The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

Sustainability Report 2009/10

www.nottingham.ac.uk/sustainability

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Introduction

A number of major new sustainability initiatives took place during the last year. The University's vision is to become 'a leading green university', in our teaching, learning, research, campus operations and governance. Our Environmental Strategy was launched in early 2010, providing a framework for delivery of our environmental programmes. This included the operational work centred on waste management, travel, energy and grounds and also green IT, procurement, research and campus development. The Strategy encouraged the inclusion of sustainability in our teaching & learning programmes and this is now one of the central requirements in the University's 2010 Strategic Plan. This focuses on 8 main themes, one of which is *Our Environment,* with reductions of carbon dioxide emission and improvements in waste management key objectives.

A new Sustainability Directorate was established in December 2009 to lead this agenda. This provides a focus for managing existing environmental, energy and grounds programmes and also to develop new initiatives.

We gained our 8th successive Green Flag award for University Park, with the judging criteria requiring strong evidence of environmental and community programmes. We also won our first Green Gown award for integrating sustainability into our grounds management and building designs.

A new waste management contract commenced in September 2010 to improve our waste segregation and recycling performance and to significantly reduce quantities of waste landfilled.

We have developed a new Carbon Management Plan for approval in late 2010. The Plan proposes absolute carbon dioxide (CO_2) reduction targets of 13% by 2015 and 34% by 2020, both from a 2005/6 baseline. It will set in place a new investment programme for energy reductions, efficiency improvements and energy generation from renewables. The Plan is in line with HEFCE's carbon reduction strategy and requirements in the UK's Climate Change Act 2008, to improve carbon management and help the transition towards a low-carbon economy.

This report summarises progress made against our key environmental objectives and provides examples of best practice achieved. For more details of our work please see www.nottingham.ac.uk/sustainability

Waste and Recycling

Key achievements in 2009/10

- Additional on-street recycling facilities installed
- Battery recycling scheme introduced for portable batteries
- Comprehensive computer recycling scheme set up with new IT supplier
- An increase in campus construction projects led to approximately 1,000 tonnes of excavated soil being taken off site and reused (this is reflected in the increased waste arisings and increased recycling rate reported in the KPIs table below)
- Waste and recycling contract retendered, resulting in reduced costs and lower quantities landfilled (see box below)

KPIs

Indicator	2008/9	2009/10
Waste mass generated per m^2	7kg	9kg
Proportion of waste recycled	30%	41%

New waste contract

September 2010 saw the start of a new waste contract aimed at providing a cost-effective waste management service that maximises resource potential and minimises waste sent to landfill. Under the new contract local waste company Wastecycle collect three main waste streams:

- Mixed recycling - this includes glass, paper, card, plastic and tins. This material is taken to Wastecycle's sorting centre at Colwick where the waste is sorted, bailed and sold on to the commodity market to be made into new products.
- Food waste – is collected from all halls of residence and a number of catering outlets on campus. Through in vessel composting it is transformed into peat free compost.
- General waste – traditionally this has been sent to landfill, however our waste now goes through a sorting process to remove the maximum amount of recyclable material. The residual waste goes through a process to run it into a RDF material (refuse derived fuel) from which energy is recovered, resulting in very little waste going to landfill.

During the first month we generated a total of 313 tonnes of waste. Nine tonnes of this was food waste that has been turned into compost; we segregated 90 tonnes on campus through our mixed recycling schemes; and from the remainder, 168 tonnes were recovered / recycled through the sorting process, resulting in only 15% of the total waste going to landfill.

As well as the environmental benefits of recycling there are clear financial benefits to the University, as landfill tax continues to rise (currently £48/tonne, but due to increase to £56/tonne in April 2011). The maximum savings come from eliminating waste and then segregating our waste on campus via our mixed recycling bins. It is cheaper to recycle waste rather than landfill it. The financial saving as a result of our waste segregation on site in September was £2,200.

We have set ourselves an on site segregation target of 40% by 2011/2012 and we need your help to achieve this!

