhance an organisation's reputation. Achieving these benefits requires a holistic approach to design, which is demonstrated by both the University of Newcastle's Devonshire Building and the University of Hertfordshire's de Havilland campus. The Devonshire Building scored highly for its collaborative design process which carried the initial expectations through to the final result; its striking design; and its use of multiple energy efficiency and other environmental technologies. Most of these technologies are proven and cost-effective and therefore have widespread scope for replication.*

*The de Havilland campus also embraces sustainability in its widest context. It is a brownfield site which supports biodiversity, makes use of recycled materials, is energy and water efficient, and is available to the community. There has also been a strategy of maximising access by public transport and cycles. As with the Devonshire Building, BREEAM provided a mechanism to steer improvement, whilst the use of Natural Step and whole life costing provided additional impetus for improvement."*

## Winner: University of Southampton - Uni-link Provides Smart Travel Options

### Key Points

- Uni-link connects 14 University sites with each other, and with the city centre and air/ferry/rail links
- Passengers have grown by 30% per annum
- Residents pay for the service through an element included within the Halls fee structure

The University has 5 teaching sites and 9 major halls of residences, which results in staff and students making hundreds of thousands of journeys a year. These have been problematic as bus routes and timings did not align easily with academic timetabling. In 2001 the University established, in partnership with bus operator Minerva Accord, its own service, uni-link. By 2004 uni-link had grown to operate 14 buses, employ 35 staff, and operate 4 routes connecting the 14 sites with each other, the City Centre, and rail, coach, air and ferry interchanges. Services operate from early morning to late evening and remain frequent at weekends. Passenger numbers have increased by 30% per annum - probably faster any other UK bus operator - to reach 1,630,000 in 2003/4.

To increase viability, and to help local communities, the service is open to the public, who account for around 25% of term-time passengers. About 2% of external passengers are elderly people with concession passes whose 30p fare is made up to the full £1 flat fare by the Council. Many mobility impaired people also benefit from an unusual feature of uni-link buses - accessibility and substantial on-board space for wheelchairs. The space also provides a standing area for periods of high demand, and allows students to easily carry shopping to residences.

75% of passengers pay for the service through smart cards – which enables very efficient loading, and therefore high utilisation of buses. (This is also facilitated by separate entrance and exit doors, which are common in London but still rare elsewhere). Most are students who pay for annual smart cards through an average levy of around £200 on their hall fees. This provides around 43% of total uni-link revenues. Other smart card users either pay an annual fee of £220, or put ad hoc credit onto their cards through machines around the university or on the buses themselves. Around 25% of passengers pay cash - amounting to £500,000 in 2003/4 - on boarding.

In 2003/4 the University provided core funding of £200,000. This will halve in 2004/5, and income - which will increase through use of higher capacity buses - should cover all operating costs the following year. Uni-link's benefits include a reduction in staff inter-site travel expenses, greater flexibility in providing campus services, greater student satisfaction and safety (which influence national reputation and therefore future recruitment), and an improved image within the city. The scheme is also the main factor in 1000 less cars being parked by hall residents.

Uni-link is now playing a lead role in a relaunch of Southampton's real time information and bus management system, and in a citywide scheme to develop a single smart card to pay for many transport and other services. It is also extending its routes to serve other local bodies - in 2004 a sixth form college provided financial assistance to enable a new route to be opened to serve both its students, and the university's own needs, and a similar initiative with a local Hospital Trust is planned.

### John Waugh, Transport Services Manager, University of Southampton

*"Uni-link has succeeded because of the University's start-up support, careful selection and management of a good provider, and close attention to user needs - especially for a frequent and reliable service. In addition costs are low compared to the benefits of student satisfaction, operational efficiency and community reputation we have obtained."*



- Parking restrictions and charges do discourage car use – and will be accepted if funds raised are used for transport improvements
- Partnerships with innovative bus operators can dramatically increase usage

## Highly Commended:

### University of Derby

- A Car Pool Supports Travel Improvement

Until recently the Kedleston Road campus and the streets around it had a serious parking problem. Parking permits were ended for most full-time students and charges were introduced for staff (based on their salary) and part time students (a flat rate). An Automatic Number Plate Recognition system was installed to enforce the scheme, to enable rebates to infrequent users, and to make the car parks more secure.

