

# KEELE UNIVERSITY Sustainability Report 2012



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**For information on environmental sustainability at Keele University please see:**

***[www.keele.ac.uk/greenkeele](http://www.keele.ac.uk/greenkeele)***

**Email: [keelehub@keele.ac.uk](mailto:keelehub@keele.ac.uk)**

**Telephone: 01782 733555**

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# FOREWORD BY THE CHANCELLOR

Jonathon Porritt  
Chancellor, Keele University

“Today’s students will be graduating into a pretty troubled world. Hardly a week seems to go by these days without some new research report on accelerating climate change or our destructive impact on the natural world. It’s troubled me for a very long time that this is the principal legacy we will be passing onto the next generation.

Which makes it all the more important for universities like ours to be preparing those young people in the best possible way, understanding the state of the world as it is, and taking on a sense of ownership for what they themselves can do to contribute to the solutions to these problems.

Keele University can be very proud of what it’s already done in that regard – indeed, I

feel very privileged to have been invited to become Keele’s Chancellor given its track record on many different sustainability issues. But 2012 has been special even by Keele’s standards, and the opening of the new Sustainability Hub (with around 1000 visitors a month!) is a massive achievement.

As you’ll see from this Report, there’s a lot going on at the moment! Sustainability is now critical to Keele’s future success, and very much part of ‘the promise’ that we make to all our students and to our neighbouring communities to work together for a more sustainable future.”



# INTRODUCTION BY THE VICE-CHANCELLOR

Professor Nick Foskett,  
Vice-Chancellor, Keele University

After the publication of our first annual Sustainability Report in the autumn of 2011, which was well received from all quarters, I am delighted to introduce the second of these reports. This publication covers all activity at the University over the last academic year 2011/12 in the area of sustainability. It is issued at the end of the first full year of activity of our new Sustainability Hub building, under the passionate leadership of Dr Sharon George, which has delivered an extensive range of activities and events to students, staff, visitors, local businesses, schools and members of the general public.

This year has also seen us make an explicit commitment to embedding sustainability in our new Distinctive Keele Curriculum for all students, and ensuring that sustainability features strongly within the student experience. In support of this, Dr Zoe Robinson has taken on the role of Director of Education for Sustainability, and her work in this area over several years earned her a prestigious National Teaching Fellowship in 2012. To complement the teaching, we have seen a range of major research projects, new or continuing, which either enhance our understanding of sustainable behaviours and their motivations, or will result in outcomes that could directly influence government policy or potentially affect future decisions taken by large corporations.

I am also pleased to note the increased level of student engagement with the environmental sustainability agenda, and as a result of this we now have student representation on the Environmental Sustainability Strategy Group which helps to inform the University’s future plans in this area.

Finally, I cannot round off the summary of 2011/12 without mentioning the installation of our new Chancellor, Jonathon Porritt. We are thrilled to have Jonathon to provide a guiding influence on shaping our commitment to environmental sustainability moving forward.

I am confident that 2012/13 will see many more achievements for us to report on our way to becoming one of the most environmentally sustainable universities in the UK.



A handwritten signature in black ink that reads "Nick Foskett". The signature is written in a cursive, slightly slanted style.

*Professor Nick Foskett,  
Vice-Chancellor, Keele University*

# KEELE'S ENVIRONMENTAL VISION



Professor Pat Bailey,  
Pro Vice-Chancellor (Environment & Sustainability)

One of the important features of our *environmental vision* is that we're addressing sustainability across all aspects of the life and work at Keele University, as can be seen by the key themes that are covered in this report. Within that context, we have tried to identify a small number of key projects in which we have made a significant step change each year.

One of the most significant 'step changes' in 2011/12 has been in our visibility and outreach through the Sustainability Hub, which was opened in October 2011, and has run and/or hosted hundreds of events during its first year in operation.

The other really significant area of development has been in the embedding of sustainability in the curriculum; whilst there is still much to do, it already forms a key feature of our new *Keele Distinctive Curriculum*. It is being led by Zoe Robinson, supported by 3 part-time project officers who will work with Schools across the University, whilst also carrying out PhD research on sustainability projects.

There have been many highlight events and new initiatives, so I can only mention a few to give a flavour of this report. *Green Week*, held in February 2012, saw a host of student-led activities, the premiere of Mark Edwards' astonishing photographic exhibition *Hard Rain: Whole Earth*, and the installation of Jonathon Porritt as our new Chancellor which culminated in an inspiring lecture by him at the end of the day.

One recurring feature of this last year has been the tremendous engagement by students, whether through running events during *Green Week*, setting up a Green Student House to showcase sustainable living, establishing the *Think:Green Society*, or the involvement of the Students' Union in taking forward the sustainability agenda.

Other especially notable things during 2011/12 include the establishing of the allotments (which quickly led to a *Student Eats* award which will allow

us to develop growing and providing of produce by/to students), a series of cycling initiatives to encourage more use of this mode of transport, and a range of commitments concerning procurement and catering.

The purpose of this report is not only to identify our successes, but also to point to ways in which we can improve. In the People & Planet *Green League Table* (GLT), we improved our 'score' by a substantial 5 points, but this still left us in 64th position [and a 2(i) classification]. One reason for this modest performance is the size of our estate and the relatively small size of us as an HEI, which penalise us in the metrics; nevertheless, we aim to improve to a 1st class institution over the next 2-3 years, and many of the improvements introduced over the past 2 years will only now start to seriously impact on some of the GLT criteria.

In terms of awards, 2011/12 also saw a number of successes. We were shortlisted for a Green Gown Award in the sustainable education category, and came runners up in the Lord Stafford Awards for the vertical axis wind turbine technology (go and see the prototype operating at the Hub) which is being developed by the company McCamley. We were the only university in the top category of the government's Carbon Reduction Commitment league table, and Zoe Robinson was awarded a National Teaching Fellowship for her educational innovations in the area of sustainability over several years.

This report provides the springboard for our activities in 2012/13; as it is being completed, plans for *Green Week* are being put in place, the Sustainability Hub has won a number of grants to increase outreach and public engagement, and the date for a sustainability conference is being finalised. I hope this report inspires you as it summarises our achievements during 2011/12, and provides cameos of specific projects, and I'm confident that the next 12 months will be equally productive.

# STUDENT ENGAGEMENT

Written by Luke Bellamy & Carl Brindley

## Green Week

Student participation in environmental issues has increased over the last year and Green Week attracted a large volume of new students, many of whom had rarely, or never, engaged with environment-related activities within the University before. Green Week acted as a catalyst to enable these students to get involved with sustainability. There is now a high level of enthusiasm amongst students about supporting sustainability initiatives and bringing the green message to the University. Staff and students worked together to plan a week of activities, ranging from art installations to a green themed “night out” at one of the campus bars.

## Think:Green

The Think:Green Society was born out of Green Week and the Keele Environmental Group (founded by Scott Reid & Sam Green in 2009) and this year reached over 120 members. The students involved with the Think: Green Society are currently producing a feasibility proposal for expanding food-growing facilities across campus. This is being led by students from a variety of subject areas, and is a truly interdisciplinary attempt at applying their knowledge to understand the problems of food production and supply on campus, whilst thinking of practical sustainable solutions.