Next steps

- Install further recycling facilities
- Improved awareness campaigns, including tours to Wastecycle's recycling facility
- Roll out food waste recycling scheme
- Work with suppliers to increase amount of packaging returned

Energy and Water

Environmental issues related to energy generation and usage have become of increasing importance globally and a new focus is on reducing carbon dioxide (CO_2) emissions. Whilst the University has always actively managed its energy to reduce waste and minimise utility costs, the need to reduce CO_2 emissions is now driving our efforts in this area.

The University's Strategic Plan 2010-2015 commits the University to challenging reduction targets of 15% on energy and 20% on CO_2 emissions by 2014/15. The path to achieving these targets will be detailed in a new University Carbon Management Plan (CMP). The CMP will provide a new major investment programme from 2010/11 onwards for reducing our CO_2 emissions by improving energy efficiency and developing renewable energy systems. Investment will be centred on reducing scope 1 (combustion of gas for energy generation and heating) and scope 2 (electricity usage) emissions.

Key summary for 2009/10

- Energy costs, including taxes, were reduced by £2.0 million to £9.3 million. This was largely due to our policy of purchasing energy on a monthly basis.
- Overall energy consumption increased by 3% in 2009/10. Electricity consumption however remained unchanged - an improvement on the average rise of 2.5% a year over the last four years, but gas consumption rose by 5%.
- Overall emissions of carbon dioxide from all energy sources rose by 1.76% due to increases in gas usage in the winter period and expansion of the estate and student numbers. However the overall premises Gross Internal Area increased by 3%, and student numbers were up by 5.6%. The weather, as measured by 'degree days' was colder by 2.6% compared to 2008/9.
- Water usage increased by 13%, although most of this increase was due to 2008/9 figures including estimates of consumption that were artificially low.

KPIs

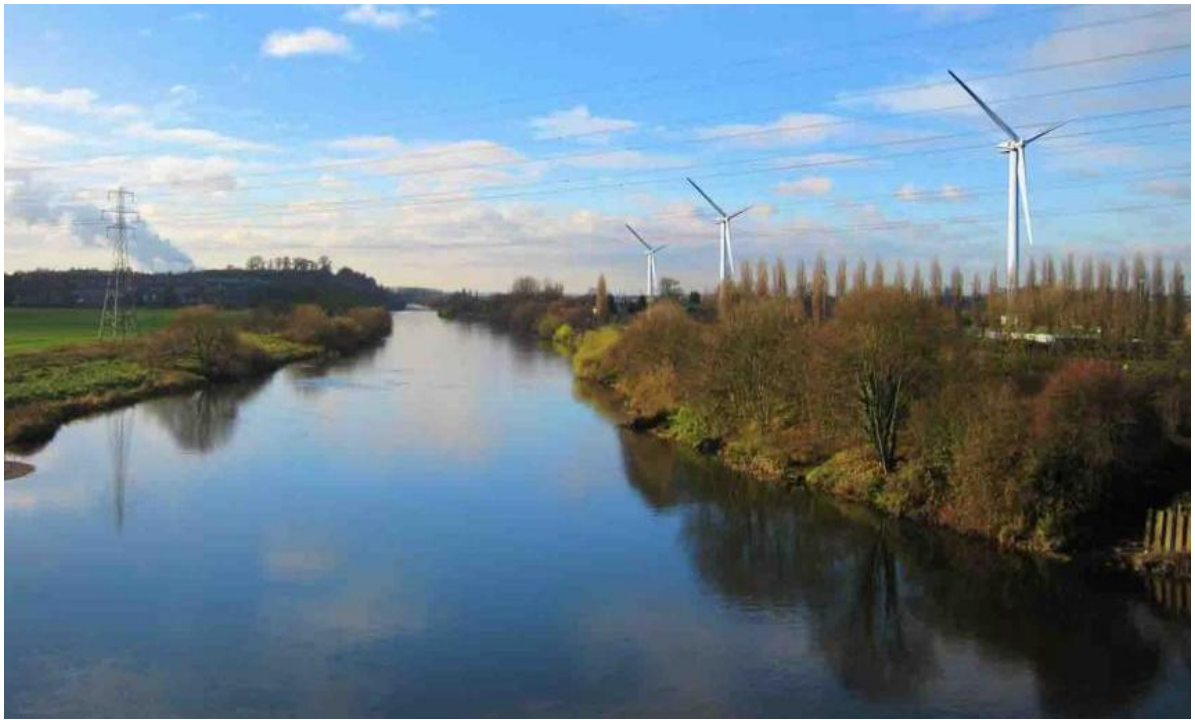
Indicator	2008/9	2009/10
Energy consumption per m^2	353 kWh	353 kWh
Energy emissions per m^2	120 kg CO_2	119 kg CO_2
Water consumption per m^2	1.2 m^3	1.3 m^3
Total carbon emissions from energy	67,168 t CO_2	68,626 t CO_2