The additional income enabled the appointment of a transport and travel manager; a halving of fares on the University's Unibus service (resulting in a near doubling of usage); and a car sharing website. In partnership with Toyota, a pool car scheme that includes a Prius hybrid has been established – and has the advantage of costing 25% less per mile than paying staff mileage expenses for their own cars. Further improvements are planned, with targets to reduce the percentage of staff commuting as single car users from 75% in 2004 to 63% in 2008, and to halve the number of student car journeys to campus over the same period.

James Brown, Transport and Travel Manager, believes that "the introduction of parking charges was controversial, but using revenues to solve obvious problems and achieve environmental goals has led most people to accept them."

### Oxford Brookes University

- Creating Attractive Alternatives To The Car

A Green Commuter Plan was introduced in 1999 and has been implemented through annual action plans, funded by a ring fenced £60,000 per annum from parking charges (which will be increased further when daily charges are introduced in 2006).

A 'BrookesBus' service linking the three main campuses with each other, and residences has – together with discounts on other Oxford bus services through a uni-rider pass – led to a fivefold increase in bus travel. This has also been encouraged by car exclusion zones on campus, and an on-line car sharing scheme (subsequently expanded to cover Oxford University, 4 local hospitals and the City Council). Cycling has been supported by providing showers, weekly cycle maintenance sessions and a cyclist's mailing list. A leaflet also details four different walking routes to the Headington Campus, and the calories they should burn off!

Harriet Waters, the University's Environmental Co-ordinator, stresses the importance of "regular marketing of travel plans and improvements around the University to keep the issue in the forefront of people's minds. BrookesBus even has a website ([www.brookesbus.net](http://www.brookesbus.net)) which is interactive, and gives timetables and journey times – it actually makes public transport look 'sexy'!"

### Judges' Comments on Transport

*"The trend for more higher education staff and students to commute to and from campuses by car contributes to congestion, is incompatible with the Government's targets for reductions in CO2 emissions and air pollution, and is less healthy than cycling or walking. The University of Southampton's pioneering uni-link bus service shows that the trend can be reversed through thorough "homework" to identify and then address the deficiencies of existing provision; progressive improvements to bus and cycle alternatives to the car, and excellent marketing. The result is a better student experience - which helps recruitment – and benefits to local communities.*

*The successful schemes at Derby, Hertfordshire, Oxford Brookes and Sheffield Universities also suggest that parking charges and restrictions – whilst always controversial - can be helpful in encouraging switching from cars, but only if the revenues are applied to the development of more sustainable alternatives. Notable measures include the University of Derby's halving of student bus fares and development of a car pool, Hertfordshire and Oxford Brookes' well marketed bus services, and the University of Sheffield's formal partnership with local hospitals and other organisations. All five universities have also found business as well as environmental benefits, including improved reputation amongst host communities and students and freeing up of parking space for other uses."*

## Highly Commended:

### University of Hertfordshire

- A Beacon For Other Bus Operators

Universitybus - recently re-branded as Uno - was originally set up in 1994 to provide students with an intercampus shuttle. The service has since expanded to 51 modern buses (with an average age of 5 years, well below Government targets) serving 12 routes throughout Hertfordshire and North London. Free shuttles are provided for students between the main campuses at Hatfield as well as from the free Park and Ride that the University provides for students and staff. Staff and students have a choice of paying subsidised fares or getting an annual zone-based pass for other journeys. Although the company is student focused, it also provides a public service, with non-university passengers making up 60% of total bus patronage.

Uno has enabled the University to achieve its travel plan target of raising the number of students commuting by public transport from 38% in 1999 to 27% in 2007. It has also improved recruitment of students from North and North West London. In September 2002 Uno moved to a new purpose built depot located on Hatfield Business Park. Scott Copsey, the University's Travel Plan Coordinator, observes that "the depot has high energy and water efficiency and other environmentally positive features which we hope will act as a beacon to other local bus operators."