The Think:Green Society has now become a Student Led Service (SLS) within the Students’ Union. The students in Think:Green elected for this change to happen, so that the Society could become more embedded within the student body politic, whilst gaining improved access to funding, and to increase engagement with all students regarding matters of sustainability.

## Sustainable Student Living

The Sustainable Student Bungalow (SSB) is a unique project that started in September 2011. It has created a platform for students to get involved in growing their own food, and embracing

the culture of living more sustainably. The SSB has created a strong social platform, and last year saw a large number of people willing to help out with the shaping of the project inside the house and in the garden. Those successes continue this year as students learn through the activity of managing a sustainable home. There is a strong possibility that applications for the opportunity to live in the project this year will be competitive.

Engagement was not just limited to students who got involved with the bungalow project, but also involved staff from a variety of sections across the University including Estates, academic departments and Accommodation Services, who all worked together on various aspects of the project, demonstrating what can happen when people come together to make sustainability work.

A veritable A-Z of vegetables was produced throughout the year and fed facilities staff, professors and even the Vice-Chancellor! Oh and, of course, the students!




## MIXED RECYCLING AT KEELE

Please empty all contents before recycling - RECYCLING MUST BE IN CLEAR BIN LINERS (NO BLACK BAGS ALLOWED)

Cardboard		
Paper and Magazines		
Plastics (grades 1 to 4 only, e.g. bottles, cling film, food wrappers)		
Cans and Foils		

**DO NOT INCLUDE GLASS, POLYSTYRENE, FOODS, LIQUIDS ETC.**  
Glass waste recycling points are planned



# UNIVERSITY CARBON MANAGEMENT PLAN

The University is committed to reducing its carbon footprint and has launched, in partnership with the Carbon Trust, a Carbon Management Plan (CMP) that aims to reduce carbon emissions by 34% by 2020 based on 2008/09 figures. As part of the CMP we aim to further improve energy efficiency across campus, reduce waste and increase recycling rates.

We have launched an environmental awareness campaign amongst staff and students, with the aim of reducing energy wastage and encouraging improved environmental behaviour in other areas such as waste and travel.

The reduction in carbon emissions is fixed, regardless of business growth. This presents the University with some challenges given the following:

- Student numbers have increased by nearly 10.5% from 2008/2009
- There has been an increase in Estate size building area 141,000m<sup>2</sup> (2001) to 153,000m<sup>2</sup> (2012) = 8%
- There are now longer opening or operational hours in some buildings, especially the Library & catering outlets
- This target doesn't take into account an increased level of utility consumption as a result of the construction of new buildings by external contractors who use our utilities, especially electricity & water to facilitate the project work (e.g. Union Square, Students' Union, the new Day Nursery).

We continue to publish all our utilities data on the University's website, and this can be easily accessed by visiting [www.keele.ac.uk/greenkeele](http://www.keele.ac.uk/greenkeele)

## Award recognition

April 2012 has also seen the first year of the performance league tables for the Carbon Reduction Commitment and Keele is proud to have achieved joint 1st position and to have been the only academic institution to do this.

## Carbon emissions against target

Over the last year Keele University has reduced its carbon emissions by 3.20% against a target of 3.37%.



## Increased investment in our infrastructure

The University has been fortunate to secure some external funding from HEFCE as part of their SALIX/HEFCE "Revolving Green Fund" which is used to support the implementation of energy saving projects that will achieve financial pay-back within a five year period, with the estimated savings put back into the fund to be reused. The Salix financial year runs from 1st April to 31st March, so these figures refer to that period. The University's performance in utilising the fund has gained recognition from Salix for the second year running. This measurement is based on a number of factors which show how efficiently the available funds have been spent and how efficient are the rewards i.e. payback & energy/carbon savings.

*'Salix would therefore like to congratulate you and your team for the second year running on the strong performance of your fund and at the end of 2011/12. We would confirm that out of seven delivery measures, Keele University is placed in the top five on two occasions; and have come third on spend rate and fourth on spend vs. fund size.'*



### **Carbon Reduction Commitment (CRC) report**

The University is a participant in the Carbon Reduction Commitment (CRC) scheme based on the mandatory ruling on the amount of electricity and gas it consumes annually. This scheme was initially designed as a carbon credits trading scheme where participants were obliged to purchase allowances based on the annual consumption of gas & electricity. The scheme was designed to encourage energy efficiency and reduction whereby they would be financially rewarded based on the position they were in a league table. There are two early action metrics: mandatory Automated Meter Reading (AMR) on all fiscal (primary) meters, and a recognised energy efficiency accreditation such as the Carbon Trust Standard. The University has had AMR on all the primary meters for a number of years (2008) and also has achieved the Carbon Trust Standard. (The Carbon Trust Standard existed previously as the Energy Efficiency Accreditation Scheme-EEAS, which the University gained initially 2003 then reaccredited in 2006 & 2008 when they were invited to participate in the newly formed Carbon Trust Standard). It was decided in 2011 to pursue re-accreditation, which would satisfy all the early action metrics of the CRC rules. The University was successful in September 2011 in achieving the standard with good assessment marks (90% in all categories). Because of its complexity, the scheme is currently under review, so Keele may not receive the financial rewards that

were originally intended for the scheme. However, it places us in a strong position concerning current and future monitoring of our CO<sub>2</sub> emissions, and has provided the following reduction and savings in 2011/12:

#### **Data & results**

**Baseline 2011 figure - 12,663 tCO<sub>2</sub>**  
**Financial Cost @£12 per tCO<sub>2</sub> = £151,956**

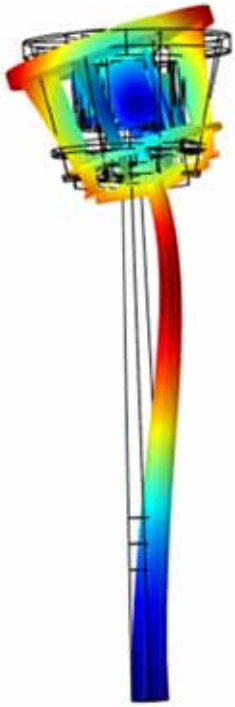
**Submitted 2012 figure - 12,086 tCO<sub>2</sub>**  
**Financial Cost @£12 per tCO<sub>2</sub> = £145,032**

**Reduction in CO<sub>2</sub> - 577 tCO<sub>2</sub>**

**Financial saving = £6,927**



# RENEWABLE AND LOW CARBON ENERGY



*Structural vibrations of the McCamley turbine (highly exaggerated!)*

The economic plight of the Eurozone countries, and to a lesser extent the UK, has made the government and many companies take their eye off the ball with regard to environmental issues; but the fact that in many places across the globe CO<sub>2</sub> values have already reached 400 ppm and are increasing at almost 2 ppm per year means that we are only a quarter of a century away from the 450 ppm tipping point which is critical for keeping temperature rises at an almost acceptable 2 degree centigrade rise. We continue to make progress on campus energy, although perhaps at a more staid pace than we might have hoped.