Salix carbon fund

The University secured a £300,000 loan from Salix to invest in energy/carbon saving projects. Examples of projects in progress included free cooling and lighting controls in King's Meadow data centre, new controls for air handling units in the Medical School, new floor insulation in Derby Medical School and the PowerMan/WakeMan computer software (see page 11). New future projects are being identified in line with the University's Carbon Management programmes. Initial examples identified include new/upgraded insulation in 3 halls of residence and Biology building; lighting controls in 5 academic buildings; Building Management System and heating controls in 6 buildings; and improvements in fume cupboard energy use.

Next steps

- Finalise and obtain approval of Carbon Management Plan
- Identify and progress main areas for investment in energy reductions, energy efficiency improvements and the installation of renewable energy systems
- Complete wind farm design and scoping and submit for planning approval in 2011

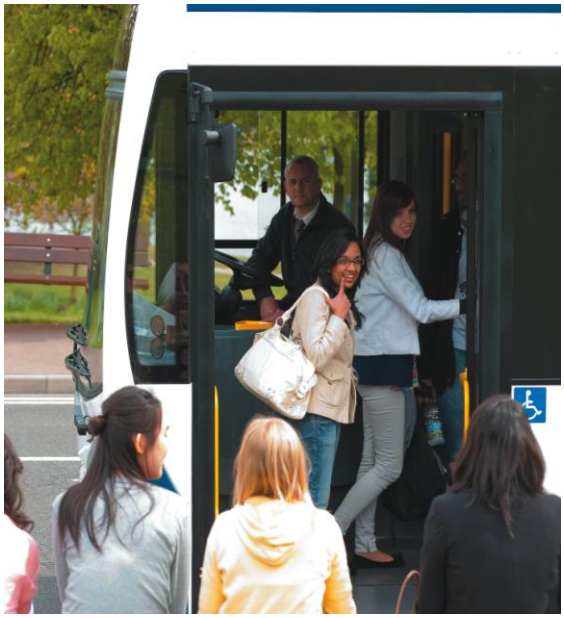


Photomontage of Grove Farm wind farm (Clifton Boulevard flyover)

Travel and Transport

Key achievements in 2009/10

- New three-year contract for the University's hopper bus service has resulted in a brand new fleet of lower emission vehicles operating an extended timetable
- Joint initiatives with local bus operators have continued to increase bus patronage – number of passengers on Nottingham City Transport routes serving the University's campuses increased by 7% in 2009/10 (compared to 2008/9)
- Travel and expense policy has been revised to increase the bicycle business mileage allowance from 5p per mile to 20p per mile
- Ucycle Nottingham project has increased levels of cycling amongst staff and students (see box below)
- New cycle path constructed on Jubilee Campus to provide easier access from Derby Road to campus spine road



KPIs

Indicator	2008/9	2009/10		
Mode of transport used for commuting		Mode	*Staff (%)	Student (%)
		Bus, Train, Tram	11	22
		Cycle	13	10
		Car, on own	57	14
		Car, with others	10	-
		Foot	8	55
		Other	1	0
Number of staff taking part in Cyclescheme	132	168		
Bus patronage on hopper bus services (number of trips)	573,641	639,862		

* Data from staff travel survey undertaken in February 2009

Ucycle Nottingham

Ucycle Nottingham has been set up in partnership with Sustrans to increase the numbers of staff and students cycling at Nottingham's universities and hospitals. The project is hosted by The University of Nottingham, with three out of the five project staff (including the University's project officer, Sarah Fraser) in a project office within the Biology Building.

Halfway through the two-year project, Ucycle Nottingham has run a range of events on campus including monthly Dr Bike clinics, secondhand bike markets, bike breakfasts, guided cycle rides and bike maintenance workshops. There's a bike buddy scheme that matches new and returning cyclists with experienced cyclist commuters, and Ucycle

Nottingham leads a Bicycle User Group that enables staff and students to discuss all things bike-related.

