

Cover illustration and those used throughout this report by Matteo Farinella.  
Find out more: [www.matteofarinella.com](http://www.matteofarinella.com)



# Making an impact beyond our campus

*Professor Graham Hart is Dean of the UCL Faculty of Population Health Sciences and Chair of UCL's Environmental Sustainability Steering Group*

Universities have a unique role in society; our impacts are felt way beyond our campuses. We have the power to lead wider change in society, through our research, but also through innovation, public engagement and the graduates we help shape.

In this report, we see climate research by UCL academics achieving the "highest-scoring climate paper" in terms of news and social media coverage in 2015. Dr McGlade and Professor Ekins present a systematic approach to quantifying the amounts of fossil fuels that must stay un-burnt to prevent a 2°C rise in global temperatures. This has major international climate policy implications and is an excellent example of the global reach of our climate research.

UCL's Global Citizenship Programme takes place two weeks after the summer exams have finished.

The programme provides a range of opportunities to help UCL students boost their studies, enhance their employability and make a positive impact on the world. The rapidly-expanding programme cuts across disciplines to build on our students' academic work, and helps create a wider impact by shaping graduates with a real understanding of the complex global challenges our world faces.

Using experience of sustainable construction gained from own building projects, we're also playing a key role in a new project to drive sustainability improvements to construction across the higher education sector. Collaborating with a range of organisations, UCL is the lead academic institution working on the development of what will become a new sustainable construction and refurbishment assessment tool that is tailored to the activities and operations of

universities. The new tool, Ska HE, is currently scheduled for launch in summer of 2016.

Given all this activity, I'm not surprised that we have jumped 32 places up the independent *People and Planet University League* of environmental and ethical performance, with UCL the recipient of a 'First Class' award in 2015. Congratulations to our hard-working Environmental Sustainability Team, and all those across the UCL community who work tirelessly to ensure that UCL punches above its weight on sustainability.



# Celebrating

*Richard Jackson is Director, Sustainability at UCL. His main focus is driving forward UCL's Sustainability Strategy.*

When it comes to creating a sustainable university, collaboration, and breaking down boundaries, really is key to our success.

Much of our progress relies on collaboration between a wide range of stakeholders within UCL, and with external partners. And nowhere is this more strongly demonstrated than in UCL's Living Lab, our project to support use of the campus as a test bed for research. Through this programme, we're continuing to collaborate with students and staff to identify projects which support the aims of UCL's sustainability strategy, while contributing to the institution's research agenda. As a result of the programme, a wide range of studies using UCL's campus as a test bed for research have been undertaken, including a large number of MSc and PhD research projects.

We also continue to support a module for UCL's BAsc course involving collaboration with students, Estates, Sustainability and plumbing staff to install water meters in UCL toilets, and as you'll see in this

report, some pioneering research into the impact of lighting colour on thermal comfort that was put to the test in UCL's Engineering Front Building.

In this report, you'll also be able to read about the benefits of collaboration between students, staff and our external partners. In collaboration with charity Global Generation, students from The Bartlett's BAsc Architecture course have designed and built seven new sustainable structures in The Skip Garden, an urban garden and community space in the heart of Kings Cross. Now open to the public, The Bartlett's collaboration with Global Generation has created new areas for teaching and learning, whilst giving undergraduates experience of project management and design, as well as exposure to a real client and brief.

Thank you again, and we look forward to working together in the year ahead.

# The year in numbers:

**47** teams took part in Green Impact... **...taking 1,500** actions to improve our sustainability performance

**UCL produced 68,698** tonnes of CO<sub>2</sub>e... an increase of 1% against our 2005/6 baseline

UCL improved by **32** places in the People & Planet University League



**509,593kWh** of energy was saved during the Christmas Switch Off



Energy efficient LED lights and improved controls in the Paul O’Gorman Building have reduced the energy consumption of lighting in the building by **79%**

**We’re undertaking more sustainable construction...**

**11 BREEAM projects**  
**13 Ska projects<sup>1</sup>**

...meaning our buildings are going well beyond regulatory compliance in areas such as energy, materials, waste and water efficiency



Replacing boilers in the Darwin and Christopher Ingold Energy Centres are saving around £140,000 a year and have reduced annual CO<sub>2</sub> emissions by **690 tonnes**