## Wind Energy

Wind energy research has been a source of both funding and initiatives at Keele - with the Applied and Environmental Geophysics Group being selected to carry out research for the National Grid on offshore wind turbines. In addition, a new vertical axis turbine was installed at the Sustainability Hub with McCamley Ltd. An MSc project on modelling and measurement of this new design, which can start in very low winds and be deployed on buildings, was carried out by Megan Turpie - a student on the MSc Environmental Sustainability and Green Technology programme. Using a modelling software package, Megan modelled the vibration characteristics of the turbine and the tower on which it was installed and, together with Dr Rachel Westwood and Sam Toon, carried out a validation measurement programme. This was shortlisted as one of the projects for this year's Lord Stafford Awards and was runner-up in its category.

Other notable projects this year included Alistair McClaren's analysis of performance and particularly infra-red modelling of the Hub Building and its comparison to the Apedale Sustainable Visitors' Centre, and some interesting results have emerged for both buildings. In particular, it has emphasised the challenges posed by renovation of old buildings to the highest sustainability and low carbon standards, especially when they are as multi-functional as the Hub Building. However, the high occupancy of the Hub Building is very pleasing.

## Solar/Photo Voltaic Energy

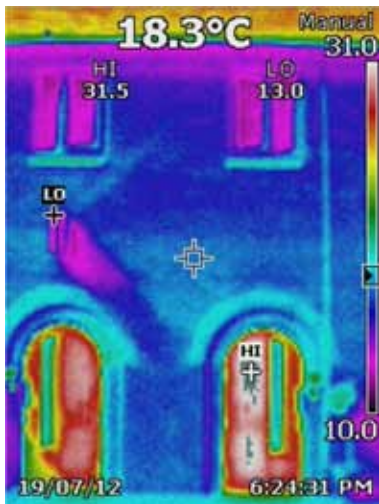
A project carried out last year by an MSc student which we reported in last year's Sustainability Report, on campus solar energy, in parallel with work by Estates, has led to a significant deployment of solar PV on the new Nursery building and it is hoped that more solar energy can be rolled out over the rest of campus in the coming year.

## Coal Bed Methane

Various energy issues including shale gas and its associated seismicity have brought unconventional hydrocarbons, including coal bed methane, into the public eye in perhaps not quite the way which was planned. Discussions are underway with IGas as to how the Coal Bed Methane (CBM) project can move forward from a pilot scheme to be a real contributor to Keele's energy budget.

## Geothermal

Despite winning a large grant from the Department for Energy and Climate Change's Geothermal Fund (£500,000) the short timescale in which to deliver this project (three months) meant that it was not feasible for the University to initiate geothermal drilling. However, this has generated a great deal of interest in Keele's work from a number of geothermal companies, inspired by the Keele concept both on the campus itself, for generating energy for Stoke City from Minewater Geothermal extraction, and also for geothermal energy from the younger Permo-Triassic Rocks of the Cheshire basin with GTenergy in Manchester City Centre; and we hope to be able to take some of these forward on a more realistic timescale.



*Infra-red thermal Image of part of the Sustainability Hub. Bright values indicate heat loss*



*The McCamley vertical axis turbine on Keele Campus at the Sustainability Hub.*



# ESTATES DEVELOPMENTS

## Student Eats

Keele University has been selected as one of eighteen institutions to take part in the **Student Eats** project. This new scheme, funded by "Local Food" and the "Big Lottery Fund", will create a network of new local food growing sites on eighteen English university and college campuses. At Keele University the funding is being used to develop our allotment site to provide additional space for a student society to grow their own food. **Student Eats** will also support existing food growing at the "Sustainable Student Bungalow" on campus - an exemplar of sustainable student living.

As part of the project, Keele University will have a polytunnel installed and an existing glasshouse utilised to extend the growing season. Produce grown by the students will be sold to students on campus from a food co-operative.

We hope over the next year many more students will gain valuable skills and knowledge on how to grow their own food.

## Cycle to work scheme

Keele University launched the staff cycle to work scheme in March 2012, which allows eligible employees the tax-free hire of bicycles and related safety and security equipment. The scheme operates through a Government initiative aimed at getting more people to cycle to work. Since its launch 19 University employees have taken advantage of the scheme.

Over the last year eleven new bicycle storage areas have been installed across campus, in consultation with the Bicycle Users' Group. Plans are also in place for the University to partner with a bicycle supplier to provide students with low cost, practical and accessible bicycles.



# WASTE AND RECYCLING



Since the introduction of a new waste recycling contract in November 2010 (at which time we had 0% recycling!) Keele University has increased recycling rates to 44% for the 2011/12 academic year. This includes the recycling of dry mixed recyclables (paper, cardboard, plastics, and cans), glass and food waste from all central services and academic buildings on campus and from Halls of Residence.

Other waste is generated on campus from other activities, the most significant of which is green waste at over 500 tonnes per annum. Although this waste is composted, it (bizarrely) counts against us in the Green League Table.

### Awareness Raising

In order to raise awareness and monitor progress the University has arranged for the waste contractor to provide monthly waste and recycling consumption data based on actual weight of waste and recycling collected. Utilising this data, a university-wide league table of recycling performance (%) is published on a monthly basis to raise awareness and encourage improved recycling performance.

Students are incentivised to recycle within Halls of Residence by regular

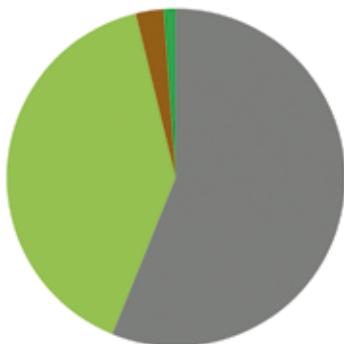
updates on their Hall's recycling performance and an inter-halls' recycling competition. The winning Halls of Residence receive money to be spent on the Halls of Residence social space.

Providing easy-to-use, conveniently located recycling facilities is paramount to achieve high recycling rates. It is also important that recycling points and awareness materials are clearly labelled. Therefore, the University has adopted the use of the national wrap artwork which is easily identifiable and conveys a consistent format for awareness-raising material. Many students and staff are familiar with the wrap iconography as it is widely used by local authorities on recycling published material.