In addition to running activities that raise awareness of the benefits of cycling, Ucycle Nottingham also works with partners to facilitate infrastructure improvements on and between campuses.

The results of Ucycle Nottingham's travel diary studies show that the average number of trips by bike has increased during 2009/10. Staff cycling to and from work increased by 10%, whereas the number of students cycling to the University has doubled – in just six months!

Next steps

- Launch travel pass scheme that enables staff to purchase discounted bus passes through Payroll
- Develop 'pool bike' scheme for staff
- Work with partners to assess the feasibility of building a new train station on Faraday Road, to serve Jubilee Campus
- Improve cycle storage facilities.

Procurement

Key achievements in 2009/10

- Sustainable Procurement Policy has been developed by Procurement
- Inclusion of environmental criteria in tender specifications has contributed to improvement in University's environmental performance, e.g. award of new computer equipment, waste management and hopper bus contracts
- The University successfully renewed its application for Fairtrade University status

- Worked with suppliers to consolidate deliveries, thereby reducing transport-related emissions, e.g. office furniture and computer deliveries
- Electrical catering equipment that becomes redundant is replaced with the most energy efficient model available
- Waste cooking oil is collected and used by the Faculty of Engineering to manufacture biodiesel

Next steps

- Procurement to lead review of policies and major spend programmes to ensure sustainability criteria are in place.
- Begin scoping programme to measure associated carbon emissions with product purchases

Campus development

Key achievements in 2009/10

- Nottingham Geospatial Building, situated on the University of Nottingham Innovation Park, achieved a BREAAM rating of 'excellent' – the highest available at that time (BREEAM - Building Research Establishment Environmental Assessment Methodology, is a widely-used assessment method for the environmental performance of buildings)
- Plans approved for £0.75m project on University Park campus to widen peripheral roads to improve routes for pedestrians and cyclists, with construction starting in autumn 2010. This is the first phase of work to pedestrianise the central area of the campus.
- Energy Technologies Building, due for completion in January 2012, has been designed with a view to achieving a BREAAM rating of 'outstanding'

KPIs

Indicator	2008/9	2009/10
Building Display Energy Certificates / Energy Performance Certificates achieved	Amenities Building – Category C (73) International House - Category C (71)	Nottingham Geospatial Building – Category B (38) Clinical Sciences Building Phase 2 – B (43)
Awards for sustainable construction / design	• 'Nottingham Science City Development Project 2009' - The Sir Colin Campbell Building • 'Outstanding Estates Initiative' in the *Times Higher Education* Leadership & Management Awards - Jubilee Campus Expansion • Design Excellence Award Sponsored by EMDA - Jubilee Campus Expansion • Best Environmental Design - CSET Building on the China (Ningbo) Campus	

Green designs for teaching and learning

Construction is underway on a major new building programme that will see three new state-of-the art teaching and learning facilities developed on University Park, and a fourth on the Sutton Bonington campus. All four buildings have been designed with environmental sustainability in mind, minimising demands for heating, cooling, lighting

and ventilation from non-sustainable sources, whilst maximising energy from renewable and ambient sources and considering the environmental impact of the construction materials and techniques used.

- Engineering and Science Learning Centre - contemporary horseshoe design will provide three floors of accommodation with a large central atrium covered by a clear ETFE (Ethylene TetrafluoroEthylene Co-Polymer) roof, the material used for the Eden Project Biomes in Cornwall. ETFE transmits more light than glass, aids temperature regulation and is recyclable.

- Humanities Building - will rely on water source heat pumps using bore holes 100 metres deep to keep the building cool in summer and warm in winter.

- Mathematics Building – will have a 'living' roof containing over 30 varieties of local flora that will provide a habitat for wildlife and help improve drainage.

- Biosciences/Veterinary Medicine and Science Teaching and Learning Building – walls are constructed from compressed straw bales, which offer high levels of thermal insulation with low embodied carbon. A small-scale combined heat and power system will reduce CO_2 emissions by approximately 15% compared to conventional systems.