### University of Sheffield

- The HUMUS Partnership Reduces Car Use

In 2003 the University was instrumental in establishing the HUMUS Partnership to develop sustainable transport solutions to the congestion and parking problems around its campus and adjacent hospital and museum sites. The other partners are Sheffield Teaching and Children's Hospitals, Sheffield Galleries and Museums Trust, Sheffield City Council and South Yorkshire PTE. The first stage involved travel surveys in each partner to establish baseline information, and the recruitment of a Travel Plan Co-ordinator.

The second stage implemented measures such as common car parking permit criteria and charges (where the University is leading the way by ring fencing the income raised for environmental improvements); additional bus services (including one creating work opportunities in the high unemployment zone of North Sheffield by linking it to the University and Hospital quarter); sustainable transport events and exhibitions; personalised journey planners and discounted public transport ticketing for staff; participation in the South Yorkshire Travelwise Car Share Scheme; pedestrianising, and therefore improving, an area notorious for 'rat running' traffic and being a 'red light district'; and support for cycling by installation of showers and storage facilities, and running awareness events such as Bikers Breakfasts and Dr. Bike Clinics.

For Julie Kiely, the University's Travel Plan Co-ordinator, "working together has given an extra impetus to all the partners. This will continue with a new 5 year collective target of reducing the overall number of single occupancy car trips to our HUMUS sites by 1,800 a day."

### Judges' Comments on Sustainable Procurement

*"Sustainable procurement is vital as purchased goods and services have great influence on HE's environmental performance. By directing attention to the whole life costs of purchases, it also embodies best purchasing practice. Leeds Met has a prolonged track record of implementation, which is symbolised by the title of Purchasing and Environment Office, and its actions to raise awareness amongst suppliers and internal buyers. The result is better environmental and financial performance - and an improved reputation."*

# Sustainable Procurement

## Winner: Leeds Metropolitan University - Procurement For The Long Term

### Key Points

- Leeds Met began its initiative in 1993 and continues to develop it
- Sustainable procurement rests on whole life costing – and is therefore good purchasing practice
- Continuous dialogue with both suppliers and devolved buyers is crucial

Leeds Met's commitment to sustainable procurement began in 1993, when the Purchasing and Environment Office was established. An Environmental Purchasing Policy was produced in 1995 and has since been implemented through environmental purchasing criteria (see graphic below) and a detailed environmental purchasing guide, which has been replicated by other universities in the UK, US and Australia. The criteria are used to assess each new contract. And they are publicised to devolved buyers via a Pocket Guide to Purchasing, and an environmental session within their procurement training.

Environmental issues are also incorporated into Leeds Met's biennial Supplier Fairs, which promote contracted suppliers to devolved buyers. In the 2004 event, a university supplier, Premier Paper, gave a keynote speech on environmental issues in paper supply.

The university also assesses the environmental performance of its top 100 suppliers through an annual questionnaire. Individual scores - together with data on the average performance of the relevant supplier group – are fed back. Leeds Met has committed to engage in two way dialogue with at least 20 suppliers and share best practice with and between them by December 2005. The commitment is one of the targets introduced as part of the Office's certification to the environmental management standard ISO14001 in September 2003 – making Leeds Met one of the first universities to achieve it.

The benefits from sustainable procurement to date include:

- Weekly delivery of stationery, which has cut out 400 deliveries, reduced packaging, cut purchase costs by 1%, and saved on porter's time.
- Sourcing 85% of electricity needs from renewable sources at no extra cost – and a 7,000 tonnes reduction in indirect CO2 emissions.
- Diverting 28% of waste from landfill to recycling through contract incentives – producing unchanged expenditure on waste disposal despite inflation and increases in landfill tax.