### Future Developments

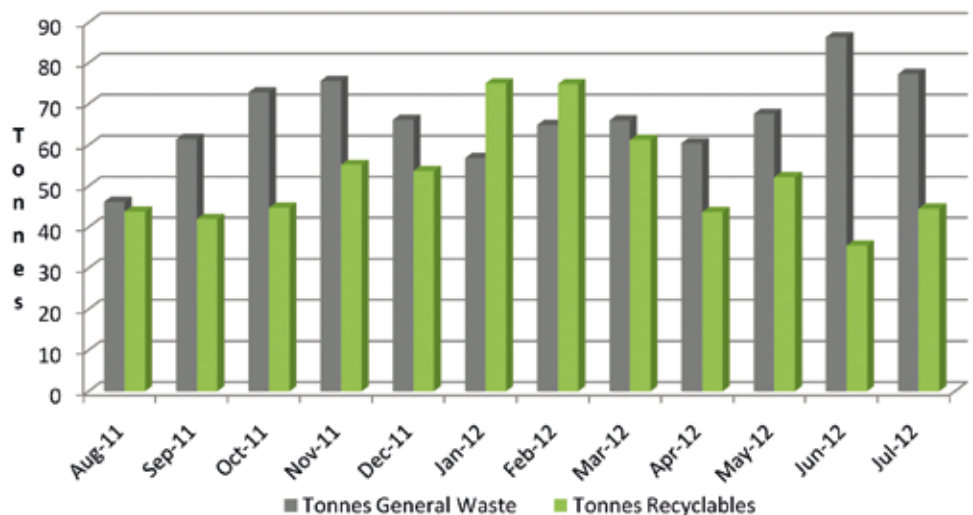
A target has been set to achieve a 60% recycling rate by 2014/15. We hope this will be achieved by increasing the provision for internal recycling and also putting in place further recycling collection points throughout the campus.

## Total Waste 2011/12



## Total Waste and Recycling Consumption (Tonnes)

August 2011 - July 2012



# SUSTAINABLE PROCUREMENT AND CATERING

## Key developments

'Keele's catering outlets are striving to reduce the negative impact on the environment and people's lives of the food that we serve. For example:

- We aim to provide menus that are seasonal with locally sourced food where appropriate to reduce the carbon footprint.
- Only free-range eggs, sourced locally, are purchased and sold in our catering outlets and used in our conference menus.
- We were awarded Fairtrade status in February 2008 and sell a range of products including cakes and orange juice. We also use Fairtrade sugar, hot chocolate and tea.
- Our coffee is Triple-certified: Fairtrade, Organic and Rainforest Alliance.
- We segregate our food waste from our kitchens which is used to generate green energy from an anaerobic digester by our waste contractor in Cannock, Staffordshire.

- Our kitchens recycle plastic, cardboard, paper and glass.
- Waste oil is collected and used for bio-fuel.
- We have replaced all polystyrene takeaway boxes with biodegradable products.

## Future Developments

The purchase of bottled water has a considerable environmental impact, when compared to tap water. This includes the carbon emissions associated with the transport and production of the bottles. Over the next year we aim to promote tap water as a sustainable alternative to bottled water. This will be done through clearly indicating where safe drinkable tap water is available on campus, and adding refilling stations in key areas.





# SUSTAINABILITY IN THE CURRICULUM AND STUDENT EXPERIENCE

## Our approach to embedding sustainability in the curriculum

Keele is committed to embedding sustainability into all of its educational programmes, to offering co-curricular sustainability opportunities for all students, and to developing a culture of sustainability within the University. The strategies for embedding sustainability education into the curriculum and culture of the University were supported by Keele's participation, alongside seven other institutions, in the Higher Education Academy's pilot 'Green Academy' change programme in 2010/11.

The commitment to embed sustainability into the curriculum is reflected in high level policy, for example the University Environmental Policy lists 'Greening the Curriculum' as its first goal. Sustainability is embedded within the University's Graduate Attribute statements, and sustainability is one of three key themes running through the new Distinctive Keele Curriculum (DKC), ensuring that all programmes explore ways of embedding sustainability in their courses. This activity and commitment from the university mirrors student demand for sustainability coverage in the curriculum, as evidenced by a recent survey of Keele undergraduates.

Under the environment/sustainability theme, we have about 200 undergraduates studying a variety of programmes, and a similar number of postgraduates. All of these courses (UG and PG) have a project component, often in collaboration with industry, and many of these will be directly aligned with activities in the Keele University Sustainability Hub, thereby enhancing its materials, resources and outreach capability. At the doctoral level, members of academic staff run a prestigious two week summer school on environmental politics and policy for twenty international PhD students,

funded by the European Consortium for Political Research.

Embedding sustainability in the curriculum is one approach for integrating sustainability holistically into the University's core activities and its culture, and there is already significant provision of sustainability education. Putting sustainability at the heart of the curriculum and student experience at Keele continues to follow a multi-strand approach covering the following areas:

- **Staff development:** through Education for Sustainable Development (ESD) workshops tailored for different disciplines and for new lecturers
- **Integration into undergraduate and postgraduate taught programmes:** as part of the Distinctive Keele Curriculum, which sees Sustainability as one of three strands alongside Internationalisation and Employability running throughout students' curriculum and co-curriculum experiences
- **Discrete undergraduate sustainability modules,** such as the 'Greening Business' elective available to all 1st year undergraduate students, giving students the skills and motivation to drive positive sustainability change in organisations
- **Integration into PGR training**
- **Specific sustainability-related programmes,** such as the BSc in Environmental Sustainability, MSc in Environmental Sustainability and Green Technology, MAs in Climate Change Studies and Environmental Politics, and a new programme in 2012/13, a BA in Environmental Studies
- **Co-curriculum developments** for students to become involved in sustainability projects, through volunteering, campus-based sustainability developments, research projects, and student-led projects such as the Sustainable Student Bungalow project (see page 21).



- **Continuing Professional Development activities**, building on the success of Project Green, Keele Connect and Destination Green, using our sustainability expertise to expand sustainability education beyond the boundaries of the University campus, to business and local communities.
- **Teacher education** through integration into PGCE programmes, and exploring the meaning of ESD for trainee teachers' own subject specialisms, for example considerations of 'green ICT' in ICT, to the renewable nature of building materials in the Tudor period in history.

## **New Education for Sustainability developments in 2011/12**

2011/12 has seen Keele developing its reputation in provision of sustainability within the curriculum and student experience. Below are some of the highlights of 2011/12.

### **Appointment of first Director of Education for Sustainability and Sustainability Project Officers**

The University appointed its first Director of Education for Sustainability in 2012, showing a genuine commitment to embedding sustainability into the curriculum and student experience. To work alongside this role three new Sustainability Project Officers have been appointed who will help support curriculum developments, staff development, and work with students to support student-led projects and coordinate co-curriculum sustainability opportunities.

### **Sustainability and staff development**

Throughout 2011/12 a number of new staff development activities around sustainability have been held. This includes a workshop on Education for Sustainability delivered for all new academic staff as part of the Teaching and Learning in Higher Education Programme, and discipline-tailored

workshops delivered to key members of programme teaching teams. This is in addition to an existing workshop on wider sustainability issues at Keele carried out as part of the programme of workshops available to all university staff and delivered within the Keele Knowledge Programme.

### **New discipline-specific sustainability modules**

Some disciplines which may not traditionally be associated with sustainability, have started to integrate sustainability into their teaching programmes. For example, the School of Pharmacy ran a module called 'Sustainable Pharmacy' as a third year option module as part of the MPharm degree for the first time in 2011/12, and will be further embedding sustainability into core teaching for a wider number of pharmacy students in 2012/13. 2012/13 also sees the start of a new History module entitled 'Nature, Society and the Past: An Environmental History of the Western World 1800-2000'.