In addition to these buildings, a Bioenergy Centre is being built to house a Sustainable Bioenergy Centre research programme, Food and Biofuel Innovation Centre and a brewing research facility. Approximately 19% of the Bioenergy Centre's total energy requirement will be met by a wood pellet-fuelled biomass boiler.

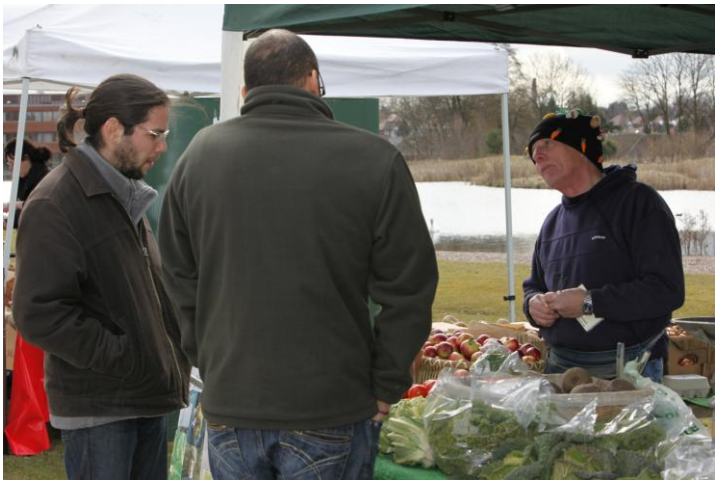
Next steps

- Develop a climate-neutral building for a new 'green chemistry' research and development facility on Jubilee campus, to be operated in partnership with GlaxoSmithKline
- Review environmental specifications in the Standard Elemental Requirements for new builds and refurbishment projects

Awareness raising, training and communication

Key achievements in 2009/10

- Go Greener campaign (see box on p10)
- Launch of Student Eco-warrior Network
- Environmental Champions Network awarded 'Living for Tomorrow' award at Nottinghamshire Wildlife Trust's Green Guardians Awards for engaging staff on environmental issues and encourage sustainable practices
- New 'Green Rep' position developed on Junior Common Room committees for 2010/11 elections to help promote environmental action in halls of residence



- Participated in a range of national and international environmental awareness campaigns, including WWF's Earth Hour, Bike Week and BBC Radio Nottingham's Big Switch Off
- Students' Union received a Silver Sound Environmental Impact Award – an environmental accreditation scheme for students' unions. Installing water fountains in the Students' Union building, recycling toner cartridges and batteries, campaigning, and holding ethical events like Sounds on the Downs all contributed towards this year's Silver award.
- Energy and Climate Change Special Lecture Series, open to members of the general public, staff and students, and run as part of the University's commitment to educate and disseminate information on pressing global issues

Go Greener

The Go Greener communications campaign was launched in March 2010. The campaign aimed to highlight the University's green achievements, raise awareness internally of how the University is continuing to address environmental issues, and encourage green behaviour amongst staff and students. The month-long campaign included the publication of the University's first Environmental Strategy and a range of Go Greener Week events.

An initial email from the Vice-Chancellor, together with campaign messages on the intranet portals, coverage in Exchange magazine, podcasts from across the University community, and a campaign mini-site (www.nottingham.ac.uk/gogreener) all helped to promote the campaign. In fact, there were 670 visits to the Go Greener website on launch day alone! A pledge form enabled people to join the campaign and show their commitment to a greener campus.

Go Greener Week events included an opening presentation from Nottingham's 'Queen of Green' Penney Poyzer, Dr Bike sessions, a vintage clothes sale, tours of the eco-houses within the Department of Architecture and Built Environment, a tree walk and the ever-popular local food markets.

In addition to internal communications, the University's environmental credentials and research have been highlighted at the Community Open Day held in April and included in high-level web pages on the University website. There is also now a refreshed green section in the postgraduate prospectus.