**30** students received IEMA-approved environmental auditor training



1. At design stage

## CASE STUDY

UCL's logistics programme driving improvements to safety, sustainability and efficiency

*A new approach to UCL's construction logistics is helping improve UCL's carbon emissions, local air pollution and creating a safer and more pleasant campus.*

With a £1.2bn, 10 year construction programme about to start, UCL recognised that it had to take a new approach in managing deliveries on its heavily constrained Bloomsbury campus. With over 250 vehicles already entering the campus every week and over 40,000 pedestrian movements through its gates each day, the additional vehicles for this programme were predicted to bring the campus to a halt and severely impact the University's operations.

In partnership with its Logistics provider, UCL developed a new model to manage deliveries, through the use of traffic marshalls and off-campus facilities to enable the scheduling and consolidation of deliveries, deliveries onto the campus are controlled and minimised, enhancing the safety of pedestrians as well as improving efficiency.

*"This project represents the important part logistics can play in realising dramatic improvements to safety, sustainability and efficiency, not just on construction projects but across the whole of UCL's estate. We're reclaiming our campus from vehicles, creating a safer and more pleasant environment for everyone"*

- Beverley Cook, Logistics Services Delivery Manager

The use of an off-campus consolidation centre is helping reduce the number of deliveries to the Bloomsbury campus, as well as reducing vehicle mileage and emissions through consolidation and bulk buying. Previously UCL received between 1,500 and 2,000 deliveries each month. The introduction of this new approach immediately reduced this by over 500 deliveries, as non-essential trips to campus were avoided. At the peak of construction activity it's expected that most projects will realise up to 30% reduction in delivery vehicles through consolidation.





# Creating a sustainable campus

*UCL's Transformation programme continues to radically change and improve our campus. This is reflected in the large number of construction and refurbishment projects shaped by UCL's rigorous Sustainable Design Specification, ensuring the development of an increasingly sustainable estate: one of the key enablers of UCL's 2034 Strategy.*

## Energy and Carbon

During 2014-15, UCL used 256,658 MWh of energy in heating cooling, lighting and powering our equipment and campus. Generating this energy produced around 68,698 tonnes of carbon dioxide. This year, the carbon emissions associated with the energy used to power the campus (known as our Scope 1 and 2 carbon emissions), have increased by around 1% against the university's revised 2005-6 baseline of 68,160 tonnes. This revised figure now takes into account the 2005/6 carbon emissions of both the IOE and School of Pharmacy, which prior to their merger with UCL were reported separately by these institutions.

Despite the impact of several mergers and the institution's rapid growth, efficiency savings are being made across UCL's estate. These include:

- Following investigation by UCL's Engineering, Maintenance and Infrastructure Team, significant energy savings have been achieved by improving the control of the heating and cooling systems within the Darwin Building. These interventions are now saving around £96,000 and around 89 tonnes of CO<sub>2</sub> per year.

- Replacing the boilers in the Darwin and Christopher Ingold Energy Centres generating savings of around £140,000 a year and has reduced their carbon dioxide emissions by 690 tonnes annually.
- Installing energy efficient LED lighting and improved lighting controls in the Paul O’Gorman Building has reduced the energy consumption of lighting in the building by 79%, saving around 12 tonnes of CO<sub>2</sub> a year.

### Construction and refurbishment

UCL’s Sustainable Design Specification continues to have a significant influence on the environmental impacts of our construction projects by pushing the boundaries of best practice in this area. 15 construction projects are being designed and assessed using BREEAM, a globally-recognised method for certifying the sustainability credentials of buildings. Several of these are set to achieve an ‘Excellent’ rating or even higher. Meanwhile a large number of our smaller fit-out and minor works projects are being steered using the equivalent RICS SKA methodology. This year 13 projects were assessed at the design stage, receiving 9 SKA Gold and 4 SKA Silver rankings. A further 7 projects were assessed at handover stage, receiving 4 SKA Gold and 3 SKA Silver rankings. In practical terms, this means that our buildings go well beyond regulatory compliance in areas such as energy, carbon, materials, waste and water efficiency:

- The impact of our construction materials is minimised by specifying only those with high environmental ratings such as FSC timber and Green Guide A/A+ rated options.
- Our contractors are only permitted to generate very small amounts of construction waste; we are typically diverting >90% from landfill.
- The operational water consumption for our new build and major refurbishment projects will be 40% lower than the current standard rates for similar buildings.
- Efficiency improvements to our existing heating, cooling, ventilation and lighting systems are saving upwards of £150,000 a year.