### **Engaging students through consultation**

2011/2012 saw the first of what are to be regular sustainability consultation events. During Green Week in February 2012 a Sustainability Forum was held for staff and students, providing a forum to discuss ideas for sustainability improvements in the overall student experience, and for students to feed these directly to those with responsibilities for environmental and sustainability activity at Keele.

### **'Think:Green': New student sustainability society**

A new sustainability-focussed student society was established by students in 2012. This society developed from the free elective module 'Green Business' which had a powerful effect in catalysing student activism and motivation to drive forward their own projects.



# SUSTAINABILITY IN THE CURRICULUM AND STUDENT EXPERIENCE (CONTINUED)

## National sustainability course recognition

The BSc in Environment and Sustainability course was shortlisted for a Green Gown award in the 'Courses' category. The application focuses on the transformative impact of the course on students undertaking it, and the impact it has in producing genuine 'change agents' motivated and capable of driving positive sustainability improvements and becoming future sustainability leaders.

## National Teaching Fellowship for Education for Sustainable Development work

Dr Zoe Robinson, the new Director of Education for Sustainability has been awarded a prestigious higher Education Academy National Teaching Fellowship, largely for her work in the field of Education for Sustainable Development, both supporting activity at an institutional level and for a number of national level projects in this area.

## Destination Green

Following on from the highly successful and award winning projects, Project Green and Keele Connect, 2011/12 has seen a continuation of this scheme, with Destination Green, where 19 un- or under-employed graduates have been placed with over 16 large companies, including Rolls Royce, Churchill China, Seddon Property Services, Carillion and

Veolia. The graduates have completed placement projects on such diverse sustainability-related projects as helping a renewable energy company with their rebranding and marketing, to helping a wildlife trust develop their evaluation tools for their environmental education programmes, to improving environmental management systems. The graduates also develop their awareness of issues around sustainability in organisations by completing two 15-credit M-level masters including one on 'Greening Business: Carbon and Environmental Management.'

## Climate Change leadership

A collaborative project is underway to develop a module entitled 'Strategic Leadership for Sustainability and Climate Change', funded by the European Social Fund. The project brings together the expertise from four different universities in the West Midlands: the University of Wolverhampton, Birmingham City University, Aston University and Keele University. The project aims to provide a masters level module that can be undertaken as part of an employee's CPD, that will provide support for individuals with environmental and sustainability responsibilities within their organisation

For further information on sustainability curriculum developments and projects at Keele contact **Dr. Zoe Robinson**, [z.p.robinson@keele.ac.uk](mailto:z.p.robinson@keele.ac.uk)





# OUTREACH

Over the last year we've been fortunate to have an amazing outreach facility in our new Sustainability Hub building. Activities inviting the general public have been key to the success of the Hub since its opening. Events are usually free and aim to invite people to engage with the University facilities, services and programmes. A range of workshops and seminars have been made available to the public in areas of sustainability from "beekeeping for beginners" to "water conservation in developing countries". In December 2011 the Green Christmas Fayre attracted hundreds of visitors. Day events such as "Dig it!" have been held for both the old and the young to come and explore the joys of gardening and composting, with the aim of fostering inter-generational knowledge exchange; and the first "Family Fun Days" were launched during the summer school holidays for families to engage with concepts of sustainability and science through fun activities.

The Sustainability Hub provides a portal for schools to access a range of expertise and facilities from the University. In November 2011 more than 40 pupils from Sandon Business and Enterprise College, St. Josephs College, Haywood Engineering College and St. Thomas More Catholic College took part in a "Really Rubbish" day. Children focused on issues of recycling, re-use, waste and litter and their impact on the environment during fun activities as they made Really Rubbish music, jellyfish, a world map and even a Dalek. The children planned lessons, assemblies and projects to take back to their own schools.

As well as events delivered at the Sustainability Hub, the continuing work of the Science for Sustainability team (established in 2006) takes the message of sustainability out to local schools and offers events at a variety of venues. Science for Sustainability (SfS) delivers interactive and innovative workshops to schoolchildren of any age from reception to A-level classes, covering many aspects of sustainability from renewable energy and waste to climate change and life cycle analysis.

Bespoke workshops are developed for each audience and tailored to meet the needs of the national curriculum. SfS also runs workshops specifically for schoolteachers to help them build the confidence to tackle sustainability issues in their own classrooms, and participates in public events, bringing issues of sustainability to the wider public.

Between September 2011 and 2012 workshops have been delivered by SfS to a total of 1760 school children from the ages of 5 to 16. In both 2011 and 2012 SfS was part of the 'science tent' at the music festival 'Bestival' on the Isle of Wight which has an attendance of over 50,000. The team offered hands-on experiments and interactive displays in the science tent which directly reached over 3000 members of the public on each visit. SfS also participated in a number of other large public events including the 'How Science Works' days at the Potteries Museum in Stoke-on-Trent, and attended the British Science Festival (Aberdeen) in September 2012, as well as some smaller events in conjunction with East Staffordshire Borough Council and Staffordshire County Council.

*"Classes in the Sustainability Hub were inspiring and educational, as the building is an example in itself of green living"*



# RESEARCH



*Dr. Sami Ullah, part of a team investigating the impact of landscape position and land use type on soil denitrification rates in the Ribble and Conwy River watersheds.*

In 2011/12 Keele has continued to strengthen its reputation as a research-led University with several large grant successes, including some linked to the environmental sustainability agenda. One of Keele's strengths in environmental research is the inter-disciplinarity of its research. Research in E&S includes academic staff from many Schools and disciplines, including: environmental science, geology, physical and human geography, life sciences, chemistry, mathematics, computer science, psychology, politics, international relations, public policy, education, sociology, English, economics, and business and management. In 2011/12 we had 39 research students in the environmental sustainability area.

In the 2011 Sustainability Report we covered Keele University's success in securing a large inter-disciplinary project entitled 'Reducing Energy Consumption through Knowledge Networks' (RECKN). This is one of seven inter-disciplinary projects funded by the ESRC and EPSRC under their Energy and Communities collaborative venture. It is worth £0.5M and is running from 2011 to 2013. The project is examining the impact of social demographics on the level of community engagement in 'green' behaviours, such as recycling or using low-energy light bulbs. The project team is looking, in particular, at how information about energy is shared between people and organisations and is comparing two communities with different socio-economic profiles (Newcastle-under-Lyme and Shrewsbury respectively). The project team expects the differences between the two communities to generate a range of contrasting insights for understanding how energy-relevant knowledge circulates within different communities. By investigating these 'knowledge networks' the team is moving away from the idea that information provision in a top-down direction is what is needed to make people 'change their behaviour', with the recognition that if new knowledge about energy use is to be injected into people's lives it will have to be done using existing networks

that they trust and are grounded in their own contexts. This information will be extremely informative in highlighting the best ways to increase environmentally sustainable behaviours amongst populations. Sixty household interviews and a number of focus groups have now been conducted and data collection is virtually complete. The project team is now working on analysing and disseminating the data. This will include a professional AV production aimed at communities and the policy community.. The findings will be valuable across a range of energy policy contexts, including fuel poverty and the coalition Government's Green Deal.