Next steps

- Develop a training programme for staff Environmental Champions
- Research students' awareness of and attitudes to environmental issues, pro-environmental behaviours and University-led environmental initiatives
- Enhance the Sustainability Directorate's web presence, to reflect the broader scope of the Environmental Strategy

Corporate governance

Key achievements in 2009/10

- "Leadership in environmental sustainability" recognised as one of the guiding principles of the University's new strategic plan
- Terms of reference for Environment Committee revised to reflect the broader scope of the Environmental Strategy
- The University has to include carbon management in its annual financial report
- Participation in EcoCampus programme to develop an environmental management system

KPIs

Indicator	2008/9	2009/10
Rating in BITC Environmental Index	63.04%	70.1%
Rating in Universities that Count ESR index	-	67.1%

Next steps

- Further integrate sustainability into University strategies, plans and policies
- Implement initiatives to improve environmental and social responsibility performance

Information Services

Key achievements in 2009/10

- New PC supply contract specified low power demand equipment and moved from a 3 year to a 4 year replacement cycle
- New PC supply contract includes provision for return of packaging and computer recycling scheme
- PowerMan software purchased through Estate Office Salix funds and deployed on machines in IS controlled computer rooms – further roll out across the estate expected in March 2011
- Utilised best practice design to reduce energy demand through free cooling and thermal loss from Data Centre at King's Meadow
- Continued virtualisation of servers wherever appropriate, significantly reducing the number of separate machines, thereby reducing energy demands and maximising efficiency
- Actively encouraged a move away from single desktop printers towards MFDs with duplex set as default
- Recycled paper is used in all MFDs managed by IS, in libraries and computer rooms and IS staff offices
- Voice over IP used in new developments, thereby reducing the energy requirements of new buildings

PowerMan

The PowerMan energy management system was introduced in 2009 across 4,821 desktop PCs located within a number of student computer rooms across the University. Many of these rooms are accessible 24/7 and the computers within them vary in age.

This system means that computers are powered down after a defined period of inactivity, reducing their energy use.

It is estimated that existing PowerMan installations save around 714,000 kWh of electricity per year, which equates to £57,000 and 388 tonnes of carbon dioxide per year. Full deployment of the PowerMan system is anticipated for March 2011.

Additional work has been done to develop a WakeMan function to enable computers to be remotely 'woken up'; this will allow staff members that have a requirement to access their machines from home to do so, without needing to leave them switched on all the time just in case. This should minimise the need to opt out of PowerMan

Next steps

- Deployment of PowerMan and WakeMan across all staff PCs
- Development of an internal Print Strategy to minimise use of desktop printers and reduce print wastage
- Further work on the main data centres, including hot aisle containment and the installation of more intelligent power strips
- Continued server virtualisation

Landscape

Key achievements in 2009/10

- The University maintained its Green Flag award status and won its first Green Gown award for integrating sustainability into its grounds programmes. Green Gown is an award programme that recognises best environmental practice in the HE and FE sectors.

- Increased emphasis on sustainable plantings that require little or no maintenance, in particular drought resistant or prairie style plantings. These have been successfully used on Jubilee Campus adjacent to the Amenities Building and International House where gravel areas act as rainwater capture points to avoid excessive runoff.
- Purchased a new larger capacity trailer system that enables green waste to be transported more efficiently from University Park to the Grounds processing base. The new system reduces the number of journeys by 75%, offering similar reductions in transport-related carbon emissions.
- Jacobsen 'ride-on' triple mower was replaced in summer 2010 by a more robust rotary mowing system, thereby reducing breakdown time. The new equipment also doubles as a leaf collection machine and has proven to be three times faster in clearing leaves from amenity lawns than the previous system.
- Open day held as part of National Gardens Scheme Open Gardens raised £1,400 for charity