**Before you buy –**  
**Think environment**

- Does the product include recycled materials?
- Does the product carry an eco-label?
- Does the equipment have low energy/emission rating?
- Is there a way of reducing packaging?
- How will the product be disposed of?
- Is the supplier ISO 14001 or EMAS accredited?

### University Comment - Mike Briggs, Purchasing and Environment Manager

*"The perception that environment makes purchases more expensive is largely incorrect when whole life costing is applied – so sustainable procurement is also good purchasing practice. But environmental purchasing is not an additional task or a short term policy. To succeed it must be integrated into normal purchasing processes."*



# Waste

## Winner: Leeds Metropolitan University - Ambitious Targets Cut Waste and Save Money

### Key Points

- Leeds Met has an ambitious target of diverting 40% of its landfilled waste by end 2005
- Most IT equipment is reused, reconditioned or recycled
- Environmental Rules for Contractors are being developed

In 2001 Leeds Met set a target of recycling 25% of the waste it was then sending to landfill by 2006. This was achieved by 2003, and the university set a new one of 40% diversion by end 2005. Successful measures include:

- Many more recycling bins, with a policy of three recycling bins for every waste bin in large offices, and a recycling bin near every vending machine.
- Collection of all redundant IT equipment. Any which can be reused internally is separated, with the remainder - 12 tonnes of monitors, 12 tonnes of base units and 1 tonne of printers in 2004 - being sent to a local community recycler, Roseville Enterprises for reconditioning or disassembly. Roseville's income from this supports its social aims of providing every child in care in Leeds with a reconditioned computer, and maximising employment of people with disabilities. In 2004 the scheme created net benefits of over £1,500 for the university. Allowing staff to take computers home saved a further £508.
- Glass recycling also produces net benefits of over £1000 per annum. All glass from the student union bars is collected weekly resulting in an average 30 tonnes being recycled at a cost of £250 per year.

Other recycling schemes include wooden pallets (sent to a steam train museum), CD-ROMs, mobile phones and toner cartridges. Proceeds from phones and cartridges are donated to charity.

These initiatives have been underpinned by a new 'pay by weight' waste disposal contract. This was introduced to the sector by the University of Derby (the subject of a HEEPI case study), and involves the contractor measuring the amount of material in all collected bins and containers and billing accordingly. This enables cost savings through optimisation of collection patterns, and highlights target areas for minimisation initiatives. To maximise incentives for recycling, Leeds Met's contractor (Onyx) keeps all income from selling recycled material.

Recycling is publicised through e-mail updates, articles in newsletters, short 'Tool Box Talks' for staff and contributes to several undergraduate courses. The latter includes a module for second year design students who are asked to develop solutions to recycling problems faced by the University. A cash prize is given as an incentive.

One remaining challenge is to reduce waste from refurbishments, capital projects and maintenance. As a result Environmental Rules for Contractors are being developed to ensure that they are supporting the university's recycling objectives, as well as being in compliance with relevant environmental regulations.

### Mark Warner, Environmental Manager, Leeds Metropolitan University

*"Getting cleaners and porters on board is especially crucial – they will make or break a scheme as they talk to staff, report on what's actually happening and ensure initiatives such as flat packing actually take place."*



- European legislation such as the Landfill and WEEE Directives will raise waste costs, and require much more recycling, over the next decade
- Waste minimisation often creates financial as well as environmental benefit

## Highly Commended:

### University of Cambridge

#### - Information Underpins Recycling

Recycling at Cambridge requires co-ordination of activities at over 300 operational buildings, many with severe space constraints and restricted access. To improve communication the Environmental Office provides regularly updated web information including:

- A Waste Handbook, which provides detailed guidance on all aspects of waste management, including information on legislative requirements and details of recycling, disposal and waste minimisation options.
- A map of recycling facilities – currently static but likely to be interactive in future.
- A University Environmental Bulletin, Green Lines, highlighting new regulations and issues.

There is also regular e-mail contact with a network of over 100 Departmental Environmental Co-ordinators.

Specific measures include recycling facilities for paper, cardboard, glass, aluminium cans, fluorescent tubes and off-site composting of green waste.