In addition, there are two other large consortium research projects underway at Keele with links to the environmental sustainability agenda.

Dr Sami Ullah is part of a successful consortium grant titled "Analysis and simulation of long-term/large-scale interactions of C, N and P in UK land, freshwater and atmosphere". This consortium project, worth £2.5 million, is a joint project of eight national institutes including Keele, NERC's Centre for Ecology and Hydrology, Lancaster, British Geological Survey, Liverpool University, University of Lancaster, University College London, Rothamsted Research and the James Hutton Institute.

Out of the total £2.5 million grant from NERC, £270k is directly awarded to Keele to investigate the impact of landscape position and land use type on soil denitrification rates (sequential reduction of mineral nitrogen to  $N_2O$  and  $N_2$  gases) in the Ribble and Conwy River watersheds in the UK.

In a global change and food security context, mineral nitrogen as a fertilizer and as a water and air pollutant has significant ecological and socio-economic implications. Therefore, knowing the extent of denitrification in soils is of critical importance in informing us how best to cope with the emerging nitrogen pollution issues of our water and air resources and to optimize





efficient use of nitrogen fertilizers.

Dr Maria Heckl (Mathematics) is leading a European consortium grant entitled 'TANGO' which is looking at how to address combustion instabilities in devices such as gas turbine engines and domestic burners.

In recent years, the development of clean combustion systems with the resulting reduced pollution of the environment has become a priority; however, such systems are particularly prone to combustion instabilities. There is an urgent need to understand the physical processes that are responsible so that methods to predict and prevent these instabilities can be developed.

The research in TANGO is intended to address these issues. Fundamental studies will give physical insight into the three-way coupling between sound, combustion and vortices in a combustion chamber. On the applied side, TANGO will develop active and passive control methods to allow safe operation of gas turbines on a variety of fuels and operating conditions.

TANGO is a multi-disciplinary project that provides training for 13 early-stage researchers and one experienced researcher in fluid mechanics, thermodynamics, mechanical and control engineering, all from an analytical, numerical and experimental perspective. The consortium has been chosen so as to bring together complementary skills from internationally renowned experts from both academia and industry. The "icing on the cake" of this large engineering project is the number of female scientists involved: 5 out of the 9 scientists in charge are women. It is expected that this will act as a magnet for young women who are considering a career in science or engineering. The network thus addresses the EU policy of increasing the number of female researchers in Europe. In order to promote the public understanding of science, the researchers will engage in various outreach activities.

Other areas where our research strengths and expertise in E&S are really important are in our research-related enterprise activities and interactions with business and in our outreach and public engagement activities, in both of which we have a nationally leading reputation and have won significant external recognition and awards. More detail on this is covered in the following sections.



*"One of Keele's strengths in environmental research is the inter-disciplinarity of its research."*





# ENTERPRISE

## CONTRACT RESEARCH & CONSULTANCY

### **Keele works with National Grid to research the effects of offshore wind farms on carbon capture & storage reservoirs**

The UK emits approximately 650 million tonnes of carbon dioxide each year and the Government has pledged to cut emissions by 80% from 1990s levels by 2050. One of the key technologies identified to help deliver this challenging target is Carbon Capture and Storage (CCS). A large proportion of the CO<sub>2</sub> produced comes from the burning of fossil fuels to generate electricity. The idea behind CCS is to capture the CO<sub>2</sub> emissions and store them in a safe environment, thereby reducing the amount of CO<sub>2</sub> released into the environment. There are three processes behind CCS, all of which are technically challenging and demanding:

- the CO<sub>2</sub> must be captured during the industrial process
- the CO<sub>2</sub> must be transported from the site of capture
- it must be permanently stored in subsurface strata

All three of these facets are technically challenging and demanding, but particularly challenging is the safe, long term storage. The CO<sub>2</sub> is “sequestered” in reservoir rocks under the North Sea and the monitoring of these reservoirs using sophisticated time lapse 3D seismic monitoring is vitally important in CO<sub>2</sub> storage reservoir management and post-injection assessment. However, the North Sea is also a preferred location for large scale offshore

wind farm development and wind turbine generated noise may interfere with seismic signal acquisition and processing.

The Applied & Environmental Geophysics Research Group (A&EG) at Keele, led by Professor Peter Styles, with assistance from the University of Edinburgh, is working with National Grid Carbon Ltd (NGC), a subsidiary of National Grid set up to develop CO<sub>2</sub> transportation and storage infrastructure in the UK, to investigate whether the vibrations caused by off-shore wind farms located near prospective reservoir sites might impact on seismic data acquisition for CO<sub>2</sub> storage reservoir monitoring.

Previous work by A&EG at Keele has been able to characterise the effects of land based wind turbines on the seismic monitoring station at Eskdalemuir (part of the UK’s commitment to the Comprehensive Test Ban Treaty Organisation) and to develop algorithms which allow the Ministry of Defence to predict the effects of new wind farms and set thresholds within which permitted development can take place, and this has led to over 1.5 GW of wind generating capacity with a value to Scotland of over £1.5 billion being released for development in the southern uplands of Scotland.

Offshore wind is a key strand of the Government energy policy and it is anticipated that it will provide 17% of the UK’s energy needs by 2020. Clearly, it is in everyone’s best interests that offshore wind and CCS are able co-exist together in the harsh but energy-rich environment of the North Sea.



Photograph courtesy of [www.FranceHouseHunt.com](http://www.FranceHouseHunt.com), supplied under a Creative Commons Attribution 2.0 Generic Licence.

## SUSTAINABILITY INTERNSHIPS

Keele has a track record of providing successful internship schemes focussed in the areas of the environment and sustainability. Previous schemes, starting in 2009 with “Project Green” and continuing with “Project FIT” and “Keele Connect”, have been very successful in placing graduate interns in local and regional SMEs. Over 225 graduates were placed into an environmental project or environmental company, out of a total of 330.

Launched in February 2012, “Destination Green” is an internship scheme aimed at providing graduates with the much needed experience they need, whilst helping organisations with their sustainability agenda.

19 graduates were placed into internships between March and August 2012, all with an environmental focus. Internships lasted 14 weeks at a cost of £100 a week to the organisation. In return, they were provided with a graduate to work at their premises on a full-time basis, 2 visits from a Keele academic to help them scope their project out and attendance at a workshop at the University. Graduates received a bursary of £250 a week and were enrolled onto 2 post-graduate modules, “Greening Business” and a placement module, fully paid for by Keele.

In total, the Destination Green team worked with 16 organisations, 5 of which had never engaged with Keele previously: Rolls Royce, Churchill China, Seddon Property Services, Carillion and Veolia.

Project examples included:

- Updated Carbon Audit and Development of Carbon Reduction Strategy
- Office Waste Management
- Carbon Project
- BREEAM-In-Use implementation in VES waste treatment facilities
- Clay and Glaze Reclamation Project
- Elimination or best possible alternative for packaging waste

Currently, we know of three graduates who have been taken on by their organisations.