KPIs

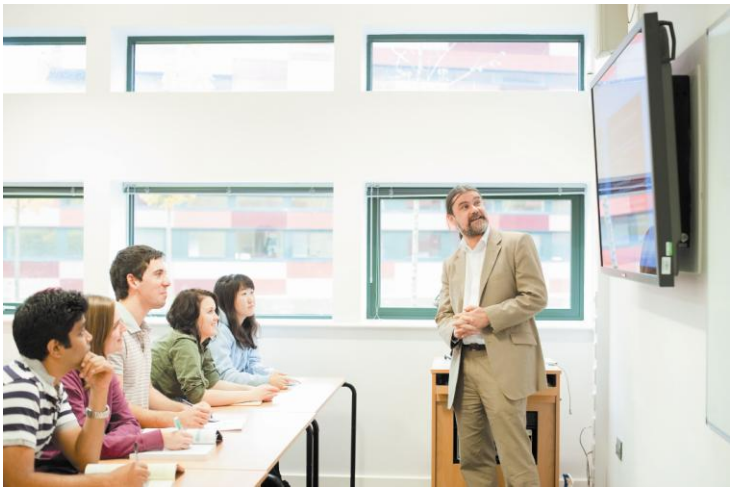
Indicator	2008/9	2009/10
Awards	2009 Green Flag Award 2009 Nottingham in Bloom Garden Competition, 'Best Business' Category - Gold Award for the University North Entrance Summer Bedding Plant Display	2010 Green Flag Award 2010 Nottingham in Bloom Garden Competition, 'Best Business' Category - Gold Award for the University North Entrance Summer Bedding Plant Display 2010 Green Gown award – received Highly Commended for 'Continuous Improvement in a specific area'
Numbers attending events	Picnic in the Park - 300 National Gardens Scheme Open Gardens - 500	Picnic in the Park – 500 National Gardens Scheme Open Gardens – 500
Recycling of garden waste	960 tonnes	960 tonnes

Next steps

- Seek funds to purchase an additional mowing unit to enabling even greater efficiency and to further reduce maintenance costs
- Reduce skip hire and emptying costs by 75% (from 2009/10 figure of £18,000) by ensuring that all waste is segregated appropriately by material types and recycled accordingly
- Increase student involvement in Friends of University Park group
- Develop biodiversity action plan

Teaching and learning

We want to contribute to having better educated, more socially and environmentally aware and responsible citizens around the world, who are prepared to face the global problems of society and make valuable contributions. Professional institutions require graduates to have sustainability knowledge. Increasingly businesses want graduates with skills to tackle sustainability issues such as climate change and social responsibility.



Key achievements in 2009/10

- The University Plan states we embed the principles of environmental responsibility and sustainability into our teaching courses. This is already in place in Schools including Business School, Environment and Engineering.
- Teaching and Learning Board has endorsed the establishment of a working group to take forward a programme to implement sustainability into our taught programmes. The group is chaired by Professor Sarah O'Hara and will have representatives from each Faculty. A work programme is being developed that will:
  - undertake an audit of current teaching related to sustainability
  - develop a programme for inclusion throughout University courses using review criteria in the course approval process
  - develop modules covering the subject, share best practice and develop cross-faculty resources/modules where appropriate
  - implement a plan for all Nottingham's graduates to have knowledge of sustainability

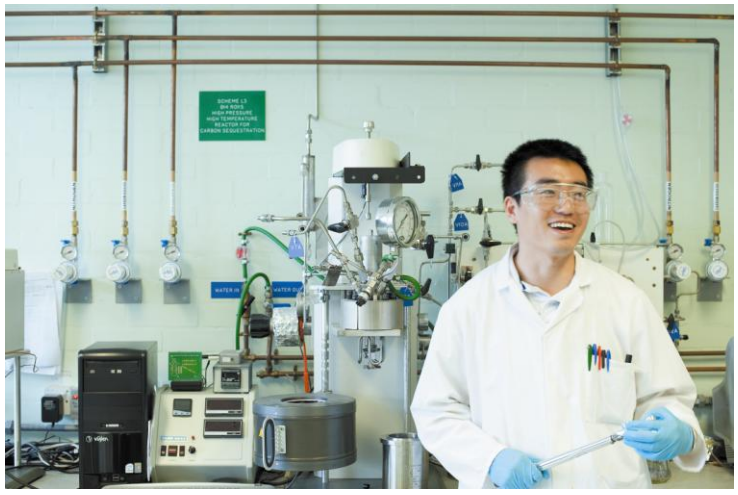
Next steps

- The Higher Education Academy, in association with the EAUC and NUS, is developing a pilot change programme, Green Academy: Curricula for Tomorrow. Nottingham is one of eight HEIs participating in this six-month programme to provide support in embedding sustainability in curricula in a holistic way throughout the University.