### Biodiversity

UCL has continued its work with the London Wildlife Trust to create a new biodiversity ‘kit of parts toolkit’ which the Sustainability Team are using to inform construction projects which will incorporate green roofs. Up to eight green roofs are currently planned for new and existing UCL buildings over the next few years, adding to the existing ones on Gordon House, New Hall and the roof garden at the UCL IOE.

### Recycling and Waste

As part of ongoing work to improve recycling rates, a new approach to waste and recycling was introduced across the university, including hundreds of news bins and a unified waste signage scheme developed in consultation with students and Green Champions. 56% of UCL’s waste was recycled during the 2014-15 period. While there is some way to go, there are some excellent examples of best practice around the University. The Rayne Institute, 26 Bedford Way and the Institute of Child Health all recycled over 75% of their waste during 2014-15. In the last year, UCL also doubled the quantity of food recycled. Over 100 tonnes avoided contaminating other waste streams and was collected for anaerobic digestion. Quantities of hazardous waste has also gone down due to better sorting, so that less waste is treated as hazardous; a reduction of roughly 25%. Around 16 tonnes of materials were also diverted from waste streams and reused, primarily through UCL’s Warpit website.

### Food

Marking a commitment to providing healthy and sustainable food, the University’s caterer Sodexo achieved the Silver Food for Life Catering Mark at UCL. The Food for Life accreditation is awarded to food providers by the Soil Association as an independent endorsement of the quality, provenance and sustainability of the food they provide. It assesses criteria such as use of fresh ingredients, complying with national nutrition standards and meeting UK standards for animal welfare. Caterers with the Silver Catering Mark use at least 5% organic ingredients, offer healthier menus and a selection of UK or local produce.



## CASE STUDY

UCLU Green Economy Society connects students with sustainable business leaders

*Established in 2010, the student-led UCLU Green Economy Society aims to increase awareness of how businesses and policymakers can drive the transition to a more sustainable world. They offer a platform for interdisciplinary discussion of green economy issues and aim to introduce students to careers in the environmental sector.*

In the last year alone, the society has coordinated lectures, seminars and panel discussions from a wide range of guests, including industry professionals, economists, environmental consultants, campaigners and authors. They've also collaborated with the UCL Sustainability Team, delivering induction sessions to ensure that hundred more new students are exposed to sustainability as part of their introduction to UCL.

Theresa Reisch, Chair of the society explained their motivation:

*"Today's world is fundamentally shaped and framed by economics. The UCLU Green Economy Society believes that a green economy not only reduces the harmful impacts of human activities on the environment, but can foster new perspectives on how to perceive our society-environment relation. Students are the business, science and political leaders of tomorrow. It's essential that students gain awareness of the great need for a green economy, so that they can implement this knowledge and understanding in their future engagements and careers"*

Looking forward, the group aims to expand their reach and continue to raise awareness at UCL and beyond. They're collaborating on further projects with the UCL Sustainability Team, developing termly sustainability challenges designed to provoke solutions to some of the University's pressing environmental issues.



# Supporting the UCL community

*Sustainability is for everyone. And to really make an impact, it's essential that we get everyone, staff and students, on board. This year we've maintained high levels of participation in our Green Impact programme, launched an improved approach to waste and recycling across the campus and saved over 500,000 kWh of energy during our Christmas Switch Off programme.*

## Increased participation from students and staff

UCL's Green Champion network grew from 80 to 100 members in the 2014-15 period, bringing us closer to the full coverage UCL needs. Participation in UCL's Green Impact programme also increased from 44 to 47 departmental teams in 2014-15, with around 1,500 actions taken to improve purchasing, energy efficiency, sustainability literacy and recycling. 30 students also received IEMA-approved training and delivered environmental audits as part of the programme.