# KEELE UNIVERSITY SUSTAINABILITY HUB

**Joan Walley, MP for Stoke North, during the keynote lecture at an inaugural symposium at the Hub, entitled “Collaborations in Sustainability”, said it was absolutely essential for universities to be at the heart of the environmental agenda and described the Hub as a really important facility for North Staffordshire**

## **A catalyst for collaboration**

Keele University Sustainability Hub is situated in a prominent position near the main entrance of the campus. It is comprised of an energy demonstration room, a 90 seat lecture theatre, a computer laboratory, teaching rooms and a unique Earth Observatory that is home to laboratory and teaching equipment for science outreach. The building opened its doors for business in October 2011 and hosts a range of teaching and training, events and meetings and research activities. The facility has not only provided an inspirational meeting point for groups from the campus residential, academic and student communities but has helped attract local and national groups and organisations to the campus enabling engagement, attracting new students and igniting new collaborations. In its first year the Hub attracted around 1,000 unique visitors a month. We also received £140K from the Wolfson Foundation, after which the lecture theatre will be named.

## **A History of Innovation**

Home Farm was built in 1833 on the site of the original Keele Hall. It is one of 20 “model farms” built in the 1830’s as part of the drive to feed the growing population. Model farms were designed to enable agricultural experimentation and improvement. The buildings were used until the 1980’s and became derelict. The buildings were renovated between 2009 and 2011 at a cost of around £3.5 million preserving many of the original features and incorporating new technology. Today the building features:

- 6 x 100m boreholes for ground

source heat collection

- Solar PV panels
- Solar thermal units
- Underfloor heating
- Evaporative cooling unit
- Rainwater harvesting for flushing of toilets
- Efficient toilet flushing systems to conserve water
- Efficient lighting system incorporating LEDs and sensor controls
- Sensor controlled ventilation
- Biomass heating generator
- 1 kW prototype vertical axis wind turbine
- Furniture featuring “Sting” fabric manufactured using nettles

New technologies and advances in sustainability are not only demonstrated but present opportunities for research and development. The leading collaboration with McCamley Ltd, to install and test a prototype vertical axis turbine, was a runner-up in the Sustainable Development category of the prestigious Lord Stafford Awards. During 2011 and 2012 the efficiency of the building and its waste processes was the focus of six separate dissertation projects for students on the Masters in Environmental Sustainability and Green Technology.

## **Science by Stealth**

The Earth Observatory within the Sustainability Hub is the outreach wing of the complex. It features laboratory furniture, exhibits and equipment for running outreach activities aimed at the general public and schools. The centre offers a full range of facilities and expertise in science education and how science relates to the world around us in the context of sustainability. Visitors are able to interact with facilities in the Sustainability Hub and the campus and explore the grounds as they learn. Activities are based on four main components: Hydrosphere; Atmosphere; Geosphere and; Biosphere.





# PROJECT CAMEOS



## Allotments

In the Spring of 2012 the approval was given for an allotments scheme on the University campus. Discussions had been underway about such a scheme for some time and the University's Executive Committee recognised that it fits well with Keele's Strategic Plan commitment to 'develop an environmentally aware and sustainable outward facing campus community'. More specifically, there is a commitment in the University's Environmental Policy to 'support the development of staff and student allotments to promote engagement with local food and the food life cycle'.



*The first allotment holders with the University's Chancellor Jonathon Porritt*

The site has been developed in the walled garden on campus. Historically, this area was used to grow food for the Sneyd family (the landowners at the time and resident in Keele Hall in the 19th Century), and, more latterly, to grow plants for commercial purposes. The site was originally carefully selected and designed for optimal growing conditions. However, since foundations were laid to allow the construction of greenhouses against the high back wall in the '60s, it was determined that the most effective way of using the area now was to create a series of raised beds.

Construction took place over the Summer 2012 - in spite of driving rain which at one stage left the site looking like a bog! However, there are now 10 raised beds in place which are tended by a group of allotments holders selected from amongst staff, students and the local community.

The allotments are overseen by an allotments management group who meet regularly to manage the scheme and discuss day to day practicalities. To find out more about the scheme please see:

[www.keele.ac.uk/greenkeele](http://www.keele.ac.uk/greenkeele).

## Grey Matters

Grey Matters is a membership project, funded by the Keele Key Fund (an alumni-fund), focusing on inter-generational activity and knowledge exchange featuring social, practical and learning events around the theme of sustainability. Keele University Sustainability Hub welcomed more than 50 delegates to its first Grey Matters event in November 2011 to launch a new membership project. The all-day event included an interactive talk on Sustainable Living by local, frugal-living expert Paulette Harrison, a talk on Grow Your Own, by Marcus Chilton-Jones, Curator at the Dorothy Clive Garden, and a talk on Green Technologies for the Home, by Dr Joanna Wright and Dr Sharon George (lecturers within the School of Physical and Geographical Sciences). Delegates discussed and debated key issues throughout the day which resulted in a series of Sustainability Top Tips.

The project managed by Dr Sharon George links students and older people around 3 main themes:

- Gardening
- Sustainable Living
- Changing Planet



### **Sustainable Student Bungalow**

In 2011 four students from the BSc in Environment and Sustainability programme lobbied the University for the opportunity to live in a bungalow on campus that they could turn into an 'exemplar' of sustainable student living, giving them the opportunity to 'live what they are learning' and to use the house to encourage other students to live more sustainably. The students moved into a standard bungalow on the University campus in September 2011. Throughout 2011/2012 the students have built a substantial vegetable garden with funding from the Keele Key Fund, have monitored their energy use, segregated and monitored all of their waste production, and explored collaborative consumption and behaviour in their day-to-day living. The students have disseminated the project through a blog, (<http://livegreenkeele.blogspot.co.uk>), website ([www.keele.ac.uk/livegreenkeele](http://www.keele.ac.uk/livegreenkeele)), Twitter (<http://twitter.com/livegreenkeele>) and Facebook page (<http://tinyurl.com/aopbhbb>), in addition to the Keele student magazine Concourse, and externally through The Sentinel newspaper, and Radio Stoke. The project has involved many more students than just the four living in the house. The 'housemates' estimate they have had over 100 visitors to the house, with many of them getting involved in establishing and maintaining the garden. For 2012/13 an application process was undertaken to select the new 'housemates'. Four new students have taken over the project and the running of the 'Sustainable Student Bungalow', with two students from the BSc Environment and Sustainability programme and two students from different programmes.

### **Installation of the Chancellor**

Jonathon Porritt was officially installed as the new Chancellor of Keele University at a special ceremony in the University Chapel in February 2012. He is the University's fourth Chancellor and succeeds Professor Sir David Weatherall. His installation as Chancellor was the first official event in Keele's 50th Anniversary year.