Ian Watson, the Environmental Technician working on the initiative, believes that Cambridge's decentralised approach to waste management "avoids the risk of large-scale failures, and allows quick wins to be achieved so that others will follow."

### University of Glamorgan

#### - ISO14001 Drives Waste Reduction

When Glamorgan became the first UK university (and one of the first in the world) to gain certification of its environmental management system to ISO14001 in 2002, improved waste management and recycling emerged as priorities for improvement.

Since then recycling rates have grown to 52 tonnes of glass, 91 tonnes of metal and 26 tonnes of cardboard a year, creating a financial saving of £23,000. The number of collections has also been reduced through a compactor, which has saved £15 -£20,000 a year. Use of crushed glass as an aggregate for surfacing the university's car parks is also being examined. Paul Rossiter, the University's Assistant Energy and Environmental Manager, believes that "the new waste management systems have required minimal capital expenditure but have cut out 58 skip collections a month, and saved over £40,000 per annum."



### Judges' Comments On Waste Minimisation

*"Universities and colleges are facing increased regulation, and stakeholder pressure, to achieve waste minimisation. Leeds Metropolitan University provides a best practice example of what can be done if ambitious targets are set, and there is committed and sustained action to achieve them. Its reuse of electronic equipment, training of cleaners and porters, and involvement of a wide range of students, are especially noteworthy.*

*The University of Glamorgan shows that waste volumes and costs can be cut even within a couple of years. As with Leeds Met, ISO14001 highlighted the importance of, and opportunities for, improvement in what is often a 'cinderella' area, and education and training of staff and suppliers was given high priority. Provision of reliable and user friendly information is also a feature of the University of Cambridge's recycling initiative, and has helped to overcome the problems of taking co-ordinated action within a federal college system."*

## Winner: University of Sheffield - Benefits Flow From A Water Minimisation Strategy

### Key Points

- Water costs at Western Bank have been cut by over £100,000 a year, with a payback of under four months
- The University worked closely with Yorkshire Water
- The initiative is now being rolled out to other buildings

When its water costs began to exceed heating costs, the Energy and Environment Team began a detailed analysis, using benchmark data from the Watermark project ([www.watermark.gov.uk](http://www.watermark.gov.uk)) to understand the reasons, and to identify opportunities for improvement. This identified the main science-based site, Western Bank, as the priority area, with consumption more than double recommended levels, mainly because of a huge baseload.

Working with Yorkshire Water, an improvement plan – based on detailed site surveys and discussions with numerous building users and maintenance staff – was developed. The actions included mapping the underground pipework, installation of over 900 fast payback water saving devices - urinal controls, tap regulators, self-closing taps, and cistern volume reducers - and installation of sub-metering with remote monitoring facilities.

The exercise also revealed that some water conservation techniques had been introduced in the past, but no longer functioned effectively. A maintenance regime was therefore implemented to ensure that water-saving equipment continues to operate as designed.

The improvement plan was completed by late 2002 – little over a year after the exercise began - and over the next year consumption fell by 30%, and costs by more than £100,000. The investment costs were around £40,000, and had a simple payback of under four months. The original intention of quickly initiating a second stage at Western Bank (and of closely tracking changes in consumption) was delayed by unanticipated refurbishments but has now begun.

Another unexpected benefit of the plan was first revealing - and then, through the reduction of demand, solving - problems of low water pressure in some zones. Publicity about the scheme and its successes have also raised awareness of water issues across the University.

In 2004 the same approach was adopted for the University's next largest water-consuming area, the St. George's complex. This is expected to produce a 26% reduction in consumption and annual financial savings of £27,000. It will also incorporate learning from Western Bank. The work will be broken down into smaller tranches, involving fewer departments, to allow better management of contractors and improved liaison with users. This will also make it easier to co-ordinate energy and water efficiency measures, for example, by linking urinal controls with toilet lighting and ventilation.