## Energy saving

The Christmas Switch Off saved around 200 tonnes of carbon dioxide and 509,593 kWh of energy (around a 20% reduction in UCL's usual term time electricity use and equivalent to over £45,000). The Residences' energy-saving competition Student Switch Off ran across all UCL accommodation this year, with large numbers of students taking simple actions to reduce their energy use. Total electricity use was reduced by around 3%, generating a £3,075 financial saving (assuming an energy cost of 10p/kWh). 41 students were trained as



*Students and staff creating their new biodiverse garden on the roof of the UCL Institute of Education*

cost of 10p/kWh). 41 students were trained as Student Switch Off Ambassadors and 1,065 took the Student Switch Off Climate Change Quiz as part of the programme.

### Improved recycling facilities

All UCL accommodation kitchens were audited for the use of their recycling facilities and were given feedback (and Fairtrade chocolate if they were using them to a high standard). Extensive consultation of students and Green Champions was carried in the development a new, uniform waste and recycling signage scheme for UCL. This scheme is currently being rolled-out across the campus.

### Support for active travel

Eight free student cycle tours were undertaken, led by fully-qualified instructors along a series of interesting routes, helping over a hundred students discover new routes, boost their confidence and pick up cycling safety tips. Two pop-up cycling cafes were also run on campus, providing free bike maintenance and security marking for students and staff.

### Improving biodiversity

With support from the Sustainability Team, the student-led UCL IoE garden has flourished. The UCL IoE gardens are a student-led project to create biodiverse gardens on the roof of the Grade II\* listed UCL IoE building. Established in 2013, this student-led project has now grown into two roof gardens that provide a vital resource for biodiversity and help to enhance the environment for staff, students and wildlife at UCL. During 2014-15, members of the UCL community were given the opportunity to submit their designs for one of four biodiversity-supporting raised beds in the gardens. The winners were then equipped with tools and funds to create their gardens.

### A wide range of events throughout the year

The start of the autumn term saw a week-long sustainability takeover of the North Observatory in UCL's Main Quad, with a packed schedule of introductory sessions for new students. Events included making window boxes with student allotment project Bentham's Farm, foraging tours, a clothes swap, bike maintenance and a range of talks by academics and societies. The Sustainability Team also kicked off a University-wide consultation to



# Supporting UCL's academic aims

*This year, a wide range of projects using UCL's campus as a test bed for research were carried out, including a range of MSc and PhD projects supported by the Sustainability Team. UCL's Global Citizenship Programme has continued to help increasing numbers of students to develop leadership skills in the face of complex global challenges.*

## More research projects using the campus as a Living Lab

Through our Living Lab programme, we continue to collaborate with students and staff to identify projects that support UCL's Environmental Sustainability Strategy and research agenda. As a result of the programme, a wide range of studies using UCL's campus as a test bed for research have been undertaken. Notably, the Engineering Front Building was used as a focus for groundbreaking Cisco-sponsored research exploring both the potential of the 'Internet of Things' to save energy and to create more responsive spaces. As part of joint research between Cisco and UCL's Energy Institute, this research looked into how we might perceive room temperature differently depending on how the room was illuminated. This research has found convincing data to prove the hypothesis that red light makes us feel warmer and blue light makes us feel colder (the so-called Hue-Heat-Hypothesis), showing that intelligent LED lighting could be a powerful tool to save energy in buildings.

## Increased participation in UCL's Global Citizenship Programme

The UCL Global Citizenship Programme provides a range of opportunities to help UCL students boost their studies, enhance their employability and make a positive impact on the world for two weeks after the summer exams have finished. Leading one strand of this year's programme, UCL Advances challenged students to come up with their own innovative business idea to tackle one of today's pressing social challenges. One group focused on developing a locally sustainable system of cleaning contaminated water. Their social enterprise idea, called Aquaroot, developed a bio-filtering technology utilising ferns to extract harmful substances such as arsenic from water supplies, combined with an understanding of how valuable these substances could be to other industrial markets. From 450 students in 2013-14, participating in UCL's Global Citizenship programme rose to 720 students in 2014-15.

**CASE STUDY**  
**UCL climate paper 'most featured in the media in 2015'**

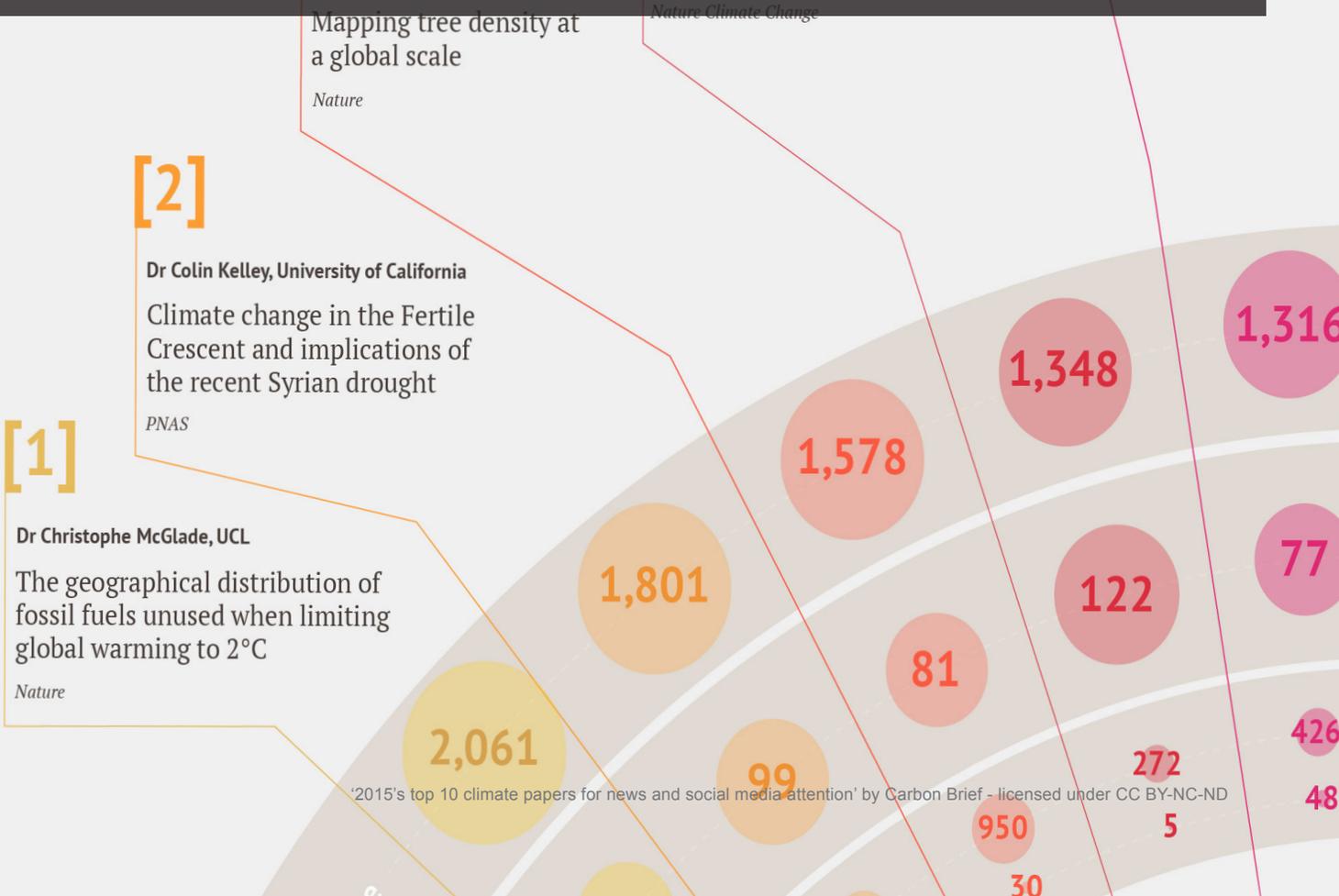
Research by UCL academics presenting a systematic approach to quantifying the amounts of fossil fuels that must stay un-burnt to prevent a 2°C rise in global temperatures was the "highest-scoring climate paper" in terms of news and social media coverage in 2015.

The article in Nature, 'The geographical distribution of fossil fuels unused when limiting global warming to two degrees' by Dr Christophe McGlade and Professor Paul Ekins outlines how preventing a 2°C rise in global temperatures requires that a third of oil reserves, half of gas reserves and over 80% of current coal reserves globally should remain in the ground and not be used before 2050, if global warming is to stay below the 2°C target agreed by world leaders at successive climate talks.

Climate policy and fact-checking website Carbon Brief conducted a study into news and social media impact of climate papers in 2015. Dr McGlade and Professor Ekins's paper was "highest-scoring climate paper" in terms of media coverage, with it featured in over 129 news stories from 76 different outlets, including the Guardian, Washington Post and New York Times.

Co-author Professor Paul Ekins OBE, Professor of Resources and Environmental Policy and Director of the UCL Institute for Sustainable Resources, said:

*"Companies spent over £430 billion in 2014 searching for and developing new fossil fuel resources. While low oil prices have now caused them to reduce these budgets, they need to rethink their exploration strategies in the context of the Paris Agreement to keep average global warming below 2°C limit, given that new discoveries cannot lead to increased aggregate production. Investors in these companies should also question their strategies. The greater global attention to climate policy means that fossil fuel companies are becoming increasingly risky for investors in terms of the delivery of long-term returns. I would expect prudent investors in energy to shift increasingly towards low-carbon energy sources."*



'2015's top 10 climate papers for news and social media attention' by Carbon Brief - licensed under CC BY-NC-ND



# Creating a wider impact

*Beyond our academic work, UCL is creating a whole range of wider positive sustainability impacts through volunteering, collaboration and the development of sector-leading tools. The pioneering Ska HE sustainable fit-out and refurbishment tool has moved closer to completion, and UCL has continued to move up the People & Planet University League, jumping from 61st to 29th place.*

## UCL moving up the People & Planet University League

During 2014-15, UCL moved up the rankings of the People & Planet University League, jumping from 61st to 29th place out of 151 UK universities. Compiled by student campaigning organisation People & Planet, the University League is an independent ranking of UK universities on their environmental and ethical performance. This year, UCL was awarded a 'First Class' award, scoring maximum points for sustainability strategy, staffing levels and engaging the university community.

High scores were also achieved in environmental management and auditing, and in efforts to tackle key impacts, such as recycling, travel and sustainable construction.

## Ska HE nearing completion

Using knowledge and experience of sustainable construction gained from its own buildings, UCL has continued to play a key role in the development of a new higher-education specific tool to drive improvements to fit-out and refurbishment projects. Reflecting the specific operations of many higher education institutions, Ska HE will act as a benchmarking and assessment method, expanding the RICS Ska tool to take into account elements like laboratories, libraries and flexibly-used spaces for teaching. Collaborating with a range of organisations, UCL is the lead academic institution working on the development of what will become a sector-leading sustainable fit-out and refurbishment assessment tool. Ska HE is currently scheduled to go live in the summer of 2016.



## CASE STUDY

Bartlett students collaborate with local charity to create sustainable structures

*In collaboration with charity Global Generation, students from The Bartlett's BAsc Architecture course designed and built seven new sustainable structures in The Skip Garden, an urban garden and community space in the heart of Kings Cross.*

Now open to the public, The Bartlett's collaboration with Global Generation aimed to create new areas for teaching and learning in the garden, whilst giving undergraduates experience of project management and design, as well as exposure to a real client and brief.

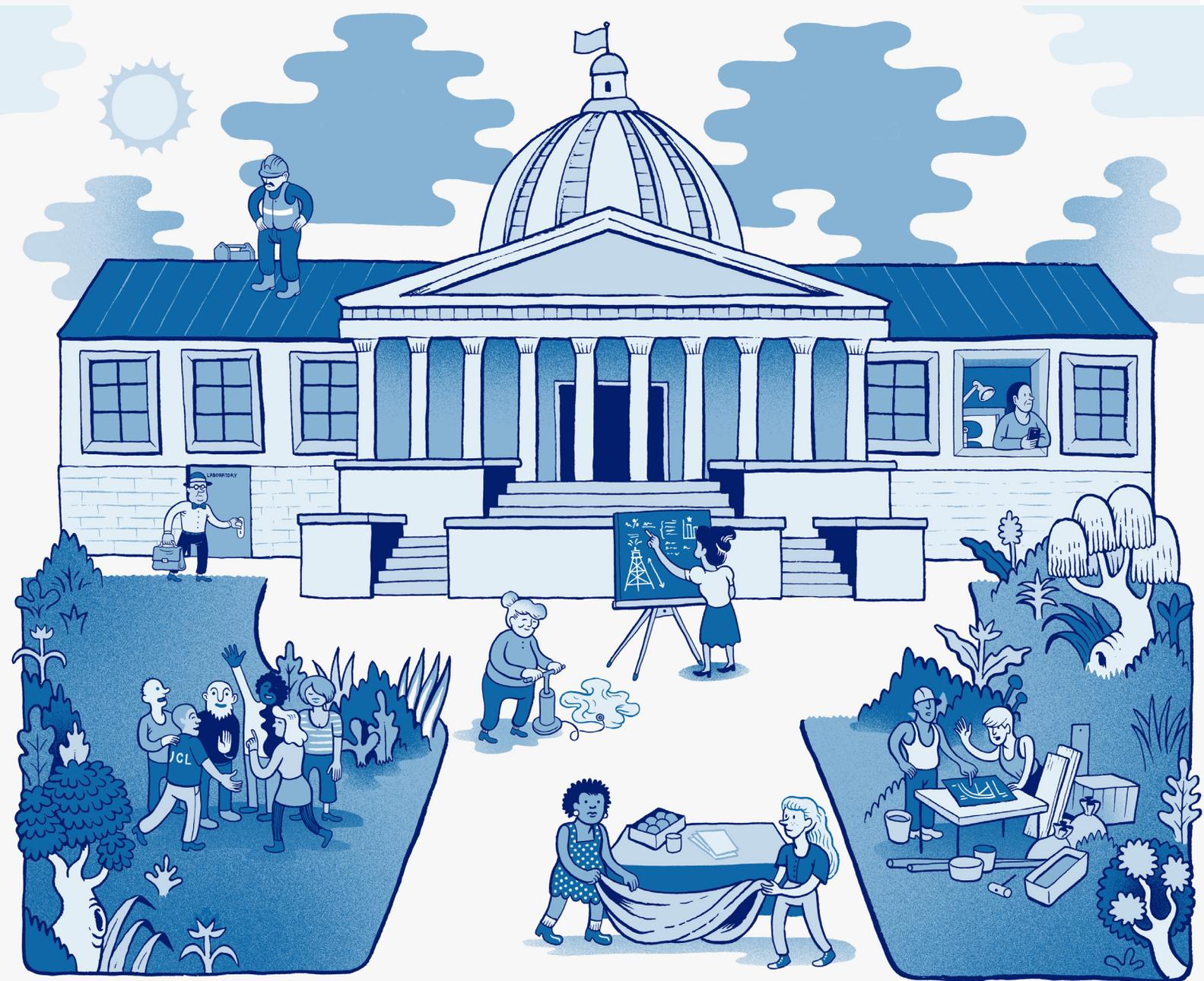
The project provoked students to embrace sustainable construction techniques and materials, many of which were reclaimed from the Kings Cross development sites surrounding the garden. Earth, dug out next to the garden was used to construct a rammed earth wall. Reclaimed scaffolding boards form the filtration beds for the greywater recycling scheme. A reclaimed shipping container serves as foundation and base for the twilight gardening space, which in turn is clad with locally reclaimed sash windows, and a produce cold store and poetry writing space is built from earth bag walls made from coffee sacks donated by a local roastery.

The collaboration between The Bartlett School of Architecture and Global Generation is the brainchild of Julia King and Jan Kattein from the Bartlett School of Architecture. Commenting on the project, Jan said:

*"Making at 1:1 scale on a real site and to a real client brief is unusual in architectural education. For us, the process became a tool for engagement, a project of 1000 hands involving engineers, safety professionals, contractors, material suppliers and volunteers from all over the country - everyone giving their time and expertise to make amazing things happen; and our students were at the centre of all these relationships.*

*Sustainability was at the heart of the project from the very beginning. We all learned about the natural cycles of the garden, the organic cafe, the urban beehives. And the students were on a personal mission to match Global Generation's agenda - which resulted in some really quite innovative design solutions."*





GREEN UCL  
UCL  
Gower Street  
London  
WC1E 6BT

green-ucl@ucl.ac.uk  
www.ucl.ac.uk/greenucl

Facebook.com/greenucl  
Twitter.com/greenucl  
Youtube.com/greenucl