The new Chancellor told a packed audience in the University Chapel: *"This is quite a privilege for me – quite a daunting experience to be honest. This is a very heavy responsibility placed on my shoulders and a very interesting time to take up this role as the University embarks on the 50th Anniversary of its incorporation."* He said he was *"absolutely delighted and deeply honoured"* to be the Chancellor of Keele University – *"a critical part of my excitement at taking up this role is that Keele is already an exemplar in many aspects of sustainability and academic rigour, good science and the use of knowledge are an essential part of what we are doing."* Professor Nick Foskett, Vice-Chancellor of Keele University, said: *"We believe that Jonathon's appointment as Chancellor recognises and underlines our core values and ambitions. His own profile as critical thinker, as clear advocate for the values that we share, as believer in the importance of evidence-based and science-based policy and decision-making, and of course his leading commitment to the sustainability of current and future society matches closely what we uphold at Keele. We look forward to his support, to his wise counsel and to his engagement in developing and delivering our vision for Keele and its students over the coming years, as we seek to further enhance the achievements, profile, reputation and influence of Keele University."*





# A STRATEGY FOR ENVIRONMENTAL SUSTAINABILITY

The strategy is summarised at the top level through the University's Strategic Map, which identifies environment and sustainability (E&S) as one of its 6 key aims in the 2010-15 Strategic Plan:

**STRATEGIC AIM 5: *To develop an environmentally aware and sustainable outward-facing campus community***

## STRATEGIC OBJECTIVES

- ***To provide models of innovation and good practice in environmental sustainability through all our activities***
- ***To unlock the potential of the University Estate so that it underpins the attainment of our vision***
- ***To share and provide the University's expertise in environment and sustainability to local, regional, national and international communities and partners***

For these aims and objectives to be delivered, there needs to be an operational plan lying beneath this, and this has been driven forward by quarterly meetings of the Environment & Sustainability Steering Group (ESSG). This group comprises key representatives from the wide range of activities that relate to sustainability, with the theme leaders providing updates and proposing new ideas. An especially productive tactic has been to identify projects for which 'task and finish' groups could be established, which has successfully led (for example) to the implementation of a range of initiatives to support cycling (led by Huw Evans), and to the establishment of an allotments scheme (led by Andy Dobson, with Huw Evans working with Keele Students' Union on winning our Student Eats Award). During the course of the past year, there have been some important modifications to the themes covered by ESSG, to reflect better

the needs and opportunities at the University, and they now comprise:

- Student Engagement
- University Carbon Management Plan
- Renewable and Low Carbon Energy
- Estates Developments
- Waste and Recycling
- Procurement and Catering
- Sustainability in the Curriculum & Student Experience
- Research
- Outreach
- Enterprise
- Keele University Sustainability Hub
- Communications

There is obviously significant overlap between many of these topics, but the identification of theme leaders has enabled us to deliver a wide range of successes over the past 12 months. A couple of the areas are worthy of special mention. Firstly, communications are a really key issue as far as sustainability is concerned, and this is being coordinated by Ximena Canter; early in 2013, our new Web pages will be up and running, and we are working closely with students to agree the best ways to disseminate important issues on sustainability. Secondly, whilst we are delighted at the successes of the cycling initiatives, it is clear that transport issues will need to be more explicitly addressed by ESSG in the coming years.

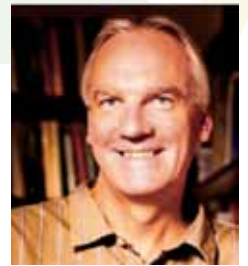
The point of this report is to enable us to recognise our achievements each year, but also to identify areas in which we need to make significantly more progress in the next 12 months. Hopefully you have found the report encouraging, inspiring and challenging.

# ENVIRONMENT AND SUSTAINABILITY STEERING GROUP



**Professor Patrick Bailey,**  
Pro Vice-Chancellor  
(Environment &  
Sustainability)

**Professor Andy Dobson,**  
Professor of  
Environmental Politics



**Luke Bellamy,**  
Think:Green (Student  
Sustainability Society)  
President

**John Downing,**  
Head of Grounds



**Carl Brindley,**  
Students' Union  
Environmental Officer

**Huw Evans,**  
Environmental Manager



**Phil Butters,**  
Director of Estates &  
Development

**Dr Sharon George,**  
Sustainability Hub  
Manager



**Ximena Canter,**  
Faculty Business  
Manager for the Faculty  
of Natural Sciences

**Dr Peter Hooper,**  
Head of Research and  
Enterprise Services



# ENVIRONMENT AND SUSTAINABILITY STEERING GROUP (CONTINUED)



**Andy Irwin,**  
Keele Postgraduate  
Association President

**Professor Peter Styles,**  
Professor of Applied and  
Environmental Geophysics



**Dr Sherilyn MacGregor,**  
Senior Lecturer in  
Environmental Politics

**Joe Turner,**  
Students' Union President



**Professor Mark Ormerod,**  
Pro Vice-Chancellor  
(Research and  
Enterprise)

## ***Other Key Contacts:***

**Martyn Wilde,**  
Energy Manager,  
Estates and Development  
Directorate

**Paul Richards,**  
Senior Operations Manager,  
Estates and Development  
Directorate

**Cathy Partington,**  
Head of Projects,  
Estates and Development  
Directorate

**Susan Warrender,**  
Head of Catering,  
Commercial and Business  
Engagement Directorate

**Linda Sutton,**  
Head of Procurement,  
Finance and IT Directorate

**Dr Joanna Wright,**  
Sustainability Hub Co-ordinator

**Dr Andy Brooks,**  
Enterprise Business Manager,  
Research & Enterprise Services

**Chris Stone,**  
Public Relations Officer



**Andy Parry,**  
Head of Operations,  
Estates and  
Development Directorate



**Dr Zoe Robinson,**  
Senior Lecturer in  
Environmental Science/  
Physical Geography



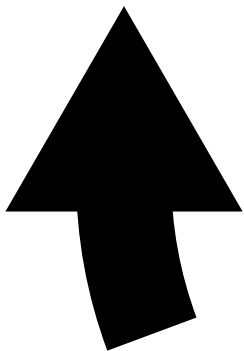
# ENVIRONMENTAL SUSTAINABILITY

## KEY FACTS

1. Sustainability is now embedded as a core theme in the Keele Distinctive Curriculum.
2. Research on Environment and Sustainability at Keele University has attracted around £5M of external funding since 2009.
3. Keele University has set an ambitious target of a 34% reduction in Carbon emissions by 2020 based on 1990 levels.
4. The University purchases 100% green electricity from renewable sources.
5. We have a range of renewable energy technologies installed on campus such as: solar thermal, biomass, ground source heat, a micro wind turbine, a solar PV array installed on the new Day Nursery and further PV installations planned within the coming year.
6. The University has been awarded the Carbon Trust standard for year-on-year reductions in carbon emissions.
7. Keele University recycled 42% of all waste generated in 2011.
8. Students can join the Keele Bicycle Users (BUG) group at <http://www.keele.ac.uk/kc/> watch out for a new bicycle hire scheme and guided trips from campus.
9. Keele University is taking part in an exciting new project with the National Union of Students (NUS) called “Student eats”. This is to help students grow their own food on campus and set-up a cooperative to sell the produce back to students and local residents.
10. Keele University holds Fairtrade status for selling and promoting Fairtrade products on campus.

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**To learn more about the University’s commitment to the environment and sustainability visit:**  
*[www.keele.ac.uk/greenkeele](http://www.keele.ac.uk/greenkeele)*



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