### Phil Riley, Energy Manager, University of Sheffield

*"This project proves that water conservation needn't be complex, and that the introduction of simple tried and tested techniques can often achieve paybacks of less than 12 months."*



- Water and sewerage costs may exceed those for heating – and often have greater potential for reduction
- Payback from water efficiency investment is often under a year
- The energy required to supply a megalitre of water creates 404kg of CO2 emissions

## Highly Commended:

### University of Brighton

- Saving On A Rainy Day

In 2003 one of the sector's first rainwater recovery systems was installed in the Watts Building. The system collects water from the roof, and then filters it into a collection tank before use in toilets and urinals throughout the building. In periods of low rainfall the system switches automatically to mains supply.

The scheme has reduced the building's water consumption by 31%, and water costs by £2,446, giving a payback of 4.4 years. An additional benefit is reducing the load on an over burdened storm drainage system in the locality.

David Anderson, the University's Energy Manager, believes that "rainwater recovery should be feasible in most new buildings. It's a low cost, low maintenance, way of conserving an increasingly scarce resource, as well as saving money."



### University of Cambridge

- Metering Saves Water

Since 1988 the University has regularly analysed the 'baseload' and normal consumption patterns for its buildings. Any anomalies – such as unusually high baseloads, or sudden variations from expected consumption (which are usually due to leaks or other wastage) - can then be investigated and, if necessary, remedied. These measures enabled a reduction in water consumption by over 50% - and the annual water bill by over £500,000 - between 1988 and 2003.

In 2003 Cambridge Water replaced older meters with ones producing electronic data, in exchange for the University installing loggers and communications equipment to capture the data (at 15 minute intervals) and send it via SMS to a central PC. Cambridge Water uses the data to manage its system and schedule maintenance, whilst the University can do more detailed and timely analysis and has ended manual meter reading.

Paul Hasley, the University's Utilities Manager, notes that "the total investment in the system - mainly by my predecessor, Dick Ramsay - has been £120,000. Its value was demonstrated when some equipment failed in one of our laboratories. The data enabled us to quickly spot the wastage which could otherwise have amounted to £74,000 by the time we noticed an unusually high water bill."

## Judges' Comments on Water

*"Until recently, water efficiency has generally received less attention than energy efficiency. But rising costs, and the realisation that water is an increasingly scarce resource whose cost will continue to rise, are stimulating action. Fortunately, past neglect means that there are usually many cost-effective minimisation measures available, as the University of Sheffield's admirably planned and executed initiative shows.*

*The University of Cambridge has also benefited from partnership with its water supplier. Its more incremental approach demonstrates continuing improvement opportunities, which are made accessible through its exemplary long-term commitment to investment in metering.*

*One water minimisation option is making use of rainwater for low-grade needs such as toilets. The University of Brighton's impressive installation demonstrates that this can be cost-effective, especially in new buildings."*

# About HEEPI

The HEFCE-funded Higher Education Environmental Performance Improvement (HEEPI) project is based at the University of Bradford. Its management board includes representatives from the Association of University Directors of Estates (AUDE), BRE, the Environmental Association for Universities and Colleges (EAUC), and the Standing Conference of Principals (SCOP).

HEEPI's aims are to develop better information on the environmental performance of universities and colleges, and to strengthen the capacity of their senior and operational managers to use this information to drive improvement. Since its inception in 2001 HEEPI has:

- Delivered many seminars on issues as sustainable construction, sustainable procurement, energy and water efficiency, and transport and waste minimisation
- Written case studies and guidance documents, most recently on utilities and waste management and sustainable construction
- Run an accredited training programme in environmental auditing
- Developed an on-line advice centre, the Environmental Virtual Campus
- Developed a database of energy and water consumption in over 300 buildings
- Developed for general use a low-cost on-line survey of university transport impacts.

For more information visit [www.heepi.org.uk](http://www.heepi.org.uk) or contact the HEEPI Co-Directors, Professor Peter James and Dr. Peter Hopkinson via [info@heepi.org.uk](mailto:info@heepi.org.uk) or at:

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