Research

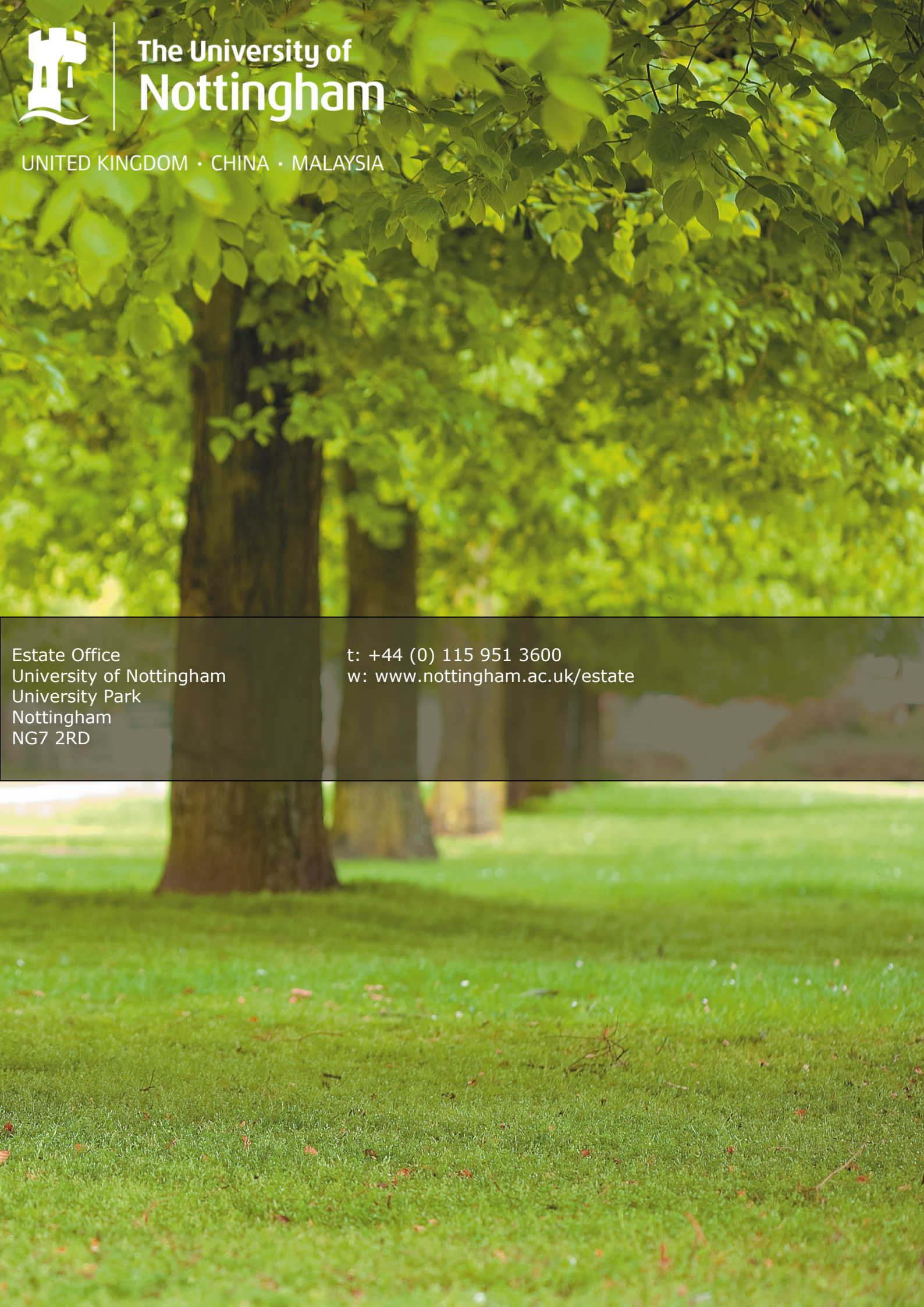
Key achievements in 2009/10

- The University has established a number of Research Priority Groups to grow and deliver an influential amount of world-class research and knowledge transfer addressing global issues and challenges. Priority Groups include: Energy; Global Food Security; Integrating Global Society; Science, Technology and Society.
- The University enjoys a world leading research programme across the following themes:
  - carbon abatement in clean fossil energy
  - energy vectors and storage
  - renewable energy
  - low-energy buildings
  - electrical grids
  - environment, policy and society



KPIs

Indicator	2008/9	2009/10
Research funding for environmental / energy / sustainability related research	-	£18.7